

Political round table – 'Breaking Down the Barriers'

Session Co-Chairs: Professor Dominique Jolly (France; Director of International Affairs, National Assistance, Hospitals of Paris) and Professor K Schutyser (Belgium; General Secretary, Hospital Committee of the European Community)

Professor Jolly welcomed delegates and panellists to this important discussion, the aim of which was to explore the attitudes of senior representatives of governmental bodies from throughout Europe to the development of day surgery.

The 'barriers' referred to are, of course, those obstacles that continue to delay the implementation of ambulatory surgery in the face of strong arguments based both on cost and quality. Professor Jolly explained that each panellist would be asked to address briefly the following two questions posed by Dr Claude De Lathouwer (Chairman, Congress Executive Committee):

- What political and organizational measures should be taken to ensure that a nation benefits from the fact that day surgery costs less than traditional hospital-based care?
- Assuming that an effective solution to the first question can be found, what incentives are necessary to encourage hospital doctors and consumers to adapt to a new system of hospital care?

Finally, Professor Jolly requested that panellists consider a question from Mr Paul Jarrett (Director of Surgical Services, Kingston Hospital, UK) who queries what, after full discussion between government politicians and decision-makers resulting in positive reports of day surgery, will really be done to put in place the necessary infrastructure for the rapid development of day surgery.

Belgium

The first question was addressed by the opening panellist, Mr Daniel Van Daele (Secretary General, Department of Health and Social Affairs, Brussels), who pointed out that the first priority should be the use of the best possible techniques rather than cost-cutting. Standards must be maintained in the face of rapid increases in the costs of healthcare.

In Belgium, the infrastructure has not yet been created for the development of day surgery, but some developments have been made. Pilot studies have been facilitated by subsidy from the Belgian Ministry of Health, and the National Council of Hospitals has also focused on this topic to produce guidelines. Mr Van Daele stressed that the development of day surgery is dependent not only on the Public Health Department, but also on the insurance system.

In Belgium, day surgery is currently practised at three levels. Some active day facilities are physically (but not legally) separate from the main hospital unit. In other institutions, separate areas or floors of the facility are set aside for day surgery. The remainder practise day surgery, nominally or actually, within the main hospital.

Mr Van Daele supported a flexible approach to the development of day surgery rather than creating strict regulations that may be worse than no rules at all. Saving money is important, but quality of care is paramount. He also pointed to hidden costs of day surgery when looking at the overall hospital budget. There also remain patients, particularly in the older generation, who require overnight stay.

In conclusion, Mr Van Daele remains unconvinced regarding overall cost-saving issues in day surgery. Rather, he supports the other arguments for the use of this form of treatment over conventional hospital stay, namely comfort, convenience and psychological benefits to the patient.

Mr Chris Decoster (Director General, Department of Health and Social Affairs, Brussels) then answered the second question from the Belgian viewpoint.

For the purposes of reimbursement, recent changes in legislation mean that day surgery facilities now have hospital status. This removes the element of risk for those hospitals wishing to practise day surgery. The Ministry supports a positive approach to stimulate the practice of day surgery. In the short term it is hoped to increase the activity of existing day facilities, and in the medium term (1994-1996) there will be a development plan whereby hospitals will receive incentives for performing, on a day basis, those procedures in which they already specialize. By 1997, the ministry intends to have

in place the regulatory structures enabling day facilities to be treated in the same way as traditional facilities.

It is also important to encourage the medical staff, because it is they who will be overseeing these changes. This will require education to point out the benefits of day surgery. Education of the patient should also not be forgotten.

Chairman: The Chairman thanked the Belgian representatives. In recognizing that cost-benefits are not perceived by the Belgian authorities, he stressed that the important factor is that costs do not go up. Nevertheless, the fact that Belgian politicians are putting in place the statutory and financial environment for day surgery to develop is to be congratulated.

Portugal

Mr José-Luis Gil (Assistant Director General, Ministry of Health, Direction of Hospitals, Lisbon) stressed that it is necessary to have a hospital policy with the objective of creating alternatives to traditional treatment in response to the changing social environment.

The structures and resources must be made available for ambulatory surgery centres. Genuine integration between the hospital and public health is necessary to guarantee high levels of acceptance, and this can only be achieved through information, e.g. education of the citizen, and through the availability of an adequate after-care home service.

Through substitution, such alternatives to conventional care will lead to a reduction in total numbers of hospital beds and incentives must therefore be made available to both individual and institution to encourage these developments. Social and environmental aspects must also be considered, for example, transport systems and education. The goal must be to promote a new organizational and management culture in the health system and in individual units.

The physical and organizational structures must be developed to increase the capacity at ambulatory level according to the concepts of 'diagnosis', 'centre' and 'non-invasive therapy'. Implementation and diversification are interconnected with the existing system and capacity concerning the so-called 'technical plateaux'. Changes must relate to the need of the patient and the mission of the institution.

In response to the question raised by Mr Jarrett, Mr Gil firmly believes that real change will only happen with the will of both central governmental bodies and those health professionals affected by such change.

Chairman: The Chairman highlighted the question of substitution raised by Mr Gil as an issue of considerable concern among surgeons and a major cause of the resistance to be overcome.

Sweden

Mr Andes Kaarik (County Council Commissioner, Department of Health and Medical Care, Stockholm

County Council) explained that, in Sweden, different regional systems have replaced a uniform system, and each region has its own experimental systems. The system is paid for through county councils, and funding of healthcare is based on local taxation.

As in many countries, Sweden has tried to solve the major problems of rising cost and extended waiting lists. This has been attempted by restructuring in the Stockholm region to form nine districts with a central controlling body. One result has been a much improved general practitioner system. Hospitals behave as independent units and are reimbursed with prospective payments. Early results indicate increased productivity, particularly in ambulatory surgery, and almost all waiting lists have receded to less than 3 months.

Under the previous system, cost evaluation was very difficult, and more statistics are required to fully assess cost benefits of different health care options, particularly for ambulatory surgery; national statistics are useful and data on practice across Europe would be even better. In the new system, hospitals and clinics will compete for best results, and new ambulatory facilities will enhance competition.

With regard to incentives, pressures are required for any system to change. In this case, a precondition for change is a strong purchaser to exert profound economic and administrative pressures. For example, in the Stockholm model, this is the district authority.

Ultimately, the development of ambulatory surgery will rely on the use of the stick (e.g. reimbursement penalties) and the carrot (improved economic margins for outpatient procedures).

Ireland

A progressive attitude on the part of the Irish government was described by Dr Niall Tierney (Chief Medical Officer, Department of Health). He encouraged day surgery simply because it is good medical practice and a rational development of hospital medicine. His vision of the hospital of the future involves intensive treatment of a few patients and a large majority of patients being treated on a day basis or one-night basis.

The Irish politicians have already been persuaded of the cost benefits of ambulatory surgery. He quoted an increase in volume of day case surgery from 50 000 patients in 1985 to 134 000 per annum at present with a consequent reduction of 2500 beds. Some 20–25% of procedures are performed on a day basis, but there remains considerable scope for improvement.

In response to the first question, Dr Tierney does not perceive obstacles to day surgery, and there is no financial loss to professionals when switching to this form of treatment. Age is a consideration; young surgeons are more willing to perform day surgery than are their older colleagues. Recent advances in technology has done much to strengthen arguments for day surgery.

The question of incentives should be addressed both for patient and health professional. For the patient, education, information and persuasion are important.

However, the case in support of day surgery is clear and straightforward to convey. There are incentives for departments, who increasingly have budgetary control and will be able to retain savings achieved through practice of day surgery. It is important that day surgery experience is incorporated in medical training.

The statistics to support changes to delivery are currently poor, but as in Sweden, such information is now being retrieved to determine future policy.

In conclusion, Dr Tierney expressed the Department's unequivocal support for ambulatory surgery.

Chairman: The Chairman congratulated the Irish government on their clear policy in support of day surgery.

France

Dr A L'Hostis (Councillor, Ministry of Health and Human Affairs, Paris) looked at the following four major obstacles to day surgery in France:

- regulatory barriers;
- financial barriers;
- resistance within the health system;
- resistance from the patient.

Until changes in the French health law were introduced in 1991 and 1992, the regulatory and financial barriers to day surgery were overwhelming. However, changes in the reimbursement system have created the possibility of substitution and restructuring. However, the new tariffs that have been instituted apply only to the private sector. The question therefore of what developments can be made in the public system is still an open one.

Dr L'Hostis explained that resistance in the health system to change to day surgery stems from the fact that ambulatory surgery is a demanding discipline requiring considerable organization and rigorous selection criteria for patients. Motivation of health professionals will therefore require education and training. This applies not only to hospital staff but also to General Practitioners who discuss with patients the options for conventional or day treatments and are also important in follow-up.

Patients still show reticence regarding ambulatory surgery, in spite of studies demonstrating greater satisfaction of patients treated on an ambulatory rather than conventional basis. She emphasized that winning over patients will require good education and quality of at-home follow-up service.

Chairman: The Chairman pointed out the irony of a socialist government providing incentives solely to the private sector (about 30% of French hospitals).

The Netherlands

Professor A Van Montfort (Managing Director, National Hospital Institute, Utrecht) outlined two contrasting

aspects of government policy. First, there has been a desire for all parties involved in healthcare to become more market-oriented, for example, in competing for funds. Second, overall government spending has come under greater constraints. Now, there is greater competition for scarcer resources. Simultaneously, there has been a considerable increase in demand for treatment.

In response, the government has withdrawn requirements for uniform standards in day surgery. Doctors and hospitals now have responsibility for the development of day surgery and decide the extent of substitution of day beds for inpatient beds. This form of internal substitution has ensured that day facilities have emerged within hospitals rather than as 'stand alone' facilities. The government has therefore encouraged self-regulation in the growth of ambulatory surgery.

Professor Van Montfort does perceive some resistance in the medical profession and attributes this to conservatism: the way that a doctor is trained will determine the way in which he chooses to practice.

United Kingdom

Mr Mike Cummins (Administrator, Department of Health, London) pointed out that at the political level of central government in the UK, there are no obstacles to day surgery. Since 1979, the number of day case patients treated annually has nearly trebled, from 570 000 to 1.5 million in 1991–1992. Surgical day cases had in fact increased from 383 000 to 1 100 000 in the same time period. Nevertheless, there is still considerable potential for growth.

In 1990, the Audit Commission reported in *A Short Cut to Better Services* the major differences in provision of day surgery between districts. A follow-up report in 1992 outlined interim progress but still stated that 14% of districts had no dedicated day facilities.

In 1985, the Royal College of Surgeons recognized the increasing importance of this form of treatment and issued guidelines for day surgery. A target of 50% was set as the desirable proportion of elective procedures to be performed on a day basis. Approval by this senior professional body bodes well for further growth.

The Value for Money Unit of the Department of Health examined aspects of cost, organization and implementation in 1991. The potential saving, hypothesizing a doubling of day care (to 30%), would be £124 million nationally. An alternative approach would be to plough back these savings so that a greater number of patients could be treated, i.e. a reduction in unit cost but no overall saving. Mr Cummins envisages reality falling between these alternatives.

The Department of Health have found the following to be the main obstacles to growth of day surgery:

- lack of enthusiasm in some health professionals;
- lack of enthusiasm from senior managers unwilling to change working practices and invest for the future;

- unsuitability of premises and costs incurred in modifying buildings;
- lack of systems and organization
- competition for funds due to treating more patients.

The solutions lie in improvements in supply of information and in support from government. Health professionals and managers need to have information to gain the confidence to make changes. The government has so far assisted by improving information flow and providing a good environment for growth of day surgery. Central funding has also been made available; in 1992 the Department of Health provided £15 million for the

expansion of dedicated day units, and this was matched by Regional Health Authorities to provide a total of £30 million. This funding was again made available in 1993.

Mr Cummins briefly described the joint Department of Health/National Health Service 'Task Force' which has examined targets in day surgery (the 50% goal was reaffirmed), procedure and specialty targets and quality issues.

Recent health reforms have achieved an internal market within the National Health Service, which will further encourage growth as it will be responsive to cost-effective approaches.

The Annual CBO Conference on Day-Care

The Netherlands

26 November 1993

The Dutch organization for Quality Assurance in hospitals (CBO) has organized its third conference on day-care in hospitals.

The conference aims to reflect the "ins and outs" of day-care in the Netherlands and Belgium. The conference language will be Dutch. Themes for the plenary session will be key success factors for day-care and quality management in day-care. There will be parallel sessions for physicians, nurses and management and multi-disciplinary groups. In order to improve the exchange of information, all participating hospitals will be asked to make a poster presentation of the day-care unit in their hospital. The conference closing session is a consensus meeting on day-care.

The conference will interest all those involved in day-care in hospitals (professionals, managers, education, etc).

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Ambulatory microsurgical lumbar discectomy

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Microsurgical technique was used for lumbar disc herniation in 132 patients. The procedure was preferably performed under spinal block in a simple prone position. In the first series 68 patients left the hospital 3 days postoperatively while in the second series 64 patients were treated ambulant. Based on self-rating, 87% of the patients expressed an excellent or good result of the operation. A higher rate, 96%, was obtained for patients operated on within 6 months from the onset of symptoms. No complications were encountered due to the ambulation and the patients were satisfied with the early discharge from hospital which may facilitate an earlier return to normal activity.

Key words: Lumbar disc herniation, lumbar discectomy, ambulatory lumbar discectomy

Introduction

After routine laminectomy for lumbar disc herniation patients usually need several postoperative days of care in hospital. At the beginning of this study patients were routinely kept in hospital for 3 days postoperatively. Later due to shortages in the number of beds, the need for an ambulatory surgery approach was called for. The aim of this prospective study was to measure the results of surgery, the intra- and postoperative morbidity and the patients' satisfaction with their treatment.

Methods

Patients

Except for 13 patients with acute cauda equina syndrome all had gone through a long period of conservative treatment for at least 12 weeks. Only patients with more leg pain than back pain were considered for operation. Further inclusion criteria were a positive straight leg raising test and at least one of myotomal, dermatomal or reflex deficit. CT scans were available for 125 patients and a myelogram in seven patients. All patients were offered a rehabilitation programme with a back school 3 weeks postoperatively before return to work.

Surgery

The microsurgical technique, with minimal disc excision as described by Caspar¹ and Wilson^{2,3}, was used in all of the 132 consecutive patients. All operations were performed by one orthopaedic spinal surgeon (the author). Based upon the clinical and radiological findings strictly monosegmental surgery was performed. Not more than one single segment was explored in all patients. The correct interspace was identified under an image intensifier and checked if necessary during the operation. Eighty-six per cent of the patients exhibited extruded fragments. Extraforaminal fragments occurred in 4% and were operated with a paramedian approach with the same microsurgical technique⁴. The simple prone position did not decrease the range of the operation field much and laminotomy was necessary only in cases of large upwards or downwards entrapped fragments. Decompression with medial facetectomy and foraminotomy was performed in 24 cases of concomitant lateral stenosis. In the beginning of the study a special frame was used to decrease abdominal pressure. The last 64 patients however were lying in a simple prone position on the operating table and no attempt was made to decrease the abdominal pressure. Before closing the wound a free fat graft was placed on the dura as a seal.

Anaesthesia

Spinal block was used in 87, local anaesthesia in 28 and general anaesthesia in 17 operations (Table 1). For local anaesthesia, with the aid of an image intensifier, bupivacain with adrenaline was injected subcutaneously and

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Table 1. Form of anaesthesia in the series of 132 patients

General	17
Spinal	87
Local	28

Table 2. Intra- and postoperative complications in the whole series of 132 patients

Neurological	0
Wound infection	0
Discitis	1
Dural tears	4
Spinal headache	0

without adrenaline into the ligamentum flavum. A small volume deposited just under the ligament often gave a block deep enough for the whole procedure. On demand xylocain spinal was given intrathecally with a 26-gauge needle during the operation. Patients were allowed to walk freely a few hours after the operation.

Review

All patients were followed a clinical examination 1 and 3 months postoperatively. They also filled in a questionnaire about intraoperative and postoperative morbidity using a visual analogue scale (VAS). The recurrence rate after 3 yrs was calculated from the records of all the patients.

Results

An excellent or good result (no or minor back pain or leg pain, no medication needed) was obtained in 87% of the patients. Ninety-seven per cent of the patients operated on within 6 months from the onset of symptoms exhibited excellent or good results compared to 77% for those operated on later (Figure 1).

Complications

No neurologic injury was observed (Table 2). Minor dural tears occurred in four operations in the beginning of the series. One case of discitis was treated with antibiotics and eventually resolved with a good result. Spinal headache did not occur in any of the patients given spinal anaesthesia.

Morbidity

In the beginning of the study the intraoperative blood loss was on the average 120 cc (0–400 cc). The simple prone position did not increase bleeding compared to the special frame used or the kneeling position. On the contrary, blood loss decreased (in the last 64 patients) to an average of 10 cc (0–50 cc). Ninety-seven per cent of the patients (Figure 2) found the operation easy and painless (VAS 0–4). No difference was found for general or local anaesthesia. Ninety per cent of the patients scored low values (VAS 0–4) of postoperative back pain (Figure 3).

Hospital stay

At the beginning of the study 68 patients were discharged routinely from hospital on the third postoperative day. The following 64 patients were treated ambulanty (Table 3). Patients were observed in the recovery room 8 h before discharge. The surgeon checked that they had full control over walking and voiding. Next day a telephone call from the surgeon was able to solve minor practical problems. Only if the hospital was very far from the patient's home or if the operation was postponed to late in the afternoon, was the patient kept overnight at the postoperative care unit. The ambulatory patients were satisfied with the early discharge from hospital (86% VAS 0–2), not significantly different from the response given by the in-hospital group of patients (Figure 4).

Recurrence rate

At review after a minimum of 3 yrs postoperatively six patients (4.5%) have been operated on for recurrent disc

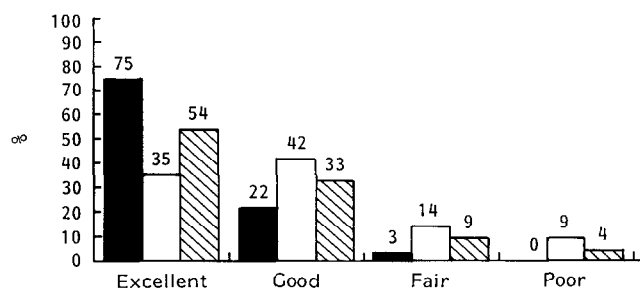


Figure 1. Results of the whole series of 132 patients. The 63 patients operated on within 6 months did much better than the 69 operated on later. ■ 0–6 months; ▨ 6+ months; ▩ total.

Table 3. Ambulation or in-hospital treatment for the series of 132 patients

Same day	36
Overnight	28
Weekend	68

herniation, all at the same level and side as the earlier operation. The same microsurgical technique was used with excellent result in all cases. The free fat pad deposited at the first operation was found viable with an intact dural sheet beneath.

Discussion

In previous reports it is claimed that the overall satisfactory results of microsurgical discectomy of 88–98% is not much higher than those for standard laminectomy, 40–98%^{3,5-12}. It seems that the advantages of the microsurgical technique are mainly less postoperative morbidity and earlier return to normal activity^{3,5,8}; the most important result also in the present study. Only 48% of the patients in this study were referred to a specialist within 6 months from the onset of symptoms. A much higher success rate of 97% was obtained for these patients than for those operated on later. Weber¹³ found a significantly worse outcome in patients with sick leave

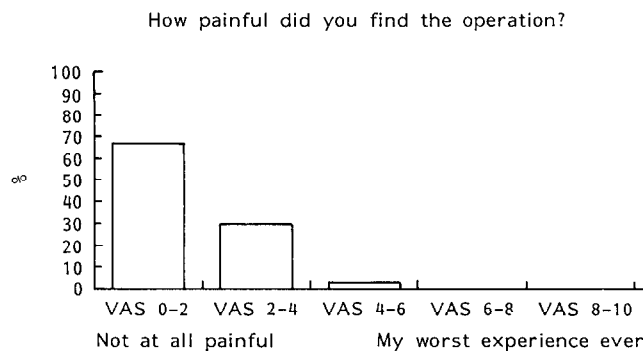


Figure 2. Self-estimation of patients operated on under spinal or local anaesthesia. Results are given by VAS in % of the group of 115 patients.

