

Day Surgery for knee arthroscopy, open hernia repair and laparoscopic cholecystectomy anaesthetic routine and practice: The Results from a Swedish Nationwide Survey

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Abstract

The aim of the present survey was to get an overview of anaesthetic routines in Sweden for three specific cases: knee arthroscopy, herniorrhaphy and laparoscopic cholecystectomy. A questionnaire was sent to all anaesthesiology departments in Sweden. Knee arthroscopy was scheduled as day surgery in all, herniorrhaphy in 70/73 units and laparoscopic cholecystectomy in 34/65 units. General anaesthesia was the most common anaesthetic technique. Pain management was based on paracetamol (acetaminophen)/NSAID/weak-opioid in 95% of units

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with intravenous opioid as in-hospital rescue medication. Take-home analgesics were provided by 71% of units, often including strong opioids. Most common complaints on day 1–2 postoperatively were pain, emesis and wound dressing problems. In conclusion, routines were uniform, but pain is still a major problem, in spite of provision of adequate take-home analgesics.

Introduction

Day surgery, defined as arriving and leaving the hospital on the day of surgery, without overnight stay, has grown dramatically and now accounts for the majority of numbers of performed operations in Europe and North America, >60%. However, routines vary between countries [1–3].

There are many reasons for the increased adoption of day care surgery. Cost reduction is the most important driving factor. Other important factors are also the development of minimally invasive surgery and improved anaesthesia including drugs with rapid offset of action. Also, it may be perceived by patients as an advantage to return to home to a familiar environment as soon as possible. Especially children and elderly are groups that may benefit from early/same day discharge to recuperate in familiar surroundings [4,5]. Nevertheless, early discharge calls for a vigilant plan to ascertain not only safety but also adequate quality of care, e.g. management of pain and nausea and rehabilitation.

The aim of the present survey was to gain an overview of current clinical routines around three explicit surgical procedures in adult patients: knee arthroscopy, herniorrhaphy and laparoscopic cholecystectomy.

Methods

A Swedish national survey was sent to 92 anaesthesia departments in Sweden, regarding their institutional routines at their day surgery units. With this survey, an appended section included questions on

three hypothetical procedure-specific patients' cases. The study was performed during February 2006 to April 2006. The study aimed at patient routines for day surgery performed January – December 2005. Written reminders were sent three times to non-responders followed by a telephone call if the questionnaire was still not returned.

Ambulatory surgery was defined as elective surgery routinely requiring some kind of anaesthesiology service intraoperatively, not scheduled for in-house overnight stay. We wanted the answers restricted to the general consensus of the day surgery unit(s). Most questions had a multiple choice design part with an open subquestion asking for additional information or comments. Several responses could be given to the same question.

The three cases were:

- Patient A: A healthy man, 31 yrs old, undergoing knee arthroscopy after a sports injury.
- Patient B: A man, 74 yrs old, ASA class I–II, undergoing herniorrhaphy.
- Patient C: A woman, 53 yrs old, ASA class I–II, undergoing laparoscopic cholecystectomy.

Questions asked were aimed at whether this particular procedure was performed as day surgery, the standard method of anaesthesia, and routines for pain relief in the PACU and after discharge, regarding type of drug, drug combinations, take-home drugs and prescriptions provided. The same was asked about routines for anti-emetics.

In addition, rates of overnight admission and readmission to hospital

were inquired. For some questions more answers than number of units are provided, as some units gave several alternatives. All questions had the opportunity for the responder to give an extra comment.

All data was entered into a computerized database by an independent assistant and processed using the Statistical Package for the Social Sciences (SPSS version 14.0). Only descriptive statistics were performed including frequency counts, percentages, mean or median value and standard deviation or range. To clarify the varying degree of internal missing data, i.e. not all questions in the questionnaire were responded to, the total number of answers and % of possible given responses are provided, e.g. data on cholecystectomy are given as % of units actually performing cholecystectomy.

Results

The overall response rate to the questionnaire was 88%, 81 of the 92 departments. Seventy-four units responded that they normally performed knee arthroscopy as day surgery, median 100% (range 90–100) of cases. Only one centre answered that they more or less routinely had the arthroscopy patients as in-patients. For herniorrhaphy, 70 units normally performed this as day surgery, in 95% (range 30–100) of their hernia cases, while three units had in-hospital care only. Laparoscopic cholecystectomy was normally performed as day surgery in 34 units and as in-house procedures in 31 units. The rate of day vs. in-house surgery varied between 0 and 100%. Seven units reported all laparoscopic cholecystectomies being performed as day surgery (Table 1).