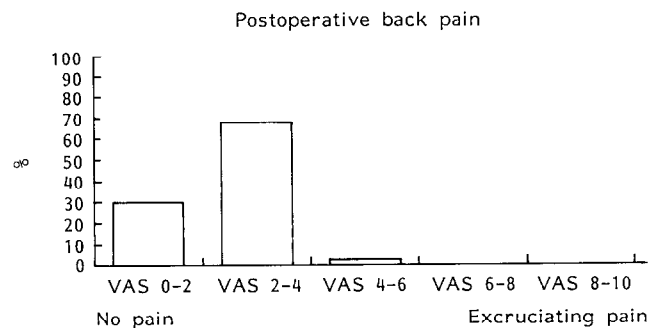


Figure 3. Self-estimation from all the patients in the series operated on with the microsurgical technique. Results are given by VAS in % of the whole group of 132 patients.

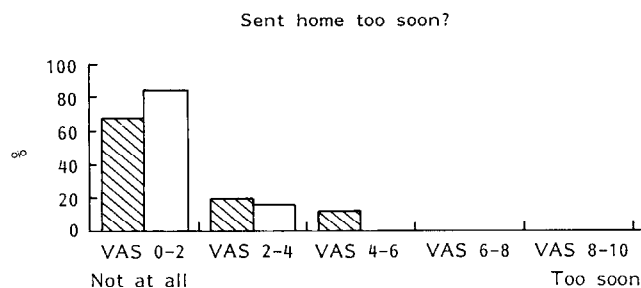


Figure 4. Self-estimation from 68 in-hospital and 64 ambulatory treated patients. Results given by VAS in % of each group of patients did not indicate any dissatisfaction with the ambulatory procedure. ▨ Hospital care; □ ambulatory.

of more than 3 months compared to patients with a shorter sick leave. One of the arguments against microdiscectomy has been an alleged higher rate of infection. This was true for the first reports of a new microsurgical technique^{2,6}. In the present study, however, as in many other more recent studies, the infection rate and the overall complication rate was lower than that reported for conventional surgery¹³⁻¹⁹. The recurrence rate after discectomy is generally around 4% after microsurgery as well as after standard laminectomy^{7,11,15,20,21}. After removing only the extruded fragment a recurrence rate of 9-21% has been found²²⁻²⁵. Subtotal removal of the disc, as in our study, gave a recurrence rate of about 4%^{2,11}. In studies with standard laminectomy the kneeling position has been shown to decrease bleeding²⁶. Bleeding was not increased by the simple prone position used in this study. As a matter of fact in the second part of the present study (64 patients) there was usually no bleeding at all. This was certainly a result of the learning curve of the surgeon and may also have contributed to a decreased operating time and complication rate^{11,13,26}. Patients found the surgical procedure quite simple and painless. Only a few years ago in our clinic patients needed 10 postoperative hospital days after laminectomy. The introduction of the microsurgical technique first led to a decrease to 3 days, and later made the ambulatory procedure possible. In general, postoperative hospital stay is 7 days after laminectomy and 2-3 days after microsurgery^{3,5,8,11,15,19,25,27,28}.

Cares³⁰ reported about 10 cases of ambulatory microsurgical discectomy. His most striking observation was that patients were back to work 3-14 days postoperatively. The ambulatory procedure in lumbar discectomy has up to now not been routine. When questioned, patients generally prefer ambulatory care rather than a hospital stay. In the hands of a well experienced spine surgeon this procedure may decrease the necessity of inpatient postoperative care and facilitate an earlier return to normal activity.

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Day surgery: a problem of economics or financial management?

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Day surgery is often cited as a means of reducing expenditure on health care or increasing surgical activity within a given budget, whilst at the same time maintaining or improving the quality of care offered to patients. The aims of this paper are to explore the validity of this claim and to look at the issues involved in putting it into practice. The main conclusions are that day surgery is much better value for money than inpatient surgery, but there is no guarantee that savings will be made in every case. The main problem is one of sound financial management of change rather than economics. It is necessary to: (i) agree clear targets with surgeons and monitor them; (ii) ensure that the potential for day surgery is being maximized by monitoring the characteristics of patients having inpatient surgical procedures which are suitable for day surgery; and (iii) give surgeons greater control over their own budgets so that they can see the benefits of improved efficiency.

Key words: Day surgery, economics, financial management

Introduction

Day surgery is often cited as a means of reducing expenditure on health care or increasing surgical activity within a given budget, whilst at the same time maintaining or improving the quality of care offered to patients. The aims of this paper are to explore the validity of this claim and to look at the issues involved in putting it into practice.

The paper is divided into four main sections which seek to address the following questions:

1. How should we measure the relative costs of day and inpatient surgery?
2. What are the results of comparisons from the literature?
3. What are the economics of bringing about a shift from inpatient to day surgery?
4. How should this change work in practice?

The relative costs of day and inpatient surgery

There are three important principles which should underlie measurement of the relative costs of day and inpatient surgery:

Compare like with like

This means looking at similar surgical procedures rather than the work of whole specialties or hospitals which will reflect differences in case mix; and comparing similar patients, because differences in age and health status are particularly important in affecting costs. Many studies reported in the literature and those carried out by individual hospitals often do not compare costs in these ways.

Include all the relevant costs

The direct costs incurred by the hospital are the most obvious and consist of the costs of the surgery itself, nursing costs and hotel costs. These are the easiest to measure and most often included in the studies. But there are also what we might call transferred costs. These include community support costs and the associated costs incurred by individual patients, their families and employers. Many studies do not take these into account.

Look for differences in costs other than the obvious ones which relate to length of stay

For example, a day surgery operation could be carried out in a day surgery operating theatre attached to a day surgery unit, which may be cheaper to run than a theatre suite in a large hospital used for inpatients. Differences like this should be reflected in the costs, yet there have been few studies of the cost differences of providing day surgery in different settings. Another example is where the unit cost of nursing may be less in day surgery units

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Table 1. Studies of the average costs of day surgery compared to inpatient surgery

<i>Study</i>	<i>Date</i>	<i>Procedures included</i>	<i>Costs included</i>	<i>Method of calculation of costs</i>	<i>Difference as % of inpatient cost</i>
Babson ¹	1977	Hernia, varicose veins	Hospital, home nursing	Individual patients	40–44
Prescott ²	1978	Hernia, varicose veins	Hospital, home nursing	Individual patients	65
Evans & Robinson ³	1980	Many paediatric	Hospital	Costs of day and inpatient facilities	70
Coe ⁴	1981	Hernia	Charges to patients	Bills paid by private patients	65
Flanagan & Bascom ⁵	1981	Hernia	Charges to patients	Bills paid by private patients	70
Rockwell ⁶	1982	Hernia	Charges to patients	Bills paid by private patients	45
Pineault et al. ⁷	1985	Hernia, tubal ligation	Hospital, home nursing, patient out-of-pocket expenses and loss of salary	Individual patients	19–26
Heath et al. ⁸	1990	Laparoscopy, arthroscopy and cystoscopy	Hospital	Costs of day and inpatient facilities	49–68

because the work of nurses may be more routine and require fewer nurses per patient. This is in addition to the fact that day surgery requires less nursing time overall.

Evidence from the studies which have been carried out

There have been a number of studies which have looked at the differences in the average costs of day and inpatient surgery (Table 1). The first studies were carried out during the 1970s and concentrated on the hospital and home nursing costs. The inclusion of home nursing costs reflects the way in which the services were organized at the time. There is evidence that for many routine day surgery procedures these transferred costs are small⁹ because community follow-up is not needed. But as the scope of day surgery broadens and the procedures which are appropriate become more complex, there may be a greater need for community support.

The studies based simply on charges to patients are probably the least reliable as they reflect possible differences in the type of patients having each type of surgery as well as differences in the nature of the surgery. More recent studies have incorporated some of the transferred

costs, like the out-of-pocket expenses of patients and the costs to employers and employees.

Despite having looked at different surgical procedures, included different categories of costs, used different methods for calculating the cost differences, all over several years when surgical practices have been changing, the overwhelming conclusion from these studies is that day surgery has much lower average costs. Even the study by Pineault et al.⁷, which included community and personal costs to the patient, found day surgery to be 25% cheaper than equivalent inpatient surgery. So the case is very clear.

The economics of change from inpatient to day surgery

It would be convenient if we could say that changing from inpatient to day surgery will result in expenditure savings of 25% or more. Unfortunately, it is not that simple. Figure 1 shows two graphs, one for day cases on the left and one for inpatients on the right. Each shows the number of patients treated on the horizontal axis and the average cost of treatment on the vertical axis. The lines show that average costs fall as the numbers of patients increases because the overheads are spread more

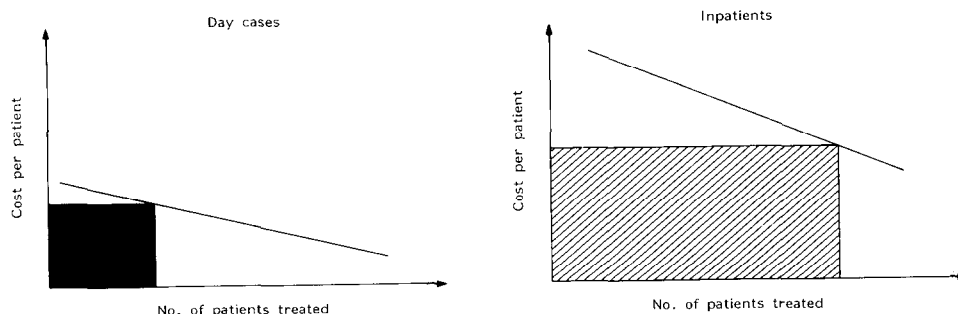


Figure 1. Expenditure on day and inpatient surgery. ■ = Day cases; ▨ = inpatients.

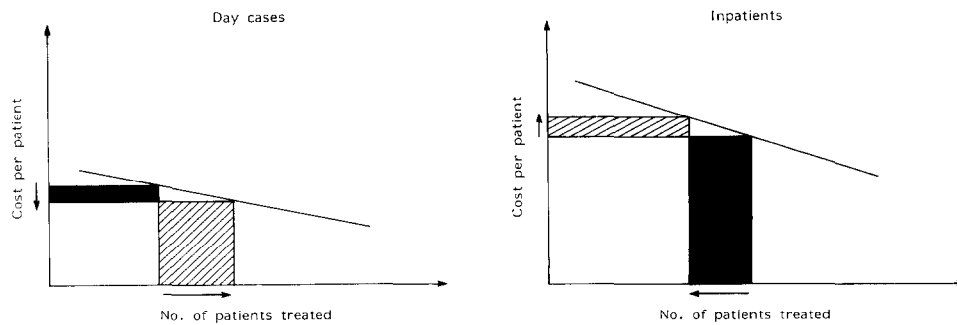


Figure 2. The costs and benefits of substituting day for inpatient surgery. ▨ = Extra cost; ■ = savings.

thinly and fewer staff per patient may be needed. The average cost of day surgery is clearly less than that of inpatient surgery assuming the vertical scales are the same. If we multiply the number of patients by the average costs in each case we get the total expenditure, shown by the shaded areas.

Now consider what happens if we try to shift inpatients to day surgery (Figure 2). The graph on the right of Figure 2 shows that the total cost of treating inpatients falls, the solid area, but the average cost of, and thus the total expenditure on, treating the remaining inpatients, rises (hatched area). The graph on the left of Figure 2 shows that it costs us more in total to treat those day surgery patients who would have otherwise had inpatient surgery (the hatched area), but the average cost falls so there are some savings (the solid area). To achieve savings overall the hatched areas must be larger than the solid areas in Figure 2. This depends on the shape and slope of the lines.

In order to measure the net effect in practice we do not need to estimate the lines or calculate the shaded areas. That would be very complex and unnecessary. For example, there is not much point estimating the costs of the operating theatre or of the patient travelling to the hospital if these are the same for both inpatient and day surgery. Instead, we can focus on the changes which are likely to take place and cost these. This is far less complex than estimating the individual average costs and is what is meant by marginal or incremental costing. This approach was used in the study carried out by the Audit Commission⁹. It was assumed that the bulk of the savings in hospital costs would be in nursing and hotel costs. This gave us an estimated saving of £110 per patient having day surgery rather than inpatient surgery at 1990 prices. A conservative estimate of the likely numbers of patients involved suggested savings of about £10m nationally. But the potential could be twice that or more. This may not sound much in the context of a budget for the National Health Service of over £20 000m per year, but the resources released could have been used to treat an additional 98 000 day surgery patients, 10% of the waiting list at the time. The Commission estimated that in fact there was a potential for reducing waiting lists by a third from expanding day surgery financed from efficiency improvements.

The marginal costing approach makes it clear that

greater efficiency as a result of day surgery will only be achieved if the inpatient services are reduced (i.e. there are real cash savings) or more patients are treated for the same total expenditure. Much depends on tight financial controls.

The importance of sound financial management

Even if the economics of a change to day surgery have been properly measured and look favourable, that change cannot happen overnight. It requires careful management. The key issue is the provision of financial incentives for change. In the USA there is a system for reimbursement of hospital costs which is used by Medicare and many of the private insurance companies. They stipulate that for certain surgical procedures and categories of patient, reimbursement will be based on the day surgery cost whether the surgery is performed as an inpatient or a day case. The financial incentive associated with this approach is a very clear thrust towards day surgery. But to make it work within the hospitals, to ensure that clinical practices follow a pattern in line with the available funds, requires equally sound financial control on the part of hospital managers. There are three important steps which can be taken to achieve this:

1. Agree clear guidelines with surgeons on the number and percentage of patients to be treated as day cases for each separate procedure over a given time period and monitor these.
2. Ensure that the potential for day surgery is being maximized by monitoring the characteristics of patients who are still having day surgery procedures carried out as inpatients. The majority of patients will be suitable for day surgery, but a few may have mitigating health problems which necessitate inpatient surgery. It is important to ensure that these are the patients who are still being treated as inpatients, not those who could have had day surgery.
3. Give staff greater control over their individual budgets so that they have some say in what happens to the benefits of improved efficiency. This does not mean that all the financial benefits should be ploughed back into surgical services, but some of them should. This is an important incentive which is often overlooked. It gives staff the opportunity to see

the benefits directly and may feed into further expansion of day surgery.

Acknowledgements

The author is grateful to Brendan Devlin for identifying some of the studies given in Table 1 and to the Royal College of Surgeons of England for permission to reproduce material which has already appeared in their 'Guidelines for Day Case Surgery', London 1992. The views expressed in this paper are those of the author. They do not necessarily represent the views of the Audit Commission.

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Ambulatory surgery in the UK

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Ambulatory surgery use varies greatly within the UK, because of differences in the level of facilities, the attitudes of surgeons, and the quality of management. Yet evidence from patients suggests they are content with this form of treatment. Together with commitment from the government and professional bodies, this suggests that the use of ambulatory surgery will grow rapidly in the UK.

Key words: Ambulatory surgery, variation, future growth

Current activity levels in the UK

In 1991, the Audit Commission, which is the organization that audits all National Health Service hospitals, conducted a study of ambulatory surgery. A 'basket' of 20 procedures known to be suitable for ambulatory surgery in many cases was selected, and then the actual use of ambulatory surgery was measured for each of them. Overall rates, either for all surgery or for whole surgical specialities are not quoted, since such rates are significantly affected by case-mix and add very little value to this study. So, thankfully, it will never be possible to create the European Ambulatory Surgery Rate Mechanism. It was found that for all the procedures looked at there was considerable variation between districts or hospitals in their use of ambulatory surgery (Figure 1). This variation was not due to differences in the ages of

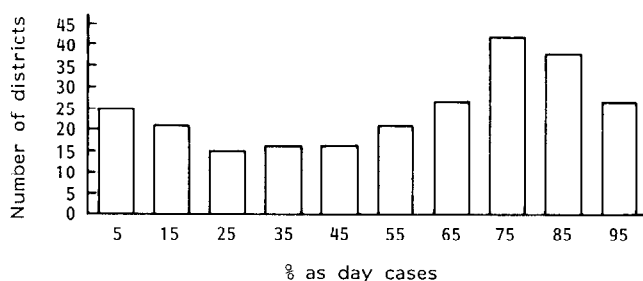


Figure 1. Percentage of myringotomies (with or without the insertion of grommets) carried out as day cases (all ages).

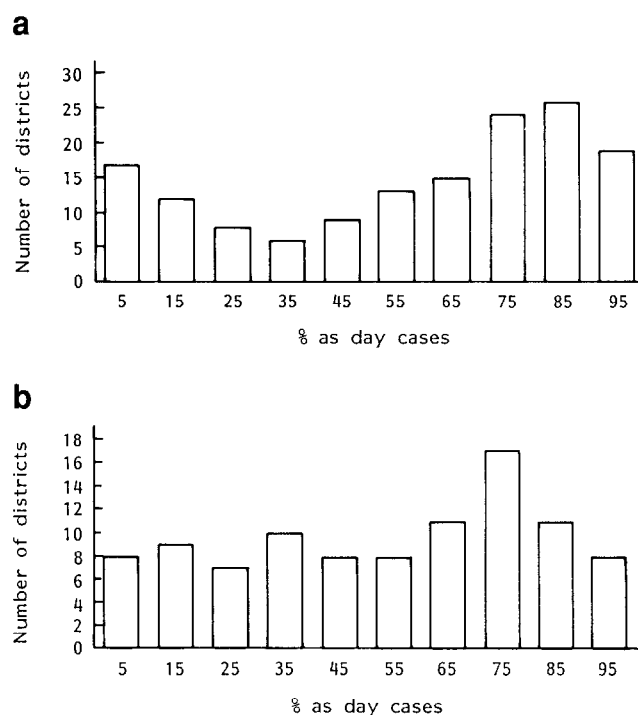


Figure 2. Percentage of myringotomies (with or without the insertion of grommets) carried out as day cases split by age: a, 0-15 yr; b, 16-64 yr.

patients, and persisted even if individual age groups are studied (Figure 2).

Causes of variation

The most obvious cause of such variation would be whether or not the hospital possessed a specialized ambulatory surgery unit. In the UK about 75% of hospitals now have such units and about half of these have dedicated operating theatres (Figure 3). Most of the

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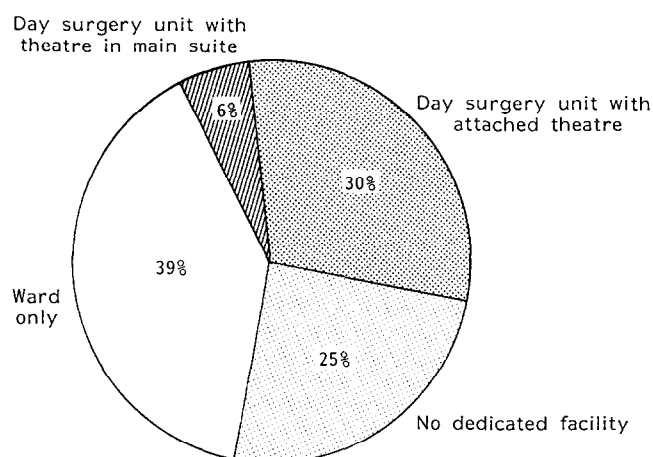


Figure 3. Ambulatory surgery facilities in UK hospitals, $n = 173$.

hospitals with the highest rates of ambulatory surgery do have dedicated units, but there are also many hospitals with units that do not have high rates. In other words, a dedicated ambulatory surgery unit is necessary, but not the only condition for obtaining high ambulatory surgery rates. It should be noted that in the UK the units are situated on the sites of major acute hospitals, even though they may be housed in separate buildings.

What is the reason for this residual variation? Obviously the attitudes and practices of individual surgeons play a major part and our evidence supported this. There is also evidence from separate research that surgeons' attitudes to ambulatory surgery are strongly dependent on their age. For example, in one study of surgeons who qualified before 1969, only 48% had a positive attitude towards ambulatory surgery, whereas for those who had qualified since 1969, the figure was 68%¹.

The incidence of ambulatory surgery does not simply depend upon having a dedicated unit, but also on how well that unit is run. Evidence in the UK shows that many units are only working at a fraction of their full potential, which was judged to be about 400 cases per year. The reasons for this, apart from the surgeons' attitudes which have already been mentioned, seem to be whether there is an operating theatre attached to the unit, whether there is someone clearly in managerial control of the unit, whether it has clear operational policies, and whether it has a high non-attendance rate amongst its patients.

Attitudes of patients in the UK to ambulatory surgery

The Audit Commission has sponsored the use of a questionnaire for measuring patient satisfaction with various aspects of ambulatory surgery. Analysis of the results has yielded interesting findings. For example, most patients when asked, said that they would be happy to have ambulatory surgery on a subsequent occasion, but the proportion who said this decreased considerably from those who experienced no postoperative pain to those

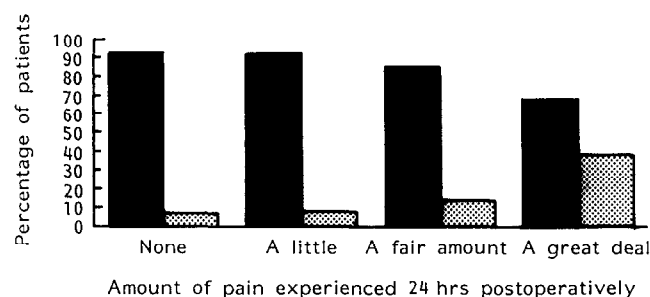


Figure 4. Percentage of patients who would be willing to undergo ambulatory surgery on a subsequent occasion, by pain category. ■ = Day case; ▨ = inpatient.

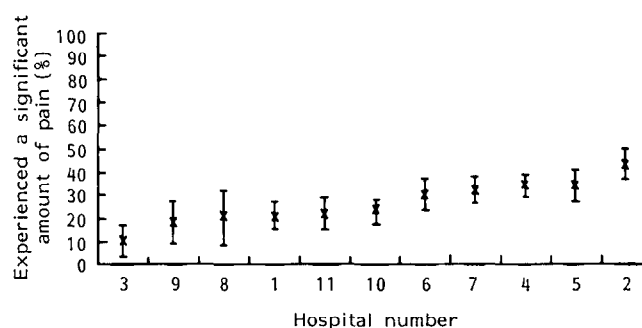


Figure 5. Proportion of patients experiencing a significant amount of pain in the first 24 h postoperatively. \bar{x} = 95% confidence limits.

who experienced a great deal (Figure 4). There are significant variations between hospitals regarding patients' experiences. Figure 5 shows the proportion of patients experiencing a significant amount of pain in the first 24 hours postoperatively, together with 95% confidence intervals for 11 hospitals.

The role of the professions and the government

The Royal College of Surgeons of England has taken a firm lead in encouraging greater use of ambulatory surgery, by publishing documents which list suitable procedures and contain good practical advice. The government in its role as purchaser of health care is clearly interested in the use of ambulatory surgery and has made investment funds available specifically for ambulatory surgery. It has also set up a task force which offers help to hospitals in areas such as definition of data, training of staff and measurement of quality. Some of the bodies which purchase health care locally are starting to specify certain levels of ambulatory surgery in their contracts with hospitals.

The future of ambulatory surgery in the UK

In conclusion, the future of ambulatory surgery in the UK looks promising. On the one hand there is an

increased drive on the part of the government and its agents, due mainly but not entirely, to the perceived lower costs. And on the other hand there is an increased use of ambulatory surgery by professionals, who are fascinated by the technological challenges and are coming under pressure from patients, more and more of whom are demanding such care. Thus we have a

common purpose between the government and the professions, a rare but happy event in the field of health care.

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BUTTERWORTH
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Study of the limits of local anaesthesia in one-day surgery in the case of 1500 strippings of the great saphenous vein

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An evaluative study over five years and 1500 great saphenous vein strippings under local anaesthesia in ambulatory surgery shows that today all these operations can be carried out under local anaesthesia (by femoral block and injection of lidocaine). Ninety per cent can be carried out in one-day surgery on condition that postoperative pain is reduced by using certain techniques (invagination stripping, phlebectomy with Muller hook), that operative risks (especially thromboembolic) are reduced, and that postoperative care at home is facilitated. Factors limiting ambulatory surgery are those of environment and the seriousness of the varicose veins.

Key words: One-day surgery, great saphenous vein, local anaesthesia, stripping

After five years' experience and 1500 operations on varicose veins involving strippings of the great saphenous vein in one-day surgery, we were interested to know the limits of local anaesthesia and ambulatory surgery for this operation.

Materials and methods

The study covers a five-year period, from 1988 to 1992, divided into five equal parts. The operation was performed in the same clinic and in the same way and all the patients were seen at least 21 days after the operation. All patients had idiopathic varicose veins.

Description of the technique

The operation consists of: a crossectomy with dissection of the femoral vein by a 4-cm incision in the pubic triangle above and inside the inguinal fold; access to the great saphenous vein below the lower side of the malleolus by an incision of 5 or 10 mm; stripping by downward invagination; where necessary, a short saphenous vein crossectomy and short saphenous vein stripping by invagination; superficial phlebectomies, using the Muller hook with complete ablation of the varicose network (saphenous branches and perforating veins), with incisions of 1 to 2 mm (average number of incisions per

operation is 30). Intradermic thread (Polyglactine) is used for the sutures, at the top and the bottom of the stripping; the knot is inside. A continuous aspiration drain is placed the length of the stripping during the operation. The operation lasts about 1 hour.

The bandage is in two parts: first a fixed elastic bandage is put on for 5 days, necessary for the decubitus position; secondly, a removable elastic bandage is put on over this, when standing or walking. The dressing and the steri strips are removed at home by a nurse.

The anaesthesia is prepared before the operation. Preoperative medication is given on request with 25–150 mg hydroxyzine. A femoral block with neurological research by electrostimulation is carried out by injection of lidocaine 1% with or without adrenaline. Electrostimulation not only locates the main branch of the common trunk but also the sensitive branches of the femoral nerve: internal and medial femorocutaneous nerve, by subcutaneous fasciculations and the areas of paraesthesia felt by the patient. This helps to increase the precision of the femoral block. The volume of the injection is 5–10 ml. Complementary injections necessary for cutaneous anaesthesia above the limits of the femoral block are carried out with lidocaine, diluted to 0.75 or 0.5 with bicarbonate. We do not carry out a sciatic block, because this induces vasoplegia which makes the operation less precise. Vasoplegia rarely occurs with a femoral block. An injection of 1–5 mg of midazolam and 0.5–1.5 mg of alfentanil is given during the operation, depending on the psychological state of the patient.

The anaesthesia is prepared 30 min to 1 h before the

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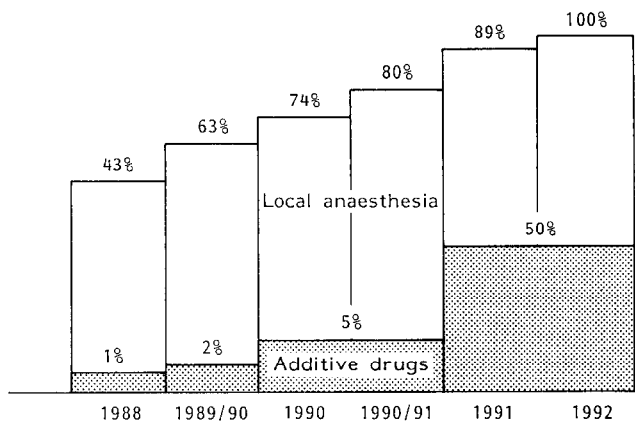


Figure 1. Percentage of long stripping of the great saphenous vein under local anaesthesia.

operation. The average volume of local anaesthesia per operation is 44 ml. The patient is treated for 8 days with low molecular weight heparine.

Limits of local anaesthesia

Since 1988 the percentage of operations carried out under local anaesthesia has increased steadily; from 43% in 1988, it is now 90% in the last two years (see Figure 1). This means that there is, at the moment, no contraindication to local anaesthesia.

We use only on average 44 ml of local anaesthesia for a complete operation, thus leaving a high margin for complementary injections which increase the anaesthetized surface, necessary, for instance, in patients with large numbers of varicose veins, requiring up to 130 incisions for a complete operation.

Obesity is not an obstacle to local anaesthesia. We have operated on patients weighing up to 160 kg. Minimal postoperative bleeding and the mobility of the patient facilitate the operation.

We have also carried out strippings of the great and short saphenous veins simultaneously in 6% of cases.

We strongly encourage patients to choose local anaesthesia as we are convinced that it ameliorates the surgical results. In 50% of cases we now inject additive anxiolytic drugs¹. This 50% certainly represents the percentage of patients who would not have spontaneously chosen local anaesthesia.

Limits of ambulatory surgery

The percentage of operations under local anaesthesia in one-day surgery is increasing regularly. In 1988 it was 73% and for the last two years it has been 90% (see Figure 2). Of the remaining 10% of patients who did not undergo one-day surgery, it can be seen that 50% were patients who would not or could not be operated on in ambulatory conditions for medical reasons: diabetes, anti-coagulant treatment, patient currently hospitalized, intercurrent disease; or for non-medical reasons: comfort, psychological problems, no help at home, transport problems, bad weather, or liv-

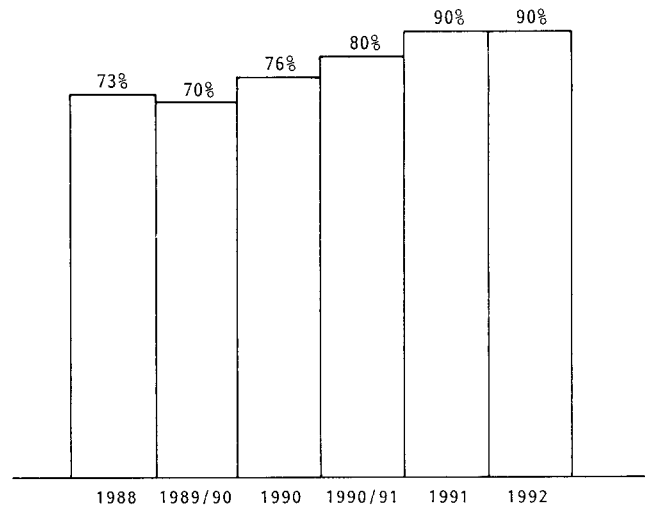


Figure 2. Percentage of long stripping of the great saphenous vein under local anaesthesia in one-day surgery.

ing too far away. In fact, only 5% of patients were actually unable to have one-day surgery. These were often elderly patients with extensive varicose veins (more than 40 incisions), with subcutaneous lesions, varicose ulcer scars, and those where the operation was carried out too late in the day to enable them to return home.

The femoral block lasts 3–6 h. On three occasions, the block lasted more than 12 h. Only two patients have had operative incidents prohibiting their return home: one had a seizure during the femoral block and one had immediate postoperative bleeding from the crossectomy incision (external pudendal artery).

The rare consultations made during the first post-operative days have always been for problems related to the dressings or for haematomas of the upper part of the thigh between the groin and the elastic bandage. No re-hospitalization has been necessary after the patient has returned home.

One-day surgery is possible in 90% of cases for three reasons:

1. The dressings and postoperative care are extremely simple. The bandage is put on definitively on leaving the operating theatre and it does not affect physical activity at home. Out of 800 patients, 70% stated that they took up normal domestic activities the day after the operation, 20% in 4 days and 10% after 8 days. The bandage can be removed by the patient him/herself.
2. The operation causes little postoperative pain: Firstly due to Muller's phlebectomy – the tiny incisions are practically painless after the operation; The crossectomy incision made in the pubic triangle is in a fixed area, less painful when moving the leg; The lower incision allowing access to the initial part of the great saphenous vein is in an area that is not exposed to bruising by the shoe, situated above the terminal division of the saphenous nerve⁶ and injury during the operation is less fre-

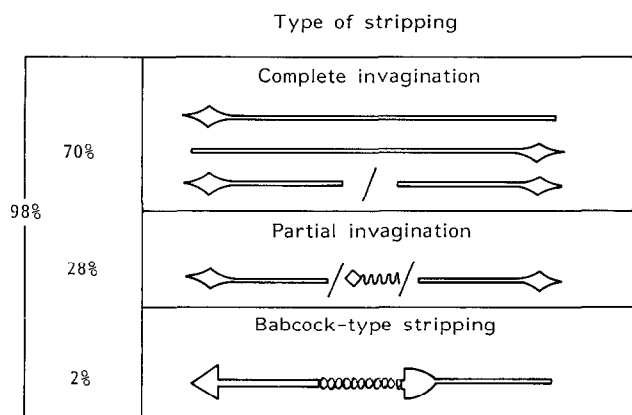


Figure 3. Type of stripping.

quent at this level. Postoperative pain is reduced when stripping is by invagination. We have been able to use this method in 98% of cases – either totally in 70% of cases (downwards, upwards or in both directions with a rupture in the middle) or on three-quarters of the leg in 28% of cases (with a vein telescoping at the level of the knee in the remaining quarter of the great saphenous vein) (see Figure 3). We have been obliged to carry out a classical Babcock-type¹ stripping in only 2% of the cases. Local anaesthesia and continuous aspiration over the whole length of stripping throughout the operation until the dressing has been done, diminishes haematomas and postoperative pain.

Finally, by using the invagination method of stripping we were able to avoid any neurological lesions to the saphenous nerve, which greatly reduces the risk of postoperative pain. In fact, it is known that Babcock stripping under general anaesthesia can cause damage to the saphenous nerve in 30–50% of cases, depending on the direction of the stripping^{2,4,5,7,8}. We have already shown³ that there is a 1.2% risk of injury to the great saphenous nerve during stripping by invagination under general anaesthesia and that when this same invagination stripping is carried out under local anaesthesia, these neurological lesions can be completely avoided when the patient starts to feel a specific ‘muscular cramp’ type pain when the saphenous nerve is stretched in the loop of the invagination.

3. We have been able to reduce postoperative risks considerably, especially thromboembolic risks. We have never had any thromboembolic complications in the 1500 operations carried out under local anaesthesia as 1-day surgery. This can be attributed to the absence of vasoplegia and a concomitant acceleration of deep circulation. The only problem we have had, in 400 patients, concerned a young patient hospitalized for 2 days. The pulmonary emboli which occurred on the eighth day cleared up without after-effects. This represents 2.5 per thousand among the hospitalized patients.

Geographical limits of 1-day surgery

One-day surgery is widely regional:

- 21% of patients live in Nancy or in the close surroundings;
- 74% of patients are uniformly scattered up to 110 km;
- 4% live further away, up to a maximum of 230 km.

After leaving the centre, supervision at home by telephone through the nurse or general practitioner is useful, especially to reassure the patient on the normal evolution of the healing process.

Conclusion

The certainty of being able to improve the results of varicose excision surgery by using local anaesthesia has made us progressively extend this option to all of our patients. Local anaesthesia diminishes peroperative bleeding and postoperative bruising which allows patients to put themselves in the best position for facilitating the operation, and makes it possible (in spite of the femoral block) to avoid any neurological trauma in the area of the popliteal space and to the saphenous nerve during stripping and, lastly, to diminish the risk of thromboembolic complications.

Local anaesthesia, by the persistence of the deep proprioceptive sensation, limits the aggression of the operation and imposes light gestures on the surgeon which can be beneficial for the results of the operation. The anatomical contraindications have been removed by the femoral block and by the precision of location by electrostimulation. Psychological contraindications have been removed by using a short-acting anxiolytic. The perception of local anaesthesia for many patients depends on their contact with the anaesthetist and the surgical team.

The augmentation of our performance of ambulatory surgery, now up to 90%, has been accomplished spontaneously by a regular improvement in the manner of performing the operation. The suppression of major postoperative risks has permitted us to reassure patients and convince them that postoperative surveillance in the hospital is not necessary. The diminution of postoperative pain is the essential element which has permitted us to give our patients satisfactory immediate postoperative autonomy, and to decrease their ‘pain anxiety’ (pain is the element which causes the most postoperative anxiety). Simplifying postoperative care in the home is the last reassuring element of the intervention. The bandage is the surgeon’s signature which the patient takes home with him/her; it must be comfortable and secure.

If local anaesthesia can be imposed on the patient in order to improve the surgical results, ambulatory surgery should be left to the patient’s choice. With improvement in the operating techniques and surgical

environment, ambulatory surgery can be performed 90% of the time.

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BUTTERWORTH
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Day surgery in Sweden

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In order to investigate the extent and organization of day surgery in Sweden a questionnaire was sent to all hospitals. The frequency of day surgery was investigated for 34 different specified operative procedures. The study showed that there were major differences in the frequency of day surgery between different hospitals and for the same type of procedure. There is thus a considerable potential to expand day surgery. The survey also showed that there are no free-standing or satellite units for day surgery in Sweden. At three of the 94 hospitals there are hospital-integrated but dedicated units for day surgery. In the remainder of the hospitals day surgery patients are integrated amongst other patients at the general operating departments. There are, however, plans to separate day surgery from the inpatient operative activities in many hospitals.

Key words: Day surgery, ambulatory surgery, Sweden

Introduction

The increased use of day surgery is one of the most exciting changes in surgical practice during the last few decades. During the 1980s day surgery centres have mushroomed in the United States. The impetus for change has now reached Europe. We therefore decided to do a baseline study of day surgery in Sweden, in order to be able to monitor the changes that undoubtedly will take place in the future.

The Swedish health care system

Sweden is a large but sparsely populated country. The population of 8.7 million is mainly concentrated in the coastal regions and in the south. The number of elderly is high – about 18% are older than 65 years. The health care system has always been regarded as an important part of the Swedish welfare system. A fundamental principle is that all citizens have the same right to good health and equal access to health care, regardless of where they live or their economic circumstances.

Swedish health care is mainly a public responsibility. This responsibility is decentralized to 26 regional political authorities – 23 county councils and three municipali-

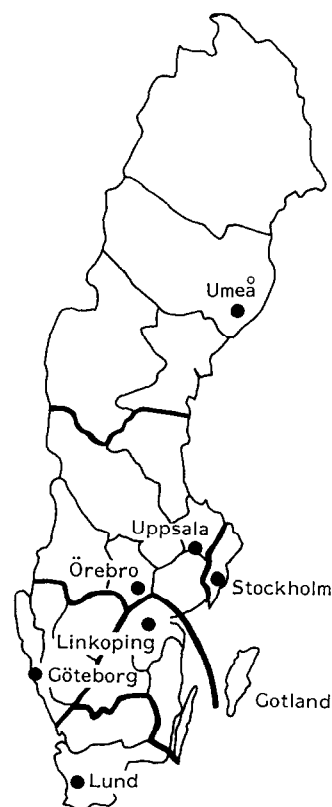


Figure 1. The regional organization of health care in Sweden. — Counties; — medical regions.

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ties (Figure 1). The county councils levy taxes directly, which is the main source of financing. Other sources of

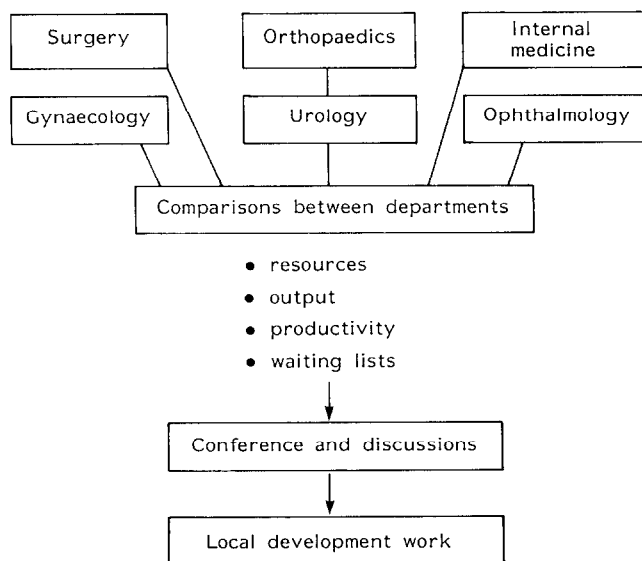


Figure 2. The DAGMAR 50-project.

income are national government grants, about 19%, and patient fees, about 2%, of the total costs¹.

The hospitals are of central importance in the Swedish health care organization. In 1992 there were 94 publicly-run hospitals in Sweden. The size of the hospitals and the degree of specialization differs widely. At almost half of the hospitals there are less than 100 surgical beds. Thirteen hospitals have more than 300 surgical beds. The maximum is a little more than 600 surgical beds. There are also a few small private hospitals. The Swedish hospital system has three levels – regional, county and district county hospitals. Almost all hospitals have concentrated most of their surgery in central surgical units. In mid-sized county hospitals these units usually have 10–15 operating theatres and the number of employees is around 100.