In 94% of units, an anaesthetist performed preoperative assessments. At 60% of the units, preoperative assessments were performed prior to arrival in the day surgical unit, while at the rest of units this was done at the day of surgery most often just prior to anaesthesia start. Anxiolytic premedication was provided in 38% of units, in a majority of cases with a low dose of an oral benzodiazepine.

Knee arthroscopy was performed under general anaesthesia at 68 out of 74 units and commonly maintained by inhalational anaesthetics.

Anesthesia method was local infiltration anaesthesia/peripheral blocks alone was used only by 4 units, and spinal anaesthesia by two (Table 1). For herniorrhaphy, anaesthesia techniques varied. Local and regional blocks only was the preferred technique at 19 units, spinal anaesthesia at 4 and epidural at one unit (Table 1). Laparoscopic cholecystectomy was always performed under general inhalational anaesthesia, sometimes combined with local wound infiltration or intercostal block (Table 1).

Pain management was generally based on a multi-modal approach, where 94% of units used a combination of paracetamol (acetaminophen) and NSAID/Coxib as basal pain medication. Pain management was initiated prior to surgery with paracetamol (acetaminophen) at 95% and an NSAID at 73% or a Coxib at 15% of units. Written guidelines for rescue pain medication based on pain intensity assessments by VAS score was routine at 85% of units. Most commonly set cut-off for rescue analgesia was a VAS of 33 (44%) or 34 (43%). Immediately postoperatively, classical strong opioids, IV morphine or ketobemidone, were the most commonly used rescue analgesics by 41 and 11 units, respectively. Tramadol was used on a regular basis at 9 units and alfentanil at 4 units.

At discharge, patients were often provided with “take-home medication” as well as a prescription for analgesics. Take-home medication was provided for a median of 2 days, range 1–14, for all three procedures (Table 2). A strong oral opioid was frequently included in the “take-home-medication package” (Table 3). The amount of oral opioids was 4 tablets for knee arthroscopy patients reporting severe pain during recovery and 3 tablets for patients undergoing herniorrhaphy and laparoscopic cholecystectomy, respectively (Table 3). Prescriptions for analgesics were common after all three procedures (Table 2), including a variety of drugs (Table 4).

Only 1 in 5 units provided take-home and 3 in 5 units provided prescriptions for anti-emetics (Table 2).

A regular structured follow-up system covering the first 30 days after surgery including registration of major adverse events and readmission was not standard. Twenty-seven units (34%) had a formal follow-up of admission/readmissions (Table 5). Admissions and readmissions rates were in average low, 2.2% (0–90%) and 1 (0–3%)

Table 1 Routine for three surgical procedures results from the questionnaire survey.

	Knee arthroscopy (n=74)	Inguinal hernia repair (n=70)	Laparoscopic Cholecystectomy (n=34)
Day surgery vs. In-hospital surgery (no of units)	74/1	70/3	34/31
<i>Preferred anaesthetic technique (number of units)</i>			
Regional Anesthesia			
Spinal/ epidural	2/0	4/ 1	0
TIVA	15	6	15
Inhaled GA	41	23	33
GA + local	6	1	0
Local anesthesia / peripheral blocks	4	19	0
Combinations	7	17	2

Table 2 Routines for pain medication following discharge.

	Knee arthroscopy	Inguinal hernia repair	Laparoscopic Cholecystectomy
Take-home only	15	25	9
Prescription only	19	8	5
Both	29	32	17
Anti-emetics take-home only	1	3	5
Anti-emetics prescription only	4	3	3
Both	0	0	2

Table 3 Provision of strong opioids.

	Knee arthroscopy	Inguinal hernia repair	Laparoscopic Cholecystectomy
<i>Opioids provided? (number of units)</i>			
No	40	30	19
Sometimes, "if needed"	34	27	15
Routinely	0	13	6
<i>Number of Tablets</i>			
Median (range)	4 (1-8)	3 (2-10)	3 (2-8)

respectively. The most common cause for admission/readmission was severe pain for all three procedures, followed by micturition problems in herniorrhaphy patients, PONV in cholecystectomy and more extensive surgery for knee arthroscopy (Table 6).

At 40 percent of units, nurses acquired qualitative but not quantitative information by telephone follow-up on day 1–2 after surgery. Problems encountered were mainly related to pain and nausea, related to perceived severity, incidence and number of units reporting it (Fig 1). A common reply on follow-ups was that there were few complications, and that good written information sheet was helpful but could have been more extensive.

Discussion

The present survey of routines for 3 specific cases, displayed a diverse picture, with practice varying considerably between units as well as between surgical procedures. Both knee arthroscopies and herniorrhaphy were predominantly performed as day cases. There was a wide variability between units for hernia repair, while laparoscopic cholecystectomy was routinely performed as a day surgery operation in about 50% of units only. Our frequency data should of course be interpreted with caution, as there are always limitations with questionnaire surveys. We aimed at gathering as robust data as possible by asking for numbers and proportions of surgical procedures from institutional yearly statistics, and by asking that the anaesthetist in charge of the day surgery unit to be responsible for providing accurate information. Our results, showing a diverse adaptation of day-surgery, are much in line with earlier studies and also with the figure provided by the International Association for Ambulatory Surgery [1–3]). Our figures are also coherent with official figures from the Swedish Health Authority Board [6]. Knee arthroscopy was only rarely scheduled for in-hospital care. Knee arthroscopy has been reported to be safely and effectively managed and can even safely move out of the day surgery unit into the office-based setting [7]. Herniorrhaphy was

mainly performed as day surgery, but the estimated percentage varied considerably between units and the reported routines for doing day surgery laparoscopic cholecystectomy was far lower than figures from the USA [1]. When compared to the figure of 83% reported from Norway, which should be comparable considering general overall health care similarities, our numbers were lower: however, it should be taken under consideration that the Norwegian results are reported from only one centre, specialized in laparoscopic surgery [8]. It is not possible to make any firm conclusion from the present survey as to why the adaptation of day surgery varies. Other authors have also reported great variability in day surgery adaptation between both different areas and hospitals in the same region [9].

General balanced anaesthesia was the most commonly used anaesthetic technique in all three procedures. For elective knee arthroscopy there are studies comparing general anaesthesia to both regional anaesthesia and local anaesthesia only, supporting the use of local anaesthesia without additional drugs for routine meniscus resection or in combination with light sedation when needed (7, 10). For more complex procedures the failure rates with local anaesthesia have been shown to increase [7]. The low use of regional anaesthesia was a change from the results of an earlier Swedish survey from 1995 [11]. Selective spinal anaesthesia has been suggested as an alternative for arthroscopic meniscus resections, but the 2-hour time to home readiness may be considered as too long in many units [12]. Two of the reason for the common use of balanced general anaesthesia are difficulties in predicting when local anaesthesia will be insufficient and the rapid onset as well as fast recovery associated to modern general anaesthetics, in line with the British routines [13].

For herniorrhaphy, more diversity was found in choices of routine anaesthetic techniques. A number of different methods have been suggested. Some studies advocate local anaesthesia with or without add-on general anaesthesia [14, 15]. Local infiltrational anaesthesia is becoming increasingly popular, but is used as a main anaesthetic only in a few units. Similarly to knee arthroscopy, spinal and epidural

Table 4 Drug choices for analgesics.

	Type of surgery		
	Knee arthroscopy (n=74)	Inguinal hernia repair (n=70)	Laparoscopic Cholecystectomy (n=34)
Analgesics			
Take-home analgesics			
Paracetamol	39	51	22
NSAID	36	39	15
Coxib	1	1	2
Dextropropoxyphen	6	10	5
Codeine	5	7	0
Tramadol	11	13	5
Oxycodone	0	11	7
Choice of strong opioid if needed (no of units)			
Oxycodone	16	22	14
Morphine	1	2	1
Ketobemidon	4	7	5
Prescription analgesics			
Paracetamol	24	25	17
NSAID	34	23	20
Coxib	1	1	3
Dextropropoxyphen	1	2	1
Codeine	6	5	0
Tramadol	12	13	7
Non-specified weak opioid	-	-	9
Ketobemidone	1	1	2
Oxycodone	3	4	1
Non-specified strong opioid		5	3

Table 5 Day surgery units recording unplanned admissions and readmissions.