The project

In 1989 the government initiated a project that was named DAGMAR 50. This project had at its disposal 50 million Swedish crowns for studying new ways of increasing the capacity and accessibility of the health care system, within the limits of the existing economic framework². The background to the project was problems with long waiting lists and declining productivity in the Swedish health care system. In cooperation with medical experts in six specialties the Ministry of Health and Social Affairs, the National Board of Health and Welfare, the Federation of County Councils and the Swedish Planning and Rationalization Institute for the Health and Social Services (SPRI) made a common contribution to reverse the current trends. The work started in the autumn of 1989 and was in general completed towards the end of 1991. The planning of the DAGMAR 50 project is outlined in Figure 2.

During 1989 and 1990 the work focused on comparing resources and output between different departments in the six specialties. The comparisons indicated major

differences in productivity and performance and this was used to start discussions on different ways to improve the utilization of the present resources. One of the measures suggested for achieving higher productivity was to increase the use of day surgery.

The questionnaire

In order to investigate the present status of day surgery in Sweden this special study was undertaken in 1991³. A questionnaire was sent to all departments of surgery, orthopaedics, urology, gynaecology, ophthalmology and otorhinolaryngology – a total of 292 departments. In the questionnaire information was requested about the frequency of day and inpatient surgery for 34 different specified procedures. These procedures were selected so that in some cases it was expected that most of the procedures would be carried out on a day-surgery basis. Other procedures were selected so that very few were expected to be carried out as day surgery. The study was carried out in cooperation with the various organizations mentioned above.

In the questionnaire day surgery was defined as follows:

Day surgery is surgery that normally requires major anaesthesia (local, regional, spinal, epidural or general) and includes a period of postoperative recovery (commonly 2–5 h) before discharge.

Results

Complete replies to the questionnaire were received from 85% of the hospitals.

The present organization of day surgery

At three hospitals there are dedicated units for day surgery – Karolinska Hospital in Stockholm, Huddinge University Hospital, also in Stockholm, and at Lund University Hospital in Lund, in the south of Sweden. All three are large university hospitals. At a few hospitals some specialties have organized a day surgery unit within the department. This means that the staff and other resources are shared between day surgery and other activities normally carried out at the department.

The most common way of taking care of the day surgery patients in Swedish hospitals is to integrate them among the other surgical patients. In most hospitals there are, however, separate arrangements for postoperative care for day surgery patients. In some hospitals one or two of the operating theatres serve exclusively as day-surgery theatres. In some hospitals a specific day of the week (usually Friday) is reserved for day surgery. Many hospitals are planning to open day-surgery theatres adjacent to the wards. There are also a few hospitals which have far-reaching plans to set up a free-standing or satellite unit on the hospital campus. So far there are no true satellite units in Sweden but there are some private clinics that perform certain

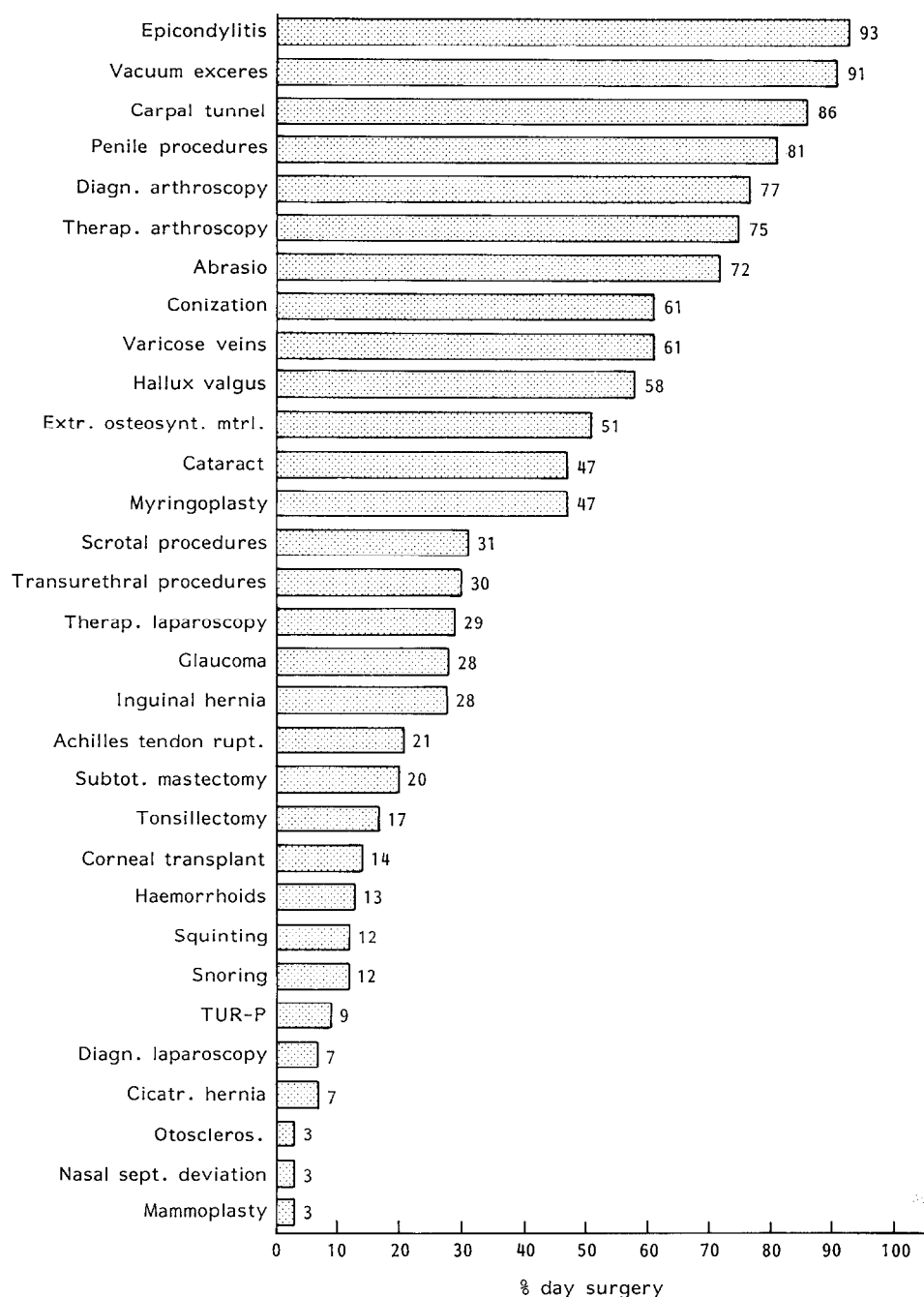


Figure 3. The percentage of day surgery for 34 different procedures during 1991. TUR-P, incontinence, prolapse = 0% day surgery.

operations in day surgery, e.g. cataracts and some plastic surgery procedures.

The frequency of day surgery

The annual rate of operations, excluding minor office surgery, for inpatient care at Swedish hospitals is around 500 000. The number of day-surgery operations is, however, difficult to measure because the National Patient Register only registers data on operation codes of discharges from inpatient care. A day-surgery case is registered as an unspecified office visit in the statistics. There is no way to separate the operations from other visits. There is, however, development work under way with the

intention of including day surgery in the national register of operations.

The frequency of day surgery in 34 different procedures

The departments were asked to report the total number of procedures during 1990 for inpatient as well as day surgery for 34 specified operations. In total there were about 200 000 operations reported and the proportion of day surgery was 48%. An overview of the results is given in Figure 3.

When we analysed the proportion of day surgery for different procedures in relation to hospital level there were obvious differences. Day surgery was generally

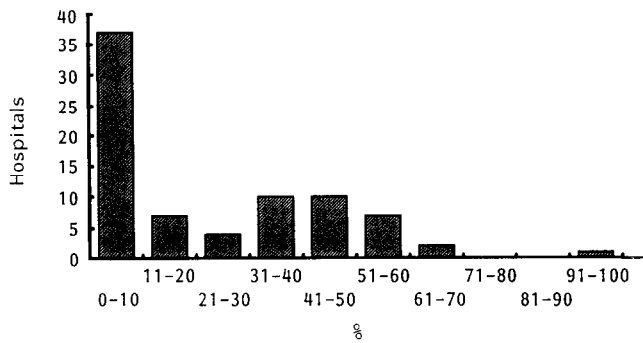


Figure 4. Distribution of day surgery frequency (%) among the departments of general surgery for inguinal hernia operations in 1991. No. of hospitals = 78.

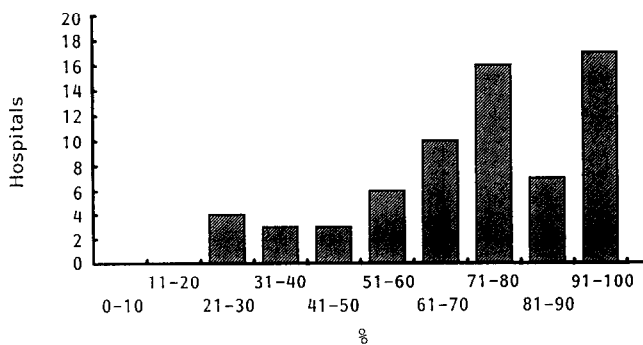


Figure 5. Distribution of day surgery frequency (%) among the departments of gynaecology for abrasio during 1991. No. of hospitals = 66.

more frequent at regional hospitals and county hospitals than at district county hospitals. A few district county hospitals were exceptions to this rule and had a very high rate of day surgery. It is obvious that the degree of specialization does not necessarily make a difference. The competence and attitude of the individual doctor towards day surgery is probably a more important factor. The variation in day surgery proportions between the different departments was extensive for all of the procedures. As an example, Figure 4 shows the frequency distribution of day surgery for inguinal hernia. A total of 78 out of 90 departments in the country answered the questionnaire. One department performed almost all of their hernias in day surgery. In contrast, more than 50% of the units were not doing any hernias at all as day surgery. In the case of abrasio, all of the 66 units performing this operation have answered the questionnaire and all of them do some day surgery (Figure 5). An interesting question is why all the departments cannot do, say, 70% as day surgery, when more than half of the units manage to achieve that figure.

Another example is cataract surgery, where 32 out of 37 eye departments in the country have answered the questionnaire (Figure 6). Cataract operations have, for a long time, been performed as day surgery in the vast majority of cases at Sweden's largest eye department,

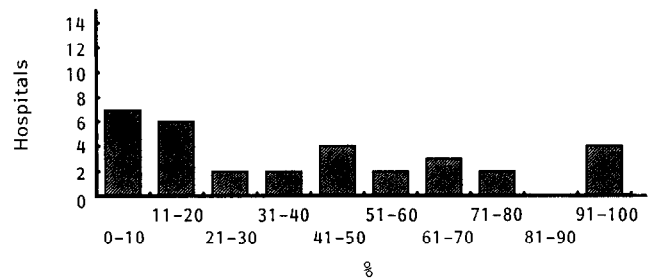


Figure 6. Distribution of day surgery frequency (%) among the departments of ophthalmology for cataract surgery during 1991. No. of hospitals = 32.

the Stockholm Eye Clinic. It is therefore surprising that, as is shown in Figure 6, only 12 of the 33 departments did more than 50% as day surgery. There are still some clinics that have a zero frequency of day operations. The conclusion of the study is that there is a significant potential for the expansion of day surgery in Sweden.

Obstacles to the further development of day surgery

In the questionnaire we also asked the clinicians their opinions about the potential obstacles to the increase of the use of day surgery. As previously mentioned, Sweden is a sparsely populated country and the most common answer to this question was to refer to the long distances that patients have to travel, especially if they are old. Old age as such was also mentioned as an obstacle to day surgery. Others mentioned tradition and conservatism among doctors as the most important obstacle. Many departments did mention the economic circumstances and stated that they had asked for resources to develop day surgery without any success. No one, however, seemed to have discussed the possibility of reallocating resources from inpatient care or other activities to the expansion of day surgery. Practical obstacles were also frequent.

Some of the answers were very explicit and honest. The following quotations serve as examples:

"Up to now we have had plenty of beds and it is then only natural to use them. If there are fewer beds in the future, we will certainly do more day surgery."

"An important obstacle comes from the way that people defend their own territory. They are used to having resources with a low degree of utilization but with high quality. This makes it more difficult to accomplish change."

"The technique used by our anaesthesiologists makes it impossible to change to day surgery. The patients are normally in such a sedated condition that it is impossible to send them back home until at least a day after the operation."

"Politicians and administrators are not aware of the potential savings and possibilities of rationalization that comes with day surgery in the long run. At first

there will be a need for some investments, but in the end it will be profitable."

Many gave lack of knowledge of advantages and disadvantages of day surgery as important reasons. There is also a lack of incentive. These opinions were shared by the experts of the DAGMAR 50 project. Their conclusion in the final report was a recommendation to the authorities to expand the use of day surgery in Swedish hospitals.

Future development of day surgery

Swedish health care is at present undergoing major changes. The recession is only one reason for this. A new government with new aspirations came into power in 1991. There was also widespread opinion, both within the health care sector and among citizens, that the health care system was inefficient in many aspects. It is impossible to foresee what the final solution to the future financing and organization of Swedish health care will be. Economic realities can, however, not be neglected and this has forced the county councils to try new incentives in managing the health service. Those incentives have also promoted the development of day surgery.

In a recent (still unpublished) survey of the day surgery ratio of cataract operations the frequency in 1992 was estimated to be 75% – compared with 47% in 1990. Now, as compared to 1990 all eye departments practice day surgery and many of them do so in almost all cases (Figure 7). A similar survey has recently been done for inguinal hernias, which shows that the frequency of day surgery has also risen since 1990. As shown in Figure 8 most of the departments now do a much greater share of their hernias in day care as compared to 1990.

To promote the development of day surgery further, it has been decided to prolong the DAGMAR 50 project in this area. The aims of this work are to produce guidelines and a state-of-the-art document on day surgery for the different surgical specialties. A new questionnaire has also just been sent out in order to follow up the developments in the frequency and organization of day surgery in hospitals. The DAGMAR 50 survey on new techniques and new ways of organizing health care has so far had major effects on productivity – and, we hope, on quality and effectiveness as well. An urgent question now is to estimate the total need for surgery in Sweden, as the increased use of day surgery in combination with estimates of total need may facilitate the phasing out of redundant hospitals.

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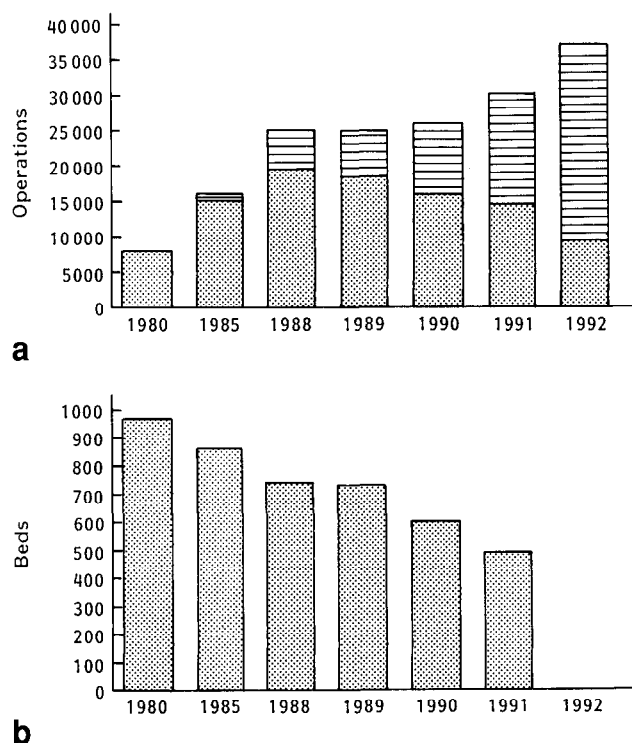


Figure 7. a, Cataract operations in Sweden 1980–1992. ▨ = Day surgery; ▩ = inpatient. b, Hospital beds in ophthalmology 1980–1991.

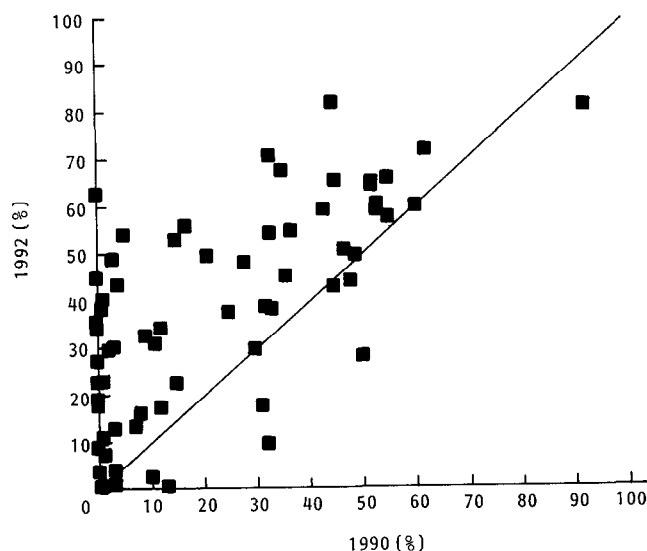


Figure 8. Comparison of day surgery frequency (%) at departments of general surgery in 1990 and 1992 for inguinal hernia operations. Median = 11% in 1990 and 35% in 1992. $n = 73$ units.

- 2 DAGMAR 50 – More value for money in health care (in Swedish). SPRI report 329. Stockholm, 1992
- 3 DAGMAR 50 – Day surgery (in Swedish). SPRI report 336. Stockholm, 1992

New method for ambulatory intubation of nonresectable oesophageal tumours. Experiences in 247 consecutive cases

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Palliative treatment of oesophageal tumours represents an unsolved problem, a field of controversies focused on cost-benefit relation. As a consequence of the continually rising number of advanced oesophageal malignancies in Hungary, enhanced requirements for tube insertion to maintain swallowing capacity emerged at our unit during the late 1980s. In 1990 a new method for tube insertion was elaborated and introduced. Continuous dilatation by an Eder-Puestow device, followed by endoesophageal tube placement with the help of a rigid oesophagoscope under X-ray control enabled us to apply this method routinely as an ambulatory procedure. Two hundred and forty-seven patients were treated, 196 cases underwent 'same day' interventions without hospitalization and a further 51 patients had been admitted earlier for diagnostic purposes. No lethal complications occurred. Twenty-seven patients with oesophagobronchial fistulas were treated successfully; 19 of them ambulatorily. The complications experienced were: perforation (1), tube displacement (7), obstruction (6) and bleeding (2). Comparing our earlier experiences with tube insertion via gastrotomy ('pull through' method) to this new method, the latter shows the following advantages: (a) no direct mortality, (b) low postoperative morbidity, (c) minimal complication rate, and diminished hospital costs up to 95%. Tube implantation promotes intracavitary afterloading radiotherapy of tumours. Results in 62 patients show improvement of survival rate from 5.5 months (controls) to 11.7 months respectively.

Key words: Oesophageal carcinoma, endoscopic palliation, intracavitary irradiation, ambulatory method

Most patients with oesophageal cancer present at a late stage of the disease, when there is a gross and incurable spread of tumour beyond the oesophagus. Because long-term survival is rare, palliation of dysphagia is the major consideration in management with cure being an added bonus. Resection of the tumour with restoration of alimentary continuity offers the best palliation. Resection however is possible in less than 50% of patients^{1,2}. Bypass procedures using colon³, jejunum⁴, or stomach⁵ give unsatisfactory results with significant mortality.

Pulsion intubation will relieve dysphagia and offers the additional benefit of simple execution and rapid effectiveness. This type of palliation seems to be suitable for ambulatory surgery. We report a prospective study of a new endoscopic method for treatment of inoperable malignant oesophageal strictures (Table 1).

Patients and methods

Patient selection

A total of 243 consecutive cases with nonresectable carcinoma of the oesophagus and four elderly patients (aged from 86–93 yr) suffering from reflux stenosis were treated by endoscopic intubation between 1987 and 1992 (Table 2). Non resectability was indicated by the following criteria: (a) Invasion of the trachea or bronchi ($n = 81$); (b) Oesophagotracheobronchial fistula ($n = 27$); (c) Distant metastases ($n = 78$); (d) Mediastinal invasion (operative finding) ($n = 28$); (e) Local recurrence after surgery ($n = 10$); (f) Contraindication for surgery (age, general condition, pulmonary or cardiac complication) ($n = 29$).

No patient presenting with documented oesophageal malignancy was excluded from the study. The mean age of the patients was 57.8 yr (range 38–85 yr), the male : female ratio was 5 : 1.

Patient assessment

The local extent of the tumour was determined by X-ray swallow, chest radiography, fiberoptic endoscopy and bronchoscopy. The operated patients underwent media-

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Table 1. Method of oesophageal intubation for oesophageal stenoses

1. X-ray control	
(a) localization	
(b) length	
(c) characterization	
(d) swallowing	
2. Dilatation	
(a) guide wire introduction	} continuous X-ray monitoring
(b) dilatation up to 45 Ch.	
(c) internal sheath insertion	
3. Tube preparation	
4. Tube placement	
5. X-ray swallow	
6. Discharge	
7. 6 weeks control	

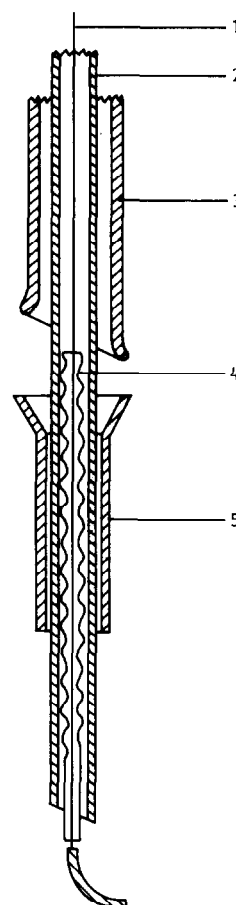
Table 2. Indication for oesophageal intubation (*n* = 247)

Oesophageal carcinoma (without complication)	
upper third	48
middle third	121
distal third (or cardia)	37
Oesophageal carcinoma (with bronchial fistula)	27
Postoperative (anastomotic stenoses)	
oesophagogastric (neck)	6
oesophagogastric (thoracic)	1
oesophagojejunal (abdominal)	3
Reflux stenoses (age: 86–93 yr)	4
Intubation and intracavitary irradiation	62

stinal computed tomography (CT). CT was not accepted as adequate for determination of local inoperability. Histological diagnosis was obtained in all patients. Distant dissemination was sought by ultrasound and CT.

Method

First the exact location of the lesion, including length and degree of the stricture was determined under X-ray control. The upper margin of the stricture was marked by a metal plate placed on the chest wall. The guide wire of the Eder-Puestow dilatator set (Keymed-Olympus) was introduced downward into the stomach (Figure 2a). This step required an upright position, then the X-ray table was positioned horizontally. Dilatation over the guide wire using metal olives was carried out up to 45 Ch. (Figure 2b). Having removed the olives, the semiflexible metal shaft of the device, covered with a plastic tube with a diameter of 30 Ch. was introduced into the stomach over the guide wire. The assistant held the internal tubes straight, which guided the Häring (Rüsch) prosthesis. The outer shaft of a rigid oesophagoscope (Storz) was used to push the prosthesis over the internal conduit, consisting of the guide wire, semiflexible metal shaft and plastic tube (Figure 1). The exact positioning is helped by the indication mark. While holding the prosthesis in the proper position with the oesophagoscope, the guiding

**Figure 1.** Sketch of the procedure. 1. guide wire; 2. plastic tube; 3. rigid oesophagoscope; 4. semiflexible shaft of Eder-Puestow device; 5. Rüsch tube.

device was carefully removed. Then, under gentle rotation, the oesophagoscope was disengaged from the endoprosthesis and removed (Figure 2c). An immediate X-ray swallow in the upright position was performed to control the situation (Figure 3), and the thorax underwent fluoroscopic checking. When the passage was adequate, the patient was ready to eat and was discharged after an observation period of 1–2 h.

The length of the prosthesis used by us was 9–12–18 cm, but it is possible to cut the tube according to the required size.

Intracavitary irradiation: 62 patients underwent intracavitary irradiation after loading radiotherapy (MEV Curietron) after endoscopic intubation. A ^{137}Cs energy source was applied. According to the tumorous mass the doses were calculated by a computerized program (isocentric method, Varyter-XT) offering an effective tumour dose of 15 Gy during 24 h. This session was repeated two or three times, resulting in a total dose of 45–60 Gy.

Pull-through intubation: The results of ambulatory endoscopic intubation were compared with a historical series of 54 patients, having been operated between 1985 and 1989 for unresectable oesophageal cancer. The Rüsch tube was placed via gastrotomy. Mean age of this group was 56.7 yr (range 42–77 yr), male : female ratio was 5 : 1.

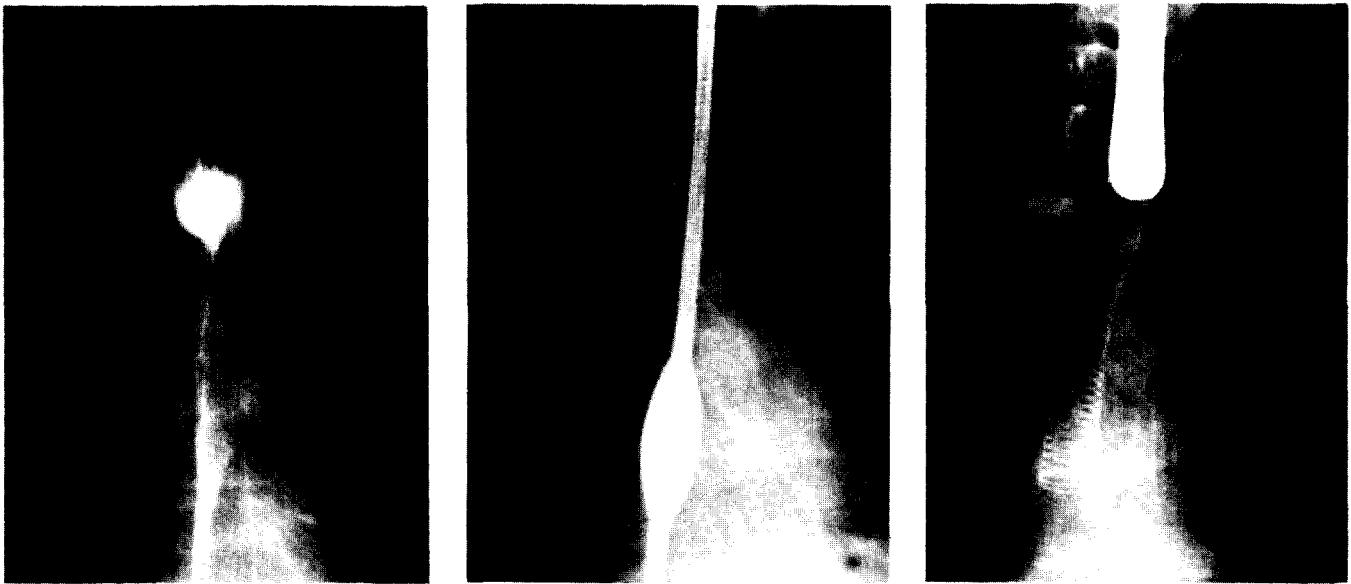


Figure 2. a, Guide wire introduced into a near complete malignant stricture in the upper third of the oesophagus; b, Dilatation using Eder-Puestow device; c, Tube insertion with help of a rigid oesophagoscope.



Figure 3. Gastrographine swallow showing oesophagotracheobronchial fistula. Note the extended necrosis of the esophageal wall: the ingested contrast material fills the left bronchial tree.



Figure 4. After tube insertion gastrographine swallow shows a proper placement: contrast material flows unimpeded into the stomach

Results

Complications are listed in Table 3. No lethal complications occurred. The patient in whom the guide wire caused perforation through the tumour mass was successfully intubated and had an uneventful postoperative course having been given antibiotics to prevent mediastinitis. Two malpositions required removal of the tube, but in both cases successful reintubation was performed. Two patients with malignant stricture in the upper mediastinum experienced severe pain after tube insertion, so both prostheses should have been removed by

endoscope. In three patients with tumour of the cardia, infiltrating the lesser curvature of the stomach, a proper tube placement was impossible.

Late complications occurred in 7.8% of the successfully intubated 242 patients. In nine cases the prosthesis slipped down. Six were removed from the stomach using fibroscope, three patients were operated and the tube was removed surgically from the ileum. No deaths occurred. It is important to note that in both cases with reflux stenosis the tube remained in the proper position for only 1 or 2 weeks, then X-ray control demonstrated displacement to the stomach. Severe bleeding occurred in four

Table 3. Complications

	<i>n</i>	Deaths
Early		
perforation	1	—
malpositioning	2	—
pain (removal)	2	—
technical failure	3	—
Late		
dislocation (distal)	7	—
obstruction	6	—
bleeding	2	2
Intubation and intracavitary irradiation		
dislocation (distal)	2	—
bleeding	2	2

patients: two in the irradiated group. All patients died in haemorrhagic shock and/or aspiration.

Survival of the patients is shown in Figure 5. Mean survival of patients after endoscopic intubation was 7.2 months, better than those without tube insertion (5.5 months⁶), but the difference is not significant. Patients given afterloading radiotherapy have a significantly better late survival of 11.7 months.

Figure 6 compares the conventional surgical placement of prosthesis with the results of endoscopic intubation. The 23.7% mortality and 43.6% complication rate of surgical intubation is significantly higher than those of the group of endoscopically intubated patients (0 and 2.8%). The success rate is the same. Hospital stay for the operated group was 24.6 days. Calculating 1 day for ambulatory procedures, mean hospital stay for the 'push through' group was 1.7 days. The estimated costs for the endoscopic group are 14.1% of those for the patients who underwent surgery. The costs for the ambulatory procedure itself represent only 5% of the expenses for the conventional 'pull through' method.

Discussion

For patients with unresectable oesophageal carcinoma palliation of dysphagia is the prime objective of treatment. The place of radiotherapy has been imprecisely defined with up to 50% of patients requiring subsequent dilatation for aggravation of dysphagia⁷. Where tumours of the upper thoracic oesophagus have infiltrated the airway, radionecrosis will hasten the development of an oesophagorespiratory fistula^{4,8}.

Reopening of the obstructed lumen can also be achieved with Nd:YAG laser photocoagulation. It is particularly indicated in cases in which a prosthesis is less suitable (cancer is overgrowing the tube, tumour is excessively soft, when tumour infiltrates the upper sphincteric area, etc.). A major disadvantage of laser therapy is that several sessions are necessary, and the palliative effect is short-lasting; dysphagia recurs after 3 to 5 weeks^{9,10}.

Bypass procedures have their proponents and the preferred organ is the stomach¹¹. Postoperative complica-

tions, significant mortality rate and poor improvement of nutritional status after gastric bypass make this procedure controversial.

Intubation of the oesophagus offers a satisfactory solution to a difficult problem. Tubes may be inserted by traction¹²⁻¹⁴ or pulsion.¹⁵⁻¹⁷ The latter seems to be favoured^{18,19}. A prosthesis can usually be placed anywhere in the upper gastrointestinal tract, provided the stricture is of circular shape and provided proper prior dilatation can be carried out. It is usually well tolerated with no sensation of the presence of a foreign body, if the proximal funnel rim is located at least 2 cm distal to the upper oesophageal entrance²⁰. Small tumours formatting severe stenosis can cause intolerable pain after intubation (see complications, Table 3). Furthermore, a prosthesis can be positioned at the gastroesophageal junction, provided measures are taken to prevent reflux. The guide wire should be introduced correctly, but depending upon the extent of tumorous infiltration of cardia, the proper positioning of the prosthesis can be extremely difficult, or sometimes impossible (three cases out of our 247).

Difficulties may be encountered during insertion of a prosthesis in the presence of sharp angulation due to tortuous tumour growth, previous surgery, or severe kyphoscoliosis. The insertion of the prosthesis is facilitated by using the Eder-Puestow device which stiffens and straightens the dilatation and insertion path. The use of the external plastic tube on the semiflexible shaft prevents unnecessary movement or kinking of the prosthesis. The metal coils in the wall of the Häring tube offer the required stability and flexibility for the 'push through' method^{6,12}.

Perforation is a major life-threatening complication. A rate of around 6-8% seems to be a feature of fiberoptic intubation^{15,16,21}. Tube insertion by rigid oesophagoscope after previous dilatation with the Eder-Puestow device as practised by us has been proved much safer, with less than a 1% perforation rate. The critical step is the proper placement of the guide wire, once correctly introduced, dilatation and subsequent intubation under X-ray control is usually successful.

The 'push through' method for placement of a prosthesis is less time consuming than conventional surgical intubation. The method presented in this article is suitable for ambulatory surgery, as dilatation and tube insertion is performed in one session, even in the case of oesophagorespiratory fistula. Any type of prosthesis suitable for the 'push through' method can be used for intubation with special regard to the rigidity and flexibility of the tube. In general, the patient needs no hospitalization, provided X-ray control shows correct palliation of malignant dysphagia. We believe that giving adequate information to the patient is mandatory for assessing late complications, requiring subsequent control at the outpatient unit.

The cost saving effect of this method is as evident as that of any other form of successful ambulatory surgical intervention.

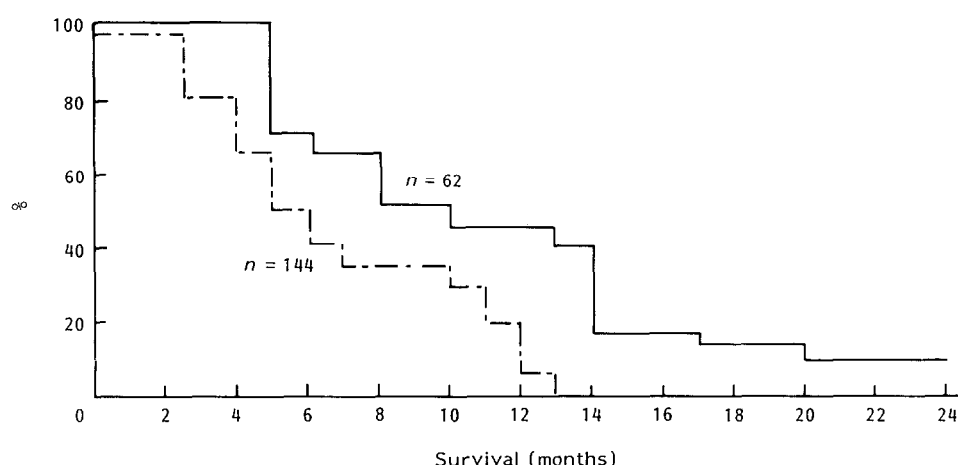


Figure 5. Survival after endoscopic intubation for malignant oesophageal stricture with (—) and without (---) postoperative radiotherapy.

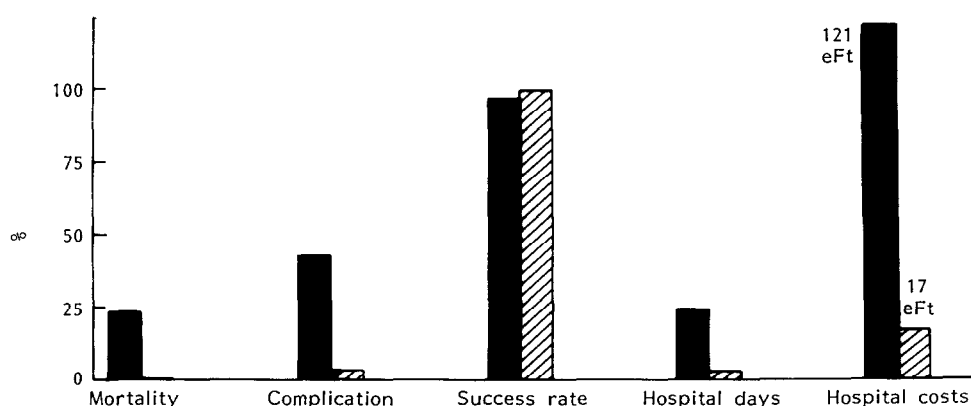


Figure 6. Comparison of "pull through" (surgical), ■, and "push through" (endoscopic), ▨, methods for oesophageal intubation.

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Economic aspects of day surgery

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Day surgery is rapidly increasing in the Netherlands. The pressure on hospitals for greater efficiency is one of the most important factors behind this trend. Figures giving type of patients treated in day care and costs are presented.

Key words: Day surgery, economic aspects, efficiency, type of patients

Introduction

This paper deals with three main subjects. Firstly, there is a description of some general aspects of the hospital system in the Netherlands. Subsequently, some facts and figures are presented about the developments in day surgery within general hospitals in the Netherlands and, finally, there is a discussion about the costs of day care and incentives and disincentives within the budget system, as it functions in the Dutch situation.

General aspects of the hospital system in the Netherlands

In the Netherlands there are, at present, 113 general hospitals and eight university hospitals. These are the hospitals in which day care surgery takes place. Apart from these, there are also a number of special category hospitals, but these have been excluded from discussion in this paper. The number of hospitals has been decreasing since 1975, from 191 in that year, to not more than 113 in 1992. This substantial reduction in the number of hospitals is mainly due to the large number of mergers. In the Netherlands, there have been two periods of mergers. At the end of the 1970s and the beginning of the 1980s, hospitals were confronted with an enormous merging process because of the building policies of the government. The government issued permits for building and rebuilding of hospitals under the terms of an enforced merging process between two or more hospitals within each particular city. After 1985 there was a second surge of mergers which, in particular, had a more strategic background, resulting from a huge merging process

which took place within the health insurance companies. Because of this new system, as adopted by the Dekker committee, and later by the government, the health insurance companies obtained a greater influence in the health care business. The surge of mergers and concentration by the insurance companies brought about a similar kind of merging surge on the part of the hospitals.

At the same time as this reduction in the number of hospital beds occurred, there was a corresponding increase in the size of hospitals and an extension of specialist functions. In 1975 the average general hospital had 315 beds, whereas in 1992 this had increased to 436 beds. The extent of the package of specialist functions has grown considerably as well. In contrast to 1975, in which the average hospital had 13.9 specialist functions, this had almost doubled to 26.4 in 1992. Parallel to this development, the number of beds per 1000 inhabitants has dropped, on the one hand as a result of the reduction in the number of beds and on the other hand because of the growing population. During the last few years, therefore, there has been an increase in waiting lists, particularly for surgical treatment, by more than 50 000 patients, who have had to wait for over four weeks for admission.

An important prerequisite for the efficient functioning of hospitals is defrayment. In 1983 an important change occurred in the budget financing system of hospitals. Up until then there had been an open-ended financing system which was product-oriented, but after 1983 hospitals had to work within fixed budgets, under which the total patient intake had to be admitted, treated and taken care of. This system underwent a further important change in 1988, when the fixed budget financing system became related to the package of functions a hospital had to offer. That is, the system was based on the number of beds and specialist functions on the one hand, and the population and use of different hospital functions on the other. Every hospital had to make annual agreements with the health insurance companies about the use of

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Table 1. Admissions, day-care patients, outpatients in general and teaching hospitals (000s)

	1975	1979	1985	1988	1991
Admissions	1394	1513	1520	1481	1512
Day-care patients	—	51	214	342	456
Outpatients	3608	4222	4287	5434	6480
Total patients	5002	5786	6021	7257	8448

Table 2. Average yearly increases 1975–1992

	%
Admissions	0.5
Day-care patients	22.3
Outpatients	5.0
Total patients	4.3

hospital functions and the number of beds. This was done in terms of the number of admissions, patient days, first outpatient visits and day care. These agreements are made in advance of each particular year and are laid down in terms of reference. Deviations from these fixed budgets are not allowed.

Developments in day surgery

In this section some facts and figures are presented on developments in day surgery within hospitals, as well as in relation to other developments in the use of hospital services. In Table 1 the development in the number of admissions, number of day-care patients and number of first outpatient visits are presented. In 1991 there was a total patient intake of about 8.5 million, which represents a huge increase in the number of patients treated in general hospitals since 1975, when there was a total intake of 5.0 million. Looking at the underlying figures, the number of clinical admissions has increased slightly from 1.4 to 1.5 million. The number of outpatient visits, on the other hand, has increased from 3.6 to 6.5 million. The number of day-care patients has also increased considerably from 0 (zero) in 1975 to 450 000 in 1991. In Table 2 these developments are presented in percentage terms. The total intake of patients has increased annually by 4.3%. Subdivided into the three different ways in which patients can be admitted to hospital, this results in the following picture: the number of clinical admissions has increased by about 0.5% per year; the number of day-care patients by over 20%; and the number of first outpatient visits (that is, the number of times a patient visits the polyclinic for the first time) by about 5%.

The average duration of inpatient stay for clinical patients has almost halved since 1975, from 15.4 days to 8.2 days in 1991. This can largely be explained by the increase in outpatient treatment, and especially by the increase in day surgery. In Table 3 the total number of operations performed in general hospitals is divided between the three kinds of surgical treatment. The

Table 3. Operations in general hospitals

	1975 %	1991 %
Clinical operations	58	32
Outpatient operations	42	52
Day treatment	—	16
	100	100

Table 4. Type of specialty in daycare

	%
Ear, nose and throat	24.3
Gynaecology/obstetrics	14.1
Internal medicine	13.6
General surgery	13.3
Orthopaedics	9.6

number of clinical operations has decreased from 58 to 32%. The number of polyclinic operations, however, shows an increase from 42 to 52%, and for day surgery from 0.75 to 16% in 1991. From these figures it is clear that ambulatory surgery has increased considerably since the second half of the 1970s.

Table 4 presents day-care patients divided into types of specialty, which shows that the majority of day surgery is taken up by ENT, gynaecology and obstetrics, internal medicine and general surgery and orthopaedics. Table 5 shows the type of procedures involved and also gives a comparison between 1985 and 1990. It is possible to infer from this table that the operations in question show a major shift from clinical treatment to day care. On average, the percentage for these day-care treatments is 14.7 for 1985 and, for the same category, 28.4 in 1990. This represents a doubling of the number of patients that are treated in day care within these categories. However, it is not only day surgery that is performed by hospitals in the field of ambulatory care. Table 6, for example, shows the percentage of diagnostic tests for outpatient visits to general hospitals. In 1991, 75% of tests carried out by the X-ray department were on behalf of polyclinic patients, and for laboratories this figure was over 50%. The number of diagnostic tests in laboratories and X-ray departments that are carried out on behalf of general practitioners has also increased considerably (see Table 7).

Table 5. Type of patients in day care

Operation groups	1985		1990	
	% clinic	% day care	% clinic	% day care
Eye operations	91.4	8.6	79.1	20.9
Ear operations	45.2	54.8	20.9	79.1
Heart & thoracic vessels	98.8	1.2	94.1	5.9
Varices operations	96.7	3.3	71.8	28.2
Gall bladder operations	100.0	0.0	98.4	1.6
Hernia operations	95.2	4.8	83.4	16.6
Bone & muscle system	90.5	9.5	78.4	21.6
Total	85.3	14.7	71.6	28.4

Source: SIG.

Table 6. Percentage of diagnostic tests for outpatients in general hospitals

	1975 %	1991 %
X-ray	73.8	75.6
Laboratory	48.4	55.7

Table 7. Percentage of X-rays and laboratory tests on behalf of general practitioners

	1981 %	1991 %
X-ray	20.1	25.4
Laboratory	13.1	14.7

Costs of day surgery and the budget financing system

Table 8 presents the structure of the budget system for general hospitals in the Netherlands. This table shows that the total variable component of the budget for day care is about 2%, and for first outpatient visits this figure is 14%. This means that the total percentage for day care and first outpatient visits represents only a small proportion of the total budget. Despite this, previous figures

Table 8. Proportion of total budget for day care

	Share %	Cost Dfls
Fixed component:		
Adherent	15	80
Semi-fixed component:		
Specialists	25	353 000
Beds	9	11 000
Variable component:		
Admissions	20	1150
Days of hospitalization	12	60
First outpatient visits	14	150
Day care	2	410
Special functions	3	
Total	100	

Source: Het Ziekenhuis, December 1991.

show that there has been a considerable increase in ambulatory surgery in general hospitals. It is therefore of major importance that changes are introduced in the budget system to give incentives for the further development of day surgery. A closer relationship needs to be established between the actual costs of day care and day surgery and the provision made for them in the budget. Current inconsistencies in the system need to be removed so that the benefits to be gained from the development of ambulatory surgery are made clear.

Hernia surgery in a defined population. Improvements possible in outcome and cost-effectiveness

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During 1992 operations for groin hernia in adults were prospectively recorded in eight hospitals with a total catchment area covering 761 000 inhabitants. An operation rate of 254 (147–478) operations per 100 000 inhabitants per year, mean and range for the eight hospitals, was observed. Seventeen per cent of all 1936 operations were done for recurrent hernias, range 10–21%. The Bassini repair and the Shouldice technique were used in 29 and 25% of the herniorrhaphies, respectively. A low but increasing use of laparoscopic surgery was noted. Four patients with a median age of 84 years died postoperatively. The rate of day surgery varied significantly between the hospitals, from 0–59%, mean 30%. A prospective registration of the present type allowing interhospital comparisons and serving as a basis for audit may be of value in improving outcome and cost-effectiveness in hernia surgery.

Key words: Hernia repair, surgery rate, audit

Introduction

Herniorrhaphy is the most commonly performed operation on adult males in general surgery¹. The outcome following groin hernia repair of experienced surgeons is well documented with recurrence rates around or below 1% using the Shouldice technique^{2–4} or recently, tension-free repairs with prosthetic mesh⁵. Outside specialized units recurrence rates within the range 5–20% have been reported^{6,7}, but information is scanty concerning type of operation used, fraction of patients treated within day surgery, as well as morbidity and patient satisfaction after operation. The present study was initiated in order to study management of groin hernias within a defined and fairly large population, thereby also establishing a basis for evaluation of long-term outcome.

Methods

From 1 January to 31 December 1992 eight Swedish hospitals, seven located in the south-east region of Sweden and one further north recorded all hernia operations

on patients above the age of 15 years according to a common protocol. The population studied amounted to 761 000 inhabitants. The protocol covered data concerning patient characteristics including suitability for follow-up, time on waiting list, day surgery or nights spent in hospital, acute or elective surgery, information on operation (type of procedure, suture material, bowel resection, intraoperative complication, surgeon), anaesthesia, postoperative complication. Data from each hospital were stored in computerized form. After the end of the registration period statistical analyses were performed with the Quest program⁸.

Definitions

Day surgery: In hospital stay less than 12 h.

Mean hospital stay: Number of nights in hospital for a group of patients studied divided by total number of patients within that group.

Postoperative death: Mortality within 30 days after operation.

Statistics

Chi squared tests were used to test independence between parameters and difference between groups; *P* values stated are double-sided.

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Table 1. Inguinal and femoral hernia repair in relation to age and sex

Hernia type	Age (years)	Sex		Total
		Male n	Female n	
Inguinal	15–24	52	5	57
	25–34	92	13	105
	35–44	158	13	171
	45–54	289	20	309
	55–64	380	14	394
	65–74	455	26	481
	75–84	274	40	314
	> 85	39	3	42
Total		1738	134	1873
Femoral	15–34	0	3	3
	35–44	3	3	6
	45–54	4	6	10
	55–64	2	2	4
	65–74	9	12	21
	75–84	7	6	13
	85–94	1	5	6
Total		26	37	63

Table 2. Hernia type – primary and recurrent hernias

Hernia type	Primary		Recurrent		Total	
	n	%	n	%	n	Acute n
Direct	484	30.0	172	53.3	656	38
Indirect	870	53.9	89	27.6	959	41
Combined	137	8.5	21	6.5	158	5
Femoral	50	3.1	13	4.0	63	17
Sliding*	49	3.0	14	4.3	63	2
Others	23	1.4	14	4.3	38	2
Total	1613	100	323	100	1936	105

*This group was used for sliding hernias not classified in any other group.

Results

Incidence, type of hernia and reoperation rate

In the participating hospitals 1936 operations for groin hernias were performed during 1992, giving an incidence rate of 254 per 100 000 inhabitants per year. The range of the rates for the eight hospitals were overall 147–478. During the first half of the year 1077 patients were treated, during the second half 859 patients. The age of the patients was 62 (49–72) years (median, upper and lower quartile). Age- and sex-specific operation rates are given in Table 1. Table 2 shows type of hernia for primary and recurrent hernias separately. As can be seen, 54% of the primary hernias were indirect and 30% direct, the corresponding figures for recurrent hernias being 28 and 53%, respectively. The overall reoperation rate was 17% (323 out of 1936 herniorrhaphies) with a variation between the hospitals from 10–21%, the inter-hospital difference failing to reach statistical significance ($\chi^2 = 12.7$, $f = 7$, $P = 0.08$). In 105 cases the indication to operate was considered acute and six of eight bowel

Table 3. Type of operation

Technique	Repair n	%
Bassini	564	29.1
Shouldice	489	25.3
Other*	362	18.7
McVay	214	11.1
Marcy	153	7.9
Laparoscopy	88	4.5
Mesh	34	1.8
Nyhus	32	1.7
Total	1936	100

*Repair not adequately described by other methods according to operating surgeon.

Table 4. Suture materials

Material	No.	%
Absorbable	506	26.1
Polyglycolic (Dexon®)		
Polyglactin 910 (Vicryl®)		
Slowly-absorbable	762	39.4
Polydioxanone (PDS®)		
GTMC (Maxon®)		
Non-absorbable	643	33.2
No information	25	1.3
Total	1936	100

resections were undertaken among these patients (Table 2). A significantly higher proportion (27%) of patients with femoral hernias were operated as emergency cases as compared to all other hernia patients ($\chi^2 = 54.8$, $f = 1$, $P < 0.001$). Four patients with femoral hernias underwent bowel resection.

Treatment and postoperative mortality

The surgical methods used are listed in Table 3. Significant variations in choice of operation appeared among the hospitals. The most frequent operation was the Bassini repair or a variant thereof. However, in four hospitals the Shouldice technique was performed predominantly. During 1992, 88 patients underwent laparoscopic operations and 72 of those were done during the latter half of the year. Table 4 gives the frequency of suture materials used in the 1936 repairs. Spinal or epidural anaesthesia was used for the majority of operations (Table 5). Thirty-three procedures were performed under local anaesthesia, 21 in one hospital. Four patients died postoperatively (Table 6). As evident, the median age of these patients was 84 years. Three of them were operated as emergency cases and two patients presented with femoral hernias.

Table 5. Anaesthesia

Type of anaesthesia	No. of procedures
Spinal, epidural	1462
General	493
Local	33
Total	1936

Waiting list

A new bill was passed in Sweden on 1 January 1992 stating that a patient who has been on the waiting list for hernia surgery for three months or more must be offered treatment at another hospital. Therefore, it was considered of interest to analyse separately time on waiting list for patients with a decision to operate before and after this date. As shown in Table 7, 63% of electively treated patients had to wait three months or longer to have their operation done before 1 January 1992, whereas the corresponding figure for patients seen after this date was 13%.

Day surgery and hospital stay

Of all 1936 operations 588 or 30% were performed as day surgery. There was a great variation in day surgery rate between the eight hospitals, range 0–59%, and the interhospital difference was highly significant ($\chi^2 = 266$, $f = 7$, $P < 0.001$). The inverse relation between mean hospital stay and day surgery rate at the eight hospitals is illustrated in Figure 1.

Discussion

The present registration was initiated in order to study management of groin hernia of adults in a defined and fairly large population, thereby stimulating discussion on outcome and cost-effectiveness in hernia surgery. The mean incidence of hernia surgery in our population was high, 254 per 100 000 inhabitants per year with a considerable interhospital variation. Ambitions to reduce or abolish waiting lists might have caused some artefacts as the operation rate was 20% higher in the first compared to the latter half of the year. Our operation rate is of the same size of order as observed in the USA, Australia and Norway where access to elective surgery is good⁹. In the UK, however, regional age- and sex-standardized rates for primary inguinal hernia repair vary from 115–170 per 100 000 inhabitants per year (including hernia surgery below the age of 15 years which accounts for 15% of all inguinal hernia repairs, but excluding hernia surgery in the private sector)¹⁰.

The distribution among different types of hernias with a 30% fraction of direct hernias observed in the present survey is in accordance with previous reports^{11,12} as is the preponderance of females and the high percentage of acute operations among femoral hernia patients^{1,13}.

Reoperations for groin hernias invariably indicate surgical failures of the past. Hence, reoperation rate might

indirectly and with some delay reflect the standard of hernia surgery within the population studied. It should be differentiated from recurrence rate which refers to a cohort of patients reinvestigated at a given time after operation requiring knowledge of the method of control, the completeness of follow-up, and of the definition of recurrence used in order to make comparisons with other series meaningful⁷. However, unless drastic changes in surgery have been undertaken recently a correlation between reoperation rate and recurrence rate is to be expected. The mean reoperation rate observed in the present survey, 17%, is a matter for great concern. For comparison it might be noted that the average reoperation rate in England falls slightly below 10%¹⁰.

Long-term outcome following hernia surgery depends on several factors, surgical experience and training of junior staff members, choice of technique and suture material. In our eight hospitals, the Shouldice technique was used in 25% of all operations. According to a recent report a similar fraction (26%) of consultant surgeons in the UK practised this technique¹⁴ which, in contrast to other hernia repair methods in experienced hands, has produced long-term recurrence rates of around 1%^{2–4}. However, a learning curve is to be expected by surgeons adopting the Shouldice technique¹⁵. It should also be pointed out that the original description of the Bassini technique encompassed a complete division of the transversalis fascia as well as a reconstruction of the floor of the inguinal canal¹⁶ which is often omitted in modern Bassini modifications. Another observation of interest in our study was the obvious increase in laparoscopic hernia surgery. The cost-effectiveness and outcome of this operation remains to be evaluated. The healing phase of fascia and aponeurose is known to last for some three months. The use of non-absorbable sutures as advocated in the Shouldice technique is therefore logical. In the present survey polyglycolic and polyglactin 910 sutures with a variable retention of tensile strength (50% may be lost in 15 days *in vivo*)¹⁷ were used in 26% of operations.

A mean day surgery rate of 30% was observed in this study with an interhospital range from 0–59%. Although local factors beyond the scope of this survey might contribute to the size of this variation, it nevertheless suggests that routine management of our hernia patients needs re-evaluation. In a controlled study of day-case herniorrhaphies no surgical adverse effects were observed when day cases were compared with inpatients¹⁸. One Canadian study demonstrated that day surgery was an appropriate form of care for hernia patients¹⁹ and the same conclusion was reached for elective day-case herniorrhaphy by the Commission on the Provision of Surgical Services of the Royal College of Surgeons of England in 1985²⁰.

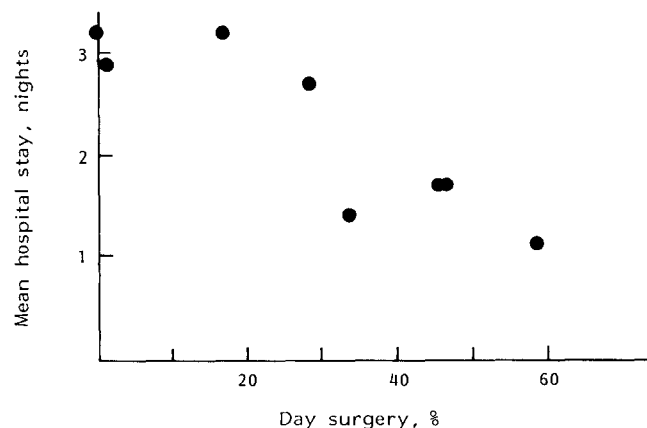
Thus, the present study has indicated topics worthy of further consideration – a high reoperation rate, great variations in application of surgical methods with a still low but increasing use of laparoscopic surgery, and great differences in day surgery rate. The protocol used has been suitable for collection of data concerning manage-

Table 6. Details of four patients who died postoperatively

Age	Sex	Indication to operate	Hernia type	Bowel resection
72	Male	Acute	Femoral	No
83	Male	Elective	Combined	No
85	Female	Acute	Femoral	Yes
91	Male	Acute	Direct	No

Table 7. Waiting list

Time on waiting list (days)	Before 1 January 1992		After 1 January 1992	
	n	%	n	%
0-89	161	37	1273	87
≥90	269	63	186	13
Total	430	100	1459	100

**Figure 1.** Day surgery vs. hospital stay – eight hospitals.

ment of groin hernias and has allowed interhospital comparisons which may be powerful incentives for improvements. The register may be used as a basis for audit of outcome and it may allow comparisons over time.

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Obstacles to the development of day surgery practice in Belgium

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Ambulatory surgery interventions can be carried out in most Belgian hospitals without major side effects and to the satisfaction of the doctor, the patient and his socioprofessional environment and the health care insurers. However, the development of day surgery practice is severely hampered by the absence of a specific one-day clinic policy with clearcut guidelines and financial incentives for the hospital administrator, the doctor and the health care insurer. Ambulatory treatment is actually promoted by stimuli adapted to the individual hospital and directed to occupation rate, staff and organization. The budget savings obtained from a reduction in hospital admission days will be shared between the hospital and health insurance companies.

Key words: Ambulatory surgery, one-day clinic, health policy, health care financing

Introduction

Surgical and medical ambulatory treatment in hospital facilities has become increasingly popular among hospital administrators, doctors and patients. Since the introduction in 1982 of a yearly fixed quota of hospital admission days, every institution confronted with a growing number of inpatients seeks to reduce the mean length of stay in order to increase its total admission capacity. Together with a progressively closed-budget financing per diagnostic category for the total treatment regardless of the individual duration of the admission, the hospital becomes more dependent on the total pathology profile and the turnover rate of its patients.

The progress of medical technology in anaesthesiology, endoscopic and imaging techniques has enabled the doctor to carry out safely a growing number of diagnostic and therapeutic procedures safely on an ambulatory basis. In the one-day clinic structure the surgeon has both increased his patient capacity and has improved his treatment planning. For the patient and his immediate environment ambulatory treatment in the hospital combines the advantages of a quality-assured medical procedure with avoiding the inconvenience of overnight stay, repeated visits by relatives and a longer period of interruption of his/her professional activities. Finally,

not only the employer but also the health care insurer is saving money by ambulatory treatment.

If all parties are interested in the promotion of the one-day clinic, what causes the considerable differences between various hospitals in adequate use of diagnostic and therapeutic means, and in the proportion of ambulatory and inpatient treatment for the same medical conditions? The investigation of historical, organizational and financial reasons actually limiting the development of day surgery practice in Belgium has helped the authorities in adjusting health policy on ambulatory treatment.

Day surgery practice in Belgium

In 1993 ambulatory treatment has become common practice for medical and diagnostic procedures such as endoscopy, biopsy, invasive imaging and chemotherapy. In one-day clinics general surgical procedures (e.g. skin lesions), oral surgery, ear-nose-throat, orthopaedic, ophthalmologic, urologic, gynaecologic and plastic surgery are most frequent. In Table 1 the evolution since 1986 of some in- vs. outpatient-based frequent surgical interventions in Belgium is shown. Even if ambulatory surgery increases in general, the one-day clinic share of routine procedures such as inguinal herniorrhaphy, arthroscopic meniscectomy and amygdalectomy is still disappointingly small.

In a small country like Belgium with a large number of hospitals (210) for a population of 10 million, day surgery facilities are hospital-based (for selective procedures three free-standing ophthalmologic day surgery clinics are privately owned and operate autonomously) and of two different types. The first type of hospital-based fac-

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Table 1. Evolution of some in- vs. outpatient-based surgical interventions in Belgium

		1986	1987	1988	1989	1990	1991	1992
Adenoidectomy	in	9584	8351	9048	8921	8482	8230	9401
	out	11 444	12 222	14 590	16 647	15 482	17 841	19 974
Amygdalectomy	in	13 362	13 642	13 674	14 425	15 783	16 687	18 543
	out	4892	5585	5994	6310	6308	6947	7519
Uterus curettage	in	35 020	35 480	32 027	31 485	29 993	29 097	26 564
	out	10 816	12 112	13 222	15 958	17 391	20 534	21 135
Arthroscopic meniscectomy	in	11 443	15 360	15 897	16 327	17 944	21 419	21 310
	out	470	715	1128	1850	2369	3465	4506
Circumcision	in	8636	8376	7954	8000	7821	7579	7250
	out	1870	2779	3174	3851	4699	5571	6319
Vasectomy	in	3028	2416	1826	2023	1793	2089	1723
	out	15 479	15 224	14 271	14 856	14 920	15 237	15 076
Inguinal herniorrhaphy	in	26 184	27 766	26 392	25 427	26 174	26 695	26 948
	out	179	202	228	497	643	865	1070
		152 407	160 230	159 425	166 577	169 802	182 256	187 338

Table 2. Evolution of day care practice in Belgium based on the number of forfeitary nursing-cost reimbursements*

Nursing-forfeitt	1987	1990	1992
Mini	24 663	37 307	45 000
Maxi	134 734	220 999	250 107
Super	36 789	74 609	85 040

* < 40% are minor surgical procedures.

†The forfeitary sum is due per procedure accepted for one-day clinic reimbursement and is approximately 30% (mini), 60% (maxi) or 120% (super) of the per diem price for each hospital, individually determined and based on overhead expenses, hotel and nursing costs and medical activity profile.

lity is integrated in the institution and either shares operating theatres, equipment, staff and infrastructure with the hospital or has to a greater or lesser extent its own facilities. The second type of hospital-based facility is self-contained and sited on the campus of the institution or, exceptionally, as a free satellite at a limited distance from the hospital.

For medical and for budget-saving reasons the satellite version of one-day clinics is excluded by the National Council of Hospital Affairs at the Ministry of Health (1992), that defined the one-day clinic locally and functionally to be a part of the hospital for planned medico-specialist procedures within the pluridisciplinary framework of hospital activity. After the introduction of yearly quatum hospitalization days for every hospital to treat inpatients, the policymakers considered the overhead expenses of the one-day clinic covered, and decided in 1986 to pay for ambulatory surgery only by fee for service, together with a percentage of the individual hospitalization day price for personnel costs. So only for a limited list of surgical interventions can the hospital charge a small (mini), medium (maxi) or large (super) forfeitary sum to cover its hotel costs according to the size and complexity of the ambulatory care provision.

In Table 2 the evolution of total day-care practice in Belgian hospitals is shown, based on the number of these forfeitary nursing cost reimbursements by health insurance companies. Less than 40% of these numbers

concern surgical procedures, with the majority being smaller interventions (skin lesions, orodental surgery); the rest covers medical and diagnostic procedures (endoscopy, imaging) carried out in the one-day clinic. So the physician has, since 1986, as a result of economic considerations, preferred ambulatory procedures for transtympanic ear drum, gingivectomy and surgical tooth extractions among the provisions with a small forfeitary sum, for cystoscopy, vasectomy and adenoidectomy among the provisions with an intermediate forfeitary sum, and for curettage, colonoscopy and circumcision, among the list of provisions with a high forfeitary price. But on the contrary varicectomy of the lower limb or strabismus correction (intermediate sum) and lens extraction or herniorrhaphy (high forfeitary sum) are rarely carried out in day surgery, because the working costs are not completely covered.

This method of financing ambulatory surgery – a fee for service for the procedure that is the same for in- or outpatient treatment plus a percentage of the hospitals' day price – did not give administrators or physicians an incentive to develop one-day clinic activities.

Major obstacles to day surgery development

Since there is not perfect accord between the real costs of some surgical procedures done on an outpatient basis and the forfeitary day price compensation, the hospital is not fully rewarded for this activity and will oppose most one-day clinic initiatives by the surgeon. Only hospitals that are faced with insufficient bed capacity and waiting lists for inpatient treatment, have developed ambulatory care spontaneously. This results in high percentages of day care treatment in some hospitals and the complete absence of ambulatory treatment in others for the same procedures, a phenomenon indicated previously by Morgan and Beech². At the same time hospitals with excess bed capacity and no day clinic experience are against a supplementary fee for service financing of ambulatory treatment because they might indeed lose patients who will seek ambulatory care elsewhere.

The hospital that actually does start a one-day clinic will be penalized, since the mean length of stay of its remaining inpatient case mix will increase and the hospital therefore takes the risk of day quota reduction and even bed reduction by the Ministry of Health. The institution is not compensated for the increased severity of the same diagnosis-related group (DRG) population needing inpatient treatment, and the ambulatory activity is not calculated within the total hospital profile, that will partially determine the per diem price (nursing cost and hotel cost). The combination of these elements has led to a negative selection of minor procedures (especially diagnostic) that are sufficiently covered by forfeitary payment and doctor's fee, but can be easily carried out in any ordinary doctor's office.

The physician in his turn is also less inclined to expand his ambulatory surgery activities. The absence of guidelines and of a legal basis for day care activity creates a liability risk and an atmosphere of misunderstanding with the patient, the family physician and the health insurer. Expansion of hospital-based activity by the one-day clinic surgeon to extramural ambulatory care, pre- and postoperatively, is not well understood and thus not accepted by the family physician and the other primary care workers, who consider this to be unfair competition in their sphere of activity. Without any financial compensation for his investments in training and infrastructure, and for his extra work in ambulatory treatment organization, the surgeon, fearing the reaction of non-referral by the general physician, has no reason to develop one-day clinic activity against the interests of his hospital administrator.

The possible savings of ambulatory care in this country are not a specific objective for the health care insurer. The lack of financial responsibility with the Belgian official compulsory health insurance companies does not stimulate their interest in day surgery development. The same goes for the majority of patients who are completely covered by third party payers and are fully compensated for sick leave and lost working hours. Ironically enough for the independent workers, who are attracted by one-day clinic treatment, compulsory health insurance for them does not include ambulatory care. Moreover, the health insurer and the patient are not informed by the doctor or the hospital about the possibilities and advantages of ambulatory treatment, since the latter do not benefit from day surgery development under the present circumstances.

Stimulating day surgery development

In order to elaborate a health care policy on ambulatory care the Minister of Health and Social Affairs conducted a pilot study and evaluated the activity of eight one-day clinics during 1990–1991. The final report of this study confirms the results previously published and concludes that ambulatory surgery is safe when organized in a functional relationship with the hospital, is appreciated by the patient, and can produce considerable cost savings. It concerned the data of 11 955 patients (45%

Table 3. Mean reimbursement (in 000s BFrs) for inguinal herniorrhaphy in seven hospital categories inpatient vs. ambulatory treatment (Belgium, 1989)

<i>Hospital category (number of beds)</i>	<i>Procedures</i>	<i>Mean reimbursement</i>
I. <150	926	37.4
II. 150–249	1804	40.5
III. 250–449	2704	40.1
IV. 450–599	730	41.4
V. ≥ 600	378	45.5
VI. Teaching hospital	387	62.5
Ambulatory*	130	15.8

*Procedures in one-day surgery centre.

between 15 and 44, 21% between 45 and 59 and 19% between 60 and 74 years of age) living at a mean distance of 3–10 km from the one-day clinic. Only 91 patients had to stay overnight for medical reasons.

The important potential for cost savings by ambulatory surgery is clearly demonstrated by the mean reimbursement amounts for inguinal herniorrhaphy⁴. The mean health insurance costs of herniorrhaphy increase with the size of the hospital from 37 400 to 62 500 BFrs for inpatients against 15 800 BFrs mean reimbursement for ambulatory treatment (Table 3). These important differences in total reimbursed amount for the same procedure on a comparable patient are partially due to the higher per diem price of larger hospitals, but can also be explained by the use of more laboratory tests, medical imaging and drugs, in proportion to hospital size.

During 1992 the National Council for Hospital Affairs of the Ministry of Health accepted a set of rules for the accreditation and functioning of ambulatory care centres. So the legal framework for one-day clinics can be build and an answer can be given to problems concerning structure, process, responsibility and liability. In the development of day surgery the health authorities and the social health insurance companies follow different options. The first prefer accreditation of one-day clinics and financing by subsidization (infrastructure) plus an adjusted individual per diem price (working costs) for each hospital. The health insurers want to avoid overregulation and propose financing ambulatory care by combined remuneration of the doctor (fee for service) and of the family physician (post care) together with a uniform compensation for nursing cost regardless of the type or size of the institution. Only because the hospital is not actually completely compensated for all costs of ambulatory treatment and for the proportionally heavier inpatient case mix, is there no need to subsidize and finance the construction and functioning of a one-day clinic in every hospital in Belgium.

Most hospitals have enough facilities and infrastructure to continue and develop ambulatory treatment, but they have to be compensated according to the real costs. This means payment for working costs of the one-day clinic and compensatory payment of severity-adjusted DRG's for hospitalized inpatients. Also the ambulatory activity of the hospital should be calculated in the total

hospital profile with adjustments for the mean length of stay of inpatient patients. On the other hand a reduction in bed capacity and inpatient day-quota has to be imposed upon the hospital with insufficient occupation rates and excessive lengths of stay, that deliberately does not develop ambulatory treatment for minor routine surgical procedures.

For the doctor a specific fee is proposed to cover his extra costs of investment in skill and organization in performing diagnostic and therapeutic procedures on an ambulatory basis. Special attention has to be given to prevent lucrative selection and hazardous practice in the one-day clinic by medically sound guidelines, quality assessment and correct financing of inpatient cost.

Only by creating a minimum financial responsibility for the health insurer, will the latter be interested in the possible budget savings of day surgery. In order to employ the means of modern medicine and anaesthesiology the insurer can stimulate preferred ambulatory care by increased reimbursement rates.

The report in 1993 by the Minister of Health and Social Affairs accepted experiment that was integrated into the framework of the negotiated national agreement between hospitals and health insurers, provides an example of such preferential reimbursement policy⁵. In this experiment for a selected number of surgical procedures that are frequently carried out on an ambulatory basis in some hospitals, but always seem to need admission for several days in others, the hospital administrator can charge two to five times a forfeitary pro diem price when the intervention is done in day surgery. This multiplied day price is calculated upon the mean length of stay for the same procedures, when carried out with hospital admission. So the ambulatory inguinal herniorrhaphy entitles the hospital to charge five forfeitary pro diem prices to the insurer, because the mean duration of

admission in 1992 for this procedure was five days. The mean total reimbursement for inguinal herniorrhaphy in the one-day clinic will thus be comparable with the reimbursement in the above-mentioned first hospital category (Table 3). It will soon become clear how many of the selected procedures (see Table 1) will have been shifted from the inpatient to the outpatient list and from one institution (unable or unwilling to provide ambulatory surgery) to another.

Until now it has not yet been clearly established how the patient himself can be optimally motivated to choose the one-day clinic. Probably a policy of complete and sustained information about the advantages of ambulatory surgery, directed at the patient, his immediate environment and his family physician might be a good start.

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Outpatient laparoscopic sterilization: is local anaesthesia better?

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A prospective, randomized study comprised 125 outpatient laparoscopic sterilization patients who had received either general anaesthesia or local anaesthesia together with intravenous sedation. The patients who had received local anaesthesia suffered significantly less postoperative pain and sore throat. Recovery and discharge were similar in the two groups, but those given a general anaesthetic were more drowsy in the evening on the day of operation. The time spent in the operating theatre was significantly shorter for the group given local anaesthesia, and the costs were lower. The majority of patients from both groups would prefer local anaesthesia for a similar procedure in the future. We conclude that local anaesthesia together with intravenous sedation is the method of choice for laparoscopic sterilization.

Key words: General anaesthesia, local anaesthesia, laparoscopy, sterilization, outpatient

During the last 20 years, voluntary sterilization has emerged as the most common method of family planning worldwide¹. In the future, reduced economic resources for non-vital health care may compromise sterilization services. We therefore face an increasing demand to supply this service with higher efficacy, shorter recovery time, and reduced costs. Safe and acceptable anaesthesia is mandatory. Most of the major complications of female sterilization result from general anaesthesia or from heavy sedation during local anaesthesia¹. New short-acting drugs have been introduced recently for both general anaesthesia² and sedation in combination with local anaesthesia. We conducted this study to characterize the safety, acceptability, and economy of local vs. general anaesthesia for outpatient laparoscopic sterilization.

Materials and methods

The study was approved by the Ethical Committee of the region and performed according to the Helsinki declaration. All women admitted to our department for outpatient tubal sterilization during an 11-month period were asked to participate in the study. All the patients received midazolam 0.1 mg kg⁻¹ intramuscularly for premedication. They were randomly allocated to the use of either

local or general anaesthesia just before the start of the procedure.

Local anaesthesia (LA group)

The patients received midazolam 0.05 mg kg⁻¹ iv before being prepared and draped in the dorsolithotomy position. Alfentanil 0.01 mg kg⁻¹ was given iv 1 min before the gynaecologist infiltrated the infraumbilical area with 15–20 ml of lidocaine 10 mg ml⁻¹ with adrenaline (5 µg ml⁻¹). An additional dose of alfentanil 0.01 mg ml⁻¹ was given before the peritoneal cavity was insufflated with carbon dioxide. The trocar was introduced, the peritoneal cavity visualized and 5–10 ml bupivacaine 5 mg ml⁻¹ was applied directly to each tube. Sterilization was performed by bipolar coagulation. The patients breathed room air in the first part of the study ($n = 43$) supplemented by 3 l oxygen min⁻¹ through nose catheter in the last part ($n = 22$).

General anaesthesia (GA group)

Anaesthesia was induced by alfentanil 0.01 mg kg⁻¹ iv and propofol 2.0 mg iv. Muscle relaxation and intubation were accomplished with atracurium 0.4 mg kg⁻¹ iv. Just before start of surgery the patients received alfentanil 0.01 mg kg⁻¹ iv. Anaesthesia was maintained with propofol iv infusion at a rate of 10 mg kg⁻¹ h⁻¹ for 10 min, reduced to 8 mg kg⁻¹ h⁻¹ thereafter. The patients were ventilated with 30% oxygen in air. By the end of surgery the propofol infusion was terminated and the patients

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Table 1. Observed and reported peroperative discomfort in the local anaesthesia group

	None %	Slight %	Medium %	Strong %
Observed discomfort				
Gynaecological examination	71	26	3	0
Local analgesia injection	82	18	0	0
Insufflation of CO ₂	73	17	0	0
Tubal diathermy	55	42	3	0
Movements on the table	71	29	0	0
Reported discomfort				
On recovery ward	62	30	5	3
In questionnaire	65	24	8	3

Table 2. Laparoscopic sterilization time

	General anaesthesia (n = 60)	Local anaesthesia (n = 65)	P
Preoperative time (fixed)	10	10	
Surgery time	16 ± 3 (12–23)	17 ± 4 (10–26)	NS
Post-surgery time	8 ± 3 (3–15)	3 ± 1 (1–7)	<0.0001
Total time	34 ± 1 (25–42)	30 ± 4 (19–36)	<0.0001

NS = not significant.

Data are presented as mean ± standard deviation (range), in min.

received neostigmine 2.5 mg and glycopyrrolate 0.4 mg iv.

All the patients were monitored with continuous ECG and pulse-oxymetry as well as regular blood pressure readings. The technique of surgery was the same in the two groups and the surgeons were all qualified gynaecologists. In the recovery room the patients were observed by a nurse who did not know the method of anaesthesia. The patients were discharged to the ward when they were mentally oriented and able to walk. In the afternoon they were discharged from the hospital when they wanted. One week after surgery, the patients returned a standardized questionnaire about their experience of the hospital stay as well as function and side-effects after discharge. They were assigned a wakeness score in the evening, a daylife-function score in the evening and day after, and an activity score the day after the procedure³.

Statistical evaluations were performed with Mann-Whitney test. $P = 0.5$ was regarded as the limit of significance.

Results

One hundred and fifty patients were asked to participate in the study. Twenty-five did not want to be included because they had specific anaesthesia preferences: 11 preferred local and 14 general anaesthesia. None were excluded after inclusion. There were no complications and no patients were readmitted. There were no differences in demographic data between the groups, mean age

was 39 ± 4 yr (mean ± standard deviation) mean weight 64 ± 9 kg. Patients in both groups were insufflated with 3.3 ± 1.0 l carbon dioxide.

Peroperative data

The observed peroperative discomfort was modest in the LA group (Table 1), but one in ten women characterized her discomfort as medium (8%) or strong (3%) in the post-surgery questionnaire. In the GA group no discomfort or awareness was observed or reported.

The effect of iv sedation in the LA group varied: 40% were awake all or most of the time, 41% were asleep during most of the procedure and 19% were partially asleep, partially awake.

Apnoea, defined as oxygen saturation at or below 85% in 30 s, was recorded during induction in 8% of the GA group. Because we recorded apnoea in 28 of the first 43 cases in the LA group (65%), the subsequent patients received oxygen 3 l min^{-1} through a nasal catheter. In that group, apnoea was recorded in three women (14%). We found recurrent apnoea (oxygen saturation less than 90%) in five out of the first 43 cases (12%), but in none of the 22 women with a nasal catheter.

The preoperative procedure time was fixed and the surgery time was almost equal in the two study groups (Table 2). The post-surgery time was, however, significantly shorter in the LA group. The cost of drugs and anaesthetic disposable equipment was 2.2 times higher in the GA group than in the LA group (£26 vs. £11).

Table 3. Abdominal pain and discomfort after laparoscopic sterilization

	General anaesthesia (n = 60) %	Local anaesthesia (n = 65) %	P
Abdominal pain in the hospital			
Observed by the nurse	53	22	<0.001
Experienced by the woman	80	33	<0.0001
Analgesics administered*	33	14	<0.01
Sore throat observed			
In operating room	8	0	<0.05
In recovery room	10	0	<0.05
Reported by the woman	70	3	<0.0001

*In the general anaesthesia group, 85% of the analgesics were opioids; in the local anaesthesia group, 33% were ($P = 0.01$).

Table 4. Time from end of procedure to discharge from recovery and the hospital

	General anaesthesia	Local anaesthesia	P
Recovery time (min)	78 ± 44	71 ± 38	NS
Discharge from hospital (min)	273 ± 161	258 ± 72	NS

NS = not significant.

Postoperative data

During the postoperative hospital stay, the patients in the GA group had significantly more abdominal pain (Table 3) and received more and stronger analgesics. There was no difference between the groups in terms of shoulder pain, headache, nausea, or abdominal pain after discharge. Sore throat was reported more commonly among the intubated women (70% vs. 3%, Table 3). In the total series, postoperative nausea was reported by less than 10%, headache by 3%, and shoulder pain by 8% during hospitalization.

There was no difference between the groups in time of discharge from the recovery ward or discharge from the hospital (Table 4). The patients in the LA group were significantly more awake at home in the evening, wakefulness score of 4.3 ± 1.4 vs. 3.6 ± 1.4 ($P < 0.02$, wakefulness score 1–5; 1 = asleep all the time, 5 = awake all the time).

In spite of preoperative instructions, 40% of the patients travelled home alone, including 4% who drove their own car. Thirty-five per cent of the patients were alone at home for periods after discharge.

When asked after surgery whether the experience had been better, the same or worse than expected, 26% in the GA group and 36% in the LA group characterized it as better, 55% and 46% as equal, 19% and 18% as worse, respectively. In the LA group, 63% said they would prefer local and 20% general anaesthesia for a similar procedure in the future. In the GA group, 48% said they would prefer local and 21% general anaesthesia. The majority (81%) would prefer to be outpatients for a similar case, 15% would prefer to stay until the day after, 3% would prefer admittance the day before, whereas one

patient (1%) would prefer to stay in hospital both the night before and the night after the procedure.

Discussion

Both local anaesthesia with sedation and general anaesthesia proved to be safe and acceptable for the patient, the anaesthetist and the gynaecologist.

The main problem with local anaesthesia is the potential of patient discomfort during the procedure. Although many (42%) of our LA patients experienced discomfort, the discomfort was tolerable and comparable with the discomfort of the gynaecological examination at the start of the procedure. Discomfort may be controlled by iv sedation, but large doses of long-acting drugs may impair respiratory function or delay recovery. The occurrence of apnoea in the LA group is probably a result of the respiratory depressant action of opioids and benzodiazepines in combination. The respiratory stimulation from hypercapnia is more resistant to these drugs than is the stimulation from hypoxia⁴. Thus, administration of oxygen maintains an adequate level of oxygen in the blood until the hypercapnia response is activated. An important aspect is to titrate the iv sedation after clinical response. In our study all patients received a standard dose with large variations in effect. In the clinical situation, careful titration is recommended.

Improved analgesia in the first postoperative period in the LA group may be explained by the local anaesthetic drug effect on the tubes and the operation wound. This is confirmed by successful reports upon the application of local anaesthetics to the tubes in cases of general anaesthesia⁵. Apart from pain and sore throat after intubation, nausea and vomiting are the most frequent side-effects

after day-surgery laparoscopy⁶. In our study the figures of nausea and vomiting were low, less than 10%; and the patients met the discharge criteria from the recovery ward after 71–78 min. Rapid recovery and low incidence of nausea and vomiting is a general feature of regional or local anaesthesia⁷. However, apart from more sleepy patients in the evening, our results in the GA group were equally good in terms of emesis and recovery. The use of short-acting drugs (e.g. alfentanil, propofol, atracurium) is probably important in order to achieve rapid recovery with general anaesthesia^{2,8}. Some studies also indicate an anti-emetic effect of propofol, which may be important⁹.

Although we assigned a fixed time on preoperative preparations, we feel that preoperative preparation and peroperative surveillance is simpler with local anaesthesia than with general anaesthesia. This adds to the measured benefits of less time spent in the operating theatre and less costs of drugs and disposable equipment with the local anaesthetic method.

In spite of preoperative instructions, 40% of the patients travelled home alone. Thus, it seems mandatory to make specific questions about escort when the patients are discharged. This was not done by the hospital personnel during the study period, but is presently checked as a part of the discharge routines.

Our conclusion is that general anaesthesia should be offered on demand. For the great majority, however, local anaesthesia is advantageous: it is preferred by the patients, recovery is quick; the patients are less bothered by pain and sore throat postoperatively and feel more awake at home in the evening. From an economical

point of view, the time spent for surgery is shorter and anaesthesia costs are reduced.

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Cataract surgery in the first ambulatory surgery unit of the Spanish national health system

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Cataract surgery without hospitalization in Spain is a new practice and not very widespread. Here is an analysis of the results of 372 cataract operations in the first ambulatory surgery unit under the Spanish national health system. The patients were selected according to social criteria and general and ocular health. The technique was extracapsular extraction with the intrasacular implantation of the lens. Local anaesthetic was used in all cases except six. The complications were of a similar incidence to inpatient surgery. Two cases required immediate postoperative hospitalization for systemic reasons. All patients whose second eye had to be operated on, again chose ambulatory surgery. Cataract surgery without hospitalization is a safe and satisfactory technique, with a future for expansion, especially in the Spanish health system where its implementation is still minimal.

Key words: Cataract, ambulatory surgery

Introduction

Ambulatory surgery is not sufficiently widespread in Spain. The Hospital de Viladecans has the first Ambulatory Surgery Unit and is one of the few established in the country¹.

Cataract extraction is the most commonly practised operation in our unit (see Table 1). We present the preliminary results after two years of ambulatory cataract surgery practice.

Materials and methods

Patient selection was based on three factors: ophthalmological, social and general health.

1. Ophthalmological factors: adult cataracts without associated ocular pathology which could require combined surgery.
2. General health: using anaesthetic criteria according to the American Society of Anaesthesiology (ASA)². Patients included were those classified as ASA I, ASA II, and stable ASA III.

3. Social characteristics: patients who understand and accept the procedure. Every patient gave his written agreement which manifested complete understanding of the procedure. Patients excluded were those who did not have family support, a telephone at home, or lived in a residence without easy access (for example, in a high-rise building without an elevator) or lived at a distance longer than 15 minutes by car.

A total of 300 patients underwent ambulatory surgery: representing 372 eyes, 51.6% being right eye and left eye 48.4%; 48.7% were men and 51.3% were women. Their ages ranged from 31 to 88 years of age, with an average of 70 years.

The technique used was manual extracapsular extraction, limbal approach, endosacular implant, nylon 10-0 suture, 20 mg subconjunctival gentamicin, 100 mg cefazoline and 20 mg methylprednisolone.

The surgeons were not in training.

There was an absence of associated systemic patho-

Table 1. Main grouped procedures in outpatient surgery at Hospital of Viladecans

Procedures	%
Cataract extraction	25.9
Cystoscopy	11.0
Adenoidectomy	7.9
Pilonidal cyst	4.7

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Table 2. Systemic diseases associated

	%
None	48.3
Arterial hypertension	20.5
Broncopneumopathy	13.2
Diabetes mellitus (non insulin)	4.5
Cardiovascular disease	1.9
Miscellaneous	11.6
Total	100.0

Table 3. ASA American Society of Anesthesiology classification

ASA	No. of cases	%
I	20	5.4
II	274	73.6
III	78	21.0
Total	372	100.0

Table 4. Ophthalmic diseases associated with cataract

	%
None	82.0
Glaucoma*	4.3
Age-related macular degeneration	2.2
Lacrimon obstruction	2.2
Nonproliferative diabetic retinopathy	1.1
Miscellaneous	8.2
Total	100.0

*Primary open-angle glaucoma well controlled.

Table 5. Preoperative visual acuity

Visual acuity	No. of cases	%
80/200–40/200	109	29.3
30/200–20/200	108	29.0
20/200 or minor	155	41.7
Total	372	100.0

logy in 49.3% of the cases. Among the other 50.7%, the systemic disease present (Table 2) was one of the more frequent in the general population, such as hypertension (21.5%), respiratory disease (13.2%), and non-insulin-dependent diabetes mellitus (4.6%). The association of two or more diseases was present in 11.6% of the cases. Twenty patients (5.4%) were classified as ASA I, 274 (73.7%) as ASA II, and 78 (21.0%) as ASA III (Table 3). There was associated ophthalmological disease in 18% of the cases (Table 4) such as well-controlled glaucoma (4.3%), age-related macular disease (2.2%), lacrimal obstruction (2.2%), nonproliferative diabetic retinopathy (1.1%) and other diseases (8.2%). The best corrected distance visual acuity prior to surgery was 0.4–0.2 in 109 eyes (29.3%), 0.15–0.1 in 108 eyes (29.0%), and less than 0.1 in 155 eyes (41.6%) (Table 5).

Table 6. Intraoperative additional medication

Medication	No. of cases	%
None	183	49.2
Anxiolytic	118	31.7
Antihypertensive*	31	8.3
Atropine	13	3.5
Association	27	7.3
Total	372	100.0

*Arterial hypertension.

Table 7. Type of anaesthesia

Type	No. of cases	%
Retrobulbar + facial acinesia	364	97.8
Peribulbar	2	0.5
General*	6	1.6

*Endotracheal intubation.

The patients were asked to attend, without any breakfast, one hour before the time of surgery at the preanaesthetic room. There parenteral premedication was administered (75 mg diclofenac, 150 mg ranitidine, 10 mg metoclopramide) and dilatation drops (tropicamide 1%), fenilephrine 10%, and diclofenac 0.1%, one drop every 15 min). Vital signs were also measured. The anaesthesiologist was the person responsible for deciding on the need for additional medication (Table 6). Almost half of the patients (49.2%) did not need any more drugs. The more commonly used drugs were anxiolytics, such as dehydrobenzoperidol and midazolam, (31.7%), arterial hypotensives, such as nifedipine, (8.3%) and atropine, (3.5%). Two or more drugs were given to the rest of the patients (7.3%).

Retrobulbar anaesthesia was employed in 364 of the patients, using equal parts of 2% mepivacaine plus 0.75% bupivacaine up to a total of 3–4 ml, and hyaluronidase. The method used was retrobulbar plus facial block (modified O'Brien procedure) followed by 15 min of orbital compression using the Gills balloon. Only in six patients was general anaesthesia used because of anxiety or rejection of local anaesthesia (Table 7). Local anaesthesia was carried out by the ophthalmologist.

Once the operation was finished the patient went to the adjoining recovery room. Patients were discharged from hospital approximately 3 h after admission. They were advised to keep to relative rest at home and use oral paracetamol if needed.

Peroperative complications are shown in Table 8. There were no complications in 352 cases. Among the few complications presented, only 4.6% were due to capsular rupture, 1.9% of them being associated with vitreous loss which needed anterior vitrectomy and implantation of lens in sulcus. The cause of immediate hospitalization of two patients was systemic disease. There was only one patient who used the direct telephone because of ocular discomfort.

The postoperative follow-up was for at least three

Table 8. Precocious intra- and postoperative complications (24 h after intervention)

Type	No. of cases	%
None	352	94.5
Posterior capsular rupture*	10	2.7
Vitreous loss	7	1.8
Admitted for systemic complication	2	0.6
Telephone call because of pain	1	0.3
Total	372	100.0

*Without vitreous loss.

Table 9. Late postoperative complications

Type	No. of cases	%
None	319	85.8
Uveitis*	29	7.8
Capsular opacity	8	2.2
Retinal rupture	5	1.3
Suture dehiscence	2	0.5
Glaucoma	2	0.5
Temporal keratopathy	2	0.5
Cystic macular oedema	2	0.5
Subluxated IOL [†] and/or macular hole	2	0.5
Others	1	0.3
Total	372	100.0

*Fibrous pupillar membrane.

[†]Intra ocular lens.

weeks (being at 24 h, 7 days, and 21 days post surgery, which is the same as for inpatients). Postoperative complications are shown in Table 9. There were no postoperative complications in 319 cases (85.8%). Postoperative anterior uveitis with fibrine membrane responsive to topical steroids was observed in 29 cases (7.8%). There remained posterior synechiae in some cases. Complications such as macular cystic oedema, posterior capsular opacity, keratopathy, glaucoma or macular hole were present in 6.4% of the cases, a similar incidence as for inpatients.

We were able to assess final corrected visual acuity in 131 eyes (the rest of the patients were sent to their ophthalmologist) and it was equal to or more than 0.5 in 84% of them.

Every patient operated on for the second eye chose ambulatory surgery as in the first eye.

Discussion

Cataract extraction is suitable for ambulatory surgery³. It is the most commonly practised operation in our unit. Local anaesthesia provides great comfort and a fast recovery although general anaesthesia can be also used. There is no difference among sexes, neither is there a top age limit. Paediatric patients are admitted to the hospital. Very old patients are preferably operated on in an

ambulatory setting because of the need to minimize the separation from their environment.

Social status and family support are the essential factors for patient selection. Systemic disease must be severe or highly altered to hinder ambulatory surgery. Ocular disease is a very rare cause of exclusion and we only eliminated those cases with a history of severe surgical complications in the fellow eye (for example, massive suprachoroidal haemorrhage).

The quality of the technique is more important than the technique used.

The peroperative complications presented at almost the same frequency as in other publications^{4,5}. We think that there could be a direct relationship between the ambulatory approach and a complication such as rupture of the suture (two cases in our study). Maybe the introduction of phacoemulsification could improve the results.

It is important to emphasize the low utilization rate of the direct telephone⁷.

The postoperative phase is almost the same as inpatients who are discharged 24 hours after admission and the medication is also the same. There is a similarity between postoperative complications in ambulatory and ordinary surgery^{6,7,8}. We think that ambulatory surgery is the way forward for cataract extraction because the difficulties are mainly related to hospital management.

In our unit the substitution index for cataracts of inpatient surgery by outpatient surgery is higher than 50%⁹ and is growing.

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The science in day-case tonsillectomy

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An increasing number of tonsillectomies are being performed as day cases in North America and Canada. This paper meta-analyses all such reports. The collective wisdom from these confirms that it is possible to select a group of patients suitable for day-case tonsillectomy in whom it can be performed safely.

Key words: Day-case surgery, tonsillectomy, adenoidectomy

Introduction

Guidelines published by the Royal College of Surgeons of England for day-case surgery in 1985 conclude that removal of tonsils and adenoids is unlikely to be satisfactorily performed as a day-case procedure due to the risk of reactionary haemorrhage. Removal of tonsils and adenoids is one of the commonest operations, 80 970 having been performed in 1985 in England and Wales¹ with an average inpatient stay of 3.1 days. Financial savings are possible if this period can be reduced². However the safety of early discharge in these patients continues to be a source of concern.

Literature review

All published reports where adenotonsillectomies were performed as day cases were reviewed (Table 1). Reports providing insufficient details about the procedure and complications were excluded.

Patient selection

Day-case surgery was considered inappropriate for those with associated medical conditions such as major heart disease, airway disorders, bleeding diatheses and mental retardation. Patients with obstructive sleep apnoea were considered unsuitable by all except Helmus et al.⁵ and Colclasure and Graham³. In addition Shott et al.¹¹ felt children <3 yr were unsuitable. The minimum social criteria before day-case surgery was offered included

adequate adult supervision, easy access to the hospital and a telephone.

Complications

It is possible to select patients with a lower risk of complications. The group considered unsuitable as day cases were operated as inpatients and suffered more complications than those done as day cases. It is therefore possible to screen out a high-risk group. Shott et al.¹¹ found that 26% of the children did not fulfil their criteria for day surgery.

Primary haemorrhage

Between 0.14% and 1.16% patients bled within the first 24 h of operation (cumulative rate 0.5%). Most of these primary haemorrhages were diagnosed before discharge. Three out of 8889 patients had to return to the hospital in the first 24 h because of bleeding. Two were children, one needed an adenoid pack and the other was controlled by local measures to the tonsillar bed. The day cases had significantly less primary haemorrhage than inpatients (Table 2).

Most reactionary haemorrhages in these reports were diagnosed before discharge. This may have resulted from earlier diagnosis due to more vigilant nursing and careful assessment before discharge. Most haemorrhages occurred either before discharge or later than 24 h after operation. Only three children (0.33%) returned to hospital with bleeding within 24 h of operation. These three would have benefited from a longer period of observation. Patients were observed for 2–8 h following operation; Helmus et al.⁵ averaging 4–6 h and Segal et al.⁹ 3 h following adenoidectomy and 3.5 h following adenotonsillectomy.

After the first few postoperative hours, the first post-

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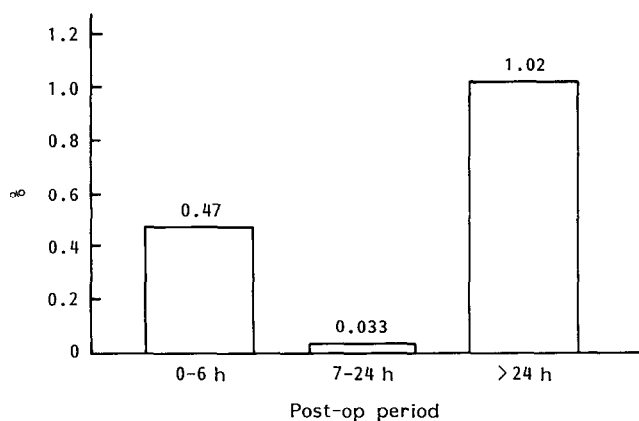
Table 1. Summary of day-case complications

No.	Report & duration of study	No.	Primary Haemorrhage		Secondary Haemorrhage	Nausea/vomiting
			< 6 hr	< 6 hr		
1.	Colclasure & Graham ³ (1990) over 8 yrs	3340	6	1	29	10
2.	Maniglia et al. ⁴ (1988) over 12 yrs	1428	2	0	2	Not reported
3.	Helmus et al. ⁵ (1989) over 2 yrs	1088	9	2	Not reported	108
4.	Riding et al. ⁶ (1990) over 5 yrs	820		7	8*	20**
5.	Reiner et al. ⁷ (1989) over 3 yrs	608	7	0	9	7
6.	Haberman et al. ⁸ (1989) over 4 yrs	500		3	32	3
7.	Segal et al. ⁹ (1983) over 3 yrs	430	5	0	6	Not reported
8.	Wagner et al. ¹⁰ (1990) over 10 yrs	383	3	0	Not reported	12
9.	Shott et al. ¹¹ (1987) over 9 mths	292	0	0	5	3
Cumulative		8889	42***	3	91	163

*Includes inpatients; **Adenoidectomies only, includes inpatients; ***Includes 10 cases of bleeding within 24 h.

Table 2. Day case vs. inpatients (tonsillectomy/adenotonsillectomy) complications

Report	Operation	Primary haemorrhage		Secondary haemorrhage		Nausea/vomiting/dehydration	
4	Day case	1/140	$P = 1$ (NS)				
	Inpatient	2/208					
5	Day case	7/548	$\chi^2 = 5.12$ $P = 0.023$ (Sig.)	9/548	$\chi^2 = 6.92$ $P = 0.008$ (Sig.)	7/548	$\chi^2 = 11.84$ $P = 0.000$ (Sig.)
	Inpatient	13/372		17/372		19/372	
9	Day case	0/292		0/292		3/292	$P = 0.208$ (NS)
	Inpatient	0/192		0/129		4/129	
Cumulative	Day case	8/980	$\chi^2 = 5.17$ $P = 0.022$ (Sig.)	9/840	$\chi^2 = 8.90$ $P = 0.002$ (Sig.)	10/840	$\chi^2 = 15.12$ $P = 0.000$ (Sig.)
	Inpatient	15/709		17/501		23/501	

**Figure 1.** Incidence of haemorrhage ($n = 8889$).

op day is one of the least troublesome periods in adenotonsillectomy convalescence (Figure 1).

Secondary haemorrhage

Between the 2nd and 13th post-op day 0.14–6.4% patients bled. Again, the selected patients who had day-case operations had a significantly lower incidence (see Table 2).

Nausea vomiting and dehydration

Ten per cent of Helmus et al.'s⁵ patients had two or more episodes of vomiting. The criteria for reporting these episodes vary, but up to 3.1% needed treatment (Wagner 1991¹⁰). Day cases had significantly fewer episodes requiring treatment (see Table 2).

Adenoidectomy vs. tonsillectomy

Riding et al. found no significant difference in the rate of complications while Reiner et al.⁷ and Colclasure and

Table 3. Tonsillectomy vs. adenoidectomy (day case + inpatients)

Report	Operation	Primary haemorrhage		Secondary haemorrhage		Nausea/vomiting/dehydration	
1	Tonsillectomy	7/2011	$P = 0.046$ (Sig.)	9/2011	$P = 0.059$ (Sig.)	29/2011	$\chi^2 = 19.32$
	Adenoidectomy	0/1329		1/1329		0/1329	$P = 0.000$ (Sig.)
4	Tonsillectomy	3/348	$\chi^2 = 0.56$	3/348	$\chi^2 = 0.45$		
	Adenoidectomy	13/941	$P = 0.454$ (NS)	5/941	$P = 0.502$ (NS)		
5	Tonsillectomy	20/920	$\chi^2 = 1.86$	26/920	$P = 0.158$ (NS)	26/920	$P = 0.158$ (NS)
			$P = 0.172$ (NS)				
	Adenoidectomy	0/84		0/84		0/84	
Cumulative	Tonsillectomy	30/3279	$\chi^2 = 2.38$	38/3279	$\chi^2 = 14.55$ (NS)	55/2931	$\chi^2 = 26.85$
	Adenoidectomy	13/2354	$P = 0.122$ (Sig.)	6/2354	$P = 0.000$ (Sig.)	0/1413	$P = 0.000$ (Sig.)

Table 4. Adults vs. children (all complications)

Report No.	Children	Adults	Difference	
2	1/290	3/138	(Fisher's)	$P = 0.003$
5	46/807	26/193	$\chi^2 12.94$	$P = 0.0003$
6	14/288	21/212	$\chi^2 4.03$	$P = 0.044$
Cumulative	147/5711	77/926	$\chi^2 80.54$	$P = 0.000$

Graham had no complications following adenoidectomy alone. The cumulative experience shows that adenoidectomy is followed by fewer complications than tonsillectomy or adenotonsillectomy (Table 3).

Adults vs. children

Children had significantly fewer complications than adults (Table 4). Reiner et al. looked at the complications in difference age groups and found that these increased with age.

Discussion

Most episodes of reactionary haemorrhage occur early in the postoperative course and are noticeable before discharge. Maniglia et al.⁴ reported 1428 tonsillectomies, Reiner et al.⁷ 608, Segal et al.⁹ 892, Wagner et al.¹⁰ 383 and Shott et al.¹¹ 292 without any reactionary haemorrhage following discharge as day cases. Early recovery from the anaesthetic and adequate analgesia is essential if patients are to be discharged early. In this practice, induction of anaesthesia with propofol and diclofenac sodium given as a suppository, intraoperatively, has been found to be effective.

Good organization is the key to successful day-case surgery. Very short periods between preoperative assessment and surgery, a day unit run by experienced and efficient staff, assessment before and after operation by a senior anaesthetist and the operating surgeon, and provision of easily accessible back-up are all fundamental to a satisfactory outcome. Day-case surgery is cost saving and has obvious advantages for children and parents. If the low incidence of return to hospital is considered

acceptable then tonsillectomy done as a day-case procedure on selected patients, with vigilant nursing and careful assessment before discharge, does not pose undue risk.

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