Yes	27 (34%)	
No	33 (42%)	
Missing	19 (24%)	
Specialty	Admissions	Readmissions
Surgery	4% (range 0–90%)	1% (range 0–3%)
Orthopaedics	2,8% (range 0–7%)	1% (range 0–2%)
Gynaecology	2,2% (range 0–11%)	1% (range 0–1%)

anaesthesia were uncommon. Spinal anaesthesia has been associated with delayed discharge [16], as reported from two units in the present study where this was an important reason for overnight admission. Inhalational anaesthetic technique with an IV induction and the use of laryngeal mask airway is a simple, safe and cost effective technique allowing rapid discharge [17]. Laparoscopic surgery requires general anaesthesia and intubation is still preferred although papers describing positive experience from the use of laryngeal mask airway have been

published [19]. Unfortunately, we did not include more explicit questions around other adjunct drugs in the perioperative period that have shown to have major positive influence on recovery and patients' satisfaction [20].

A pain management regime based on a combination of analgesics, in accordance with abundant evidence-based recommendations, improves efficacy and reduces adverse effects [21]. Both herniorrhaphy and laparoscopic cholecystectomy are included in the PROSPECT

Table 6 Readmissions.

<i>Herniorraphy (noted by 19 out of 27 units):</i>	
Most important symptom causing readmission	no of units
pain	5
micturition difficulties	4
bleeding	2
social issues	3
late hours	2
dizziness	1
PONV	1
extended surgery	1
<i>Cholecystectomy (noted by 8 out of 27 units)</i>	
Most important symptom causing readmission	no of units
pain	3
PONV	4
extended surgery	2
fatigue	1
late hours	1
dizziness	1
<i>Knee arthroscopy (noted by 12 out of 27 units)</i>	
Most important symptom causing readmission	no of units
pain	3
extended surgery	3
suspected infection	2
PONV	2
mobilisation difficulties	1
extended spinal block	1
dizziness	1

library on procedure-specific pain strategies, and both include local anaesthesia, paracetamol and NSAID as basis for the pain management [22–24]. It was also reassuring to note that a majority of units had routines both as to evaluation of pain and provision of intravenous rescue analgesia while in hospital. Provision of take-home medication was surprisingly common but the amount of tablets and the selection of analgesics varied considerably. Even strong opioids were, however, not uncommonly provided after hernia repair as well as after cholecystectomy. This has been considered effective and safe also in the ambulatory setting [25]. Still, admission/readmission was frequently associated to pain and need for supplemental analgesia. Structured follow-up was infrequent and it is therefore impossible to evaluate perioperative care vs. outcome. Approximately 50% of units had some form of nurse-performed telephone follow-ups on postoperative day 1–2 providing more of qualitative than quantitative information. Interestingly, in spite of the fact that patients to a large extent received a take-home package of analgesics, often including strong opioids, and that they were provided with a prescription including weak as well as strong opioids, postoperative pain was a common problem encountered on phone follow-up. It is of course not possible to give any explicit reason for the commonly addressed

pain queries. The main pain problem is known to often occur after discharge, when perianaesthetic analgesia has worn off and patients begin to mobilise [26]. Contributing factors may be that the information on how to take analgesics is often sparse, and yet of great importance for patient treatment compliance. The importance of adequate and extensive information to the daysurgical patient has been emphasised repeatedly and further improvements in patient preparation and information indeed seem warranted [27, 28]. In addition, postoperative nausea and vomiting (PONV) was a frequent complaint at follow-up. Provision of take-home and or prescribe anti-emetics was far more neglected than pain medication and further efforts in the management of PONV should be taken. In fact, PONV was noted as an important reason for hospital admission and readmission.

In Sweden 2005, day-surgery practice for the three procedures studied varied; with knee arthroscopy and herniorraphy almost routine as day-surgery while laparoscopic cholecystectomy was still often scheduled as an in-hospital procedure in about 50% of units. General balanced anaesthesia was the most common anaesthetic technique but local anaesthesia with adjunct sedatives was becoming increasingly popular for knee arthroscopy and herniorraphy. The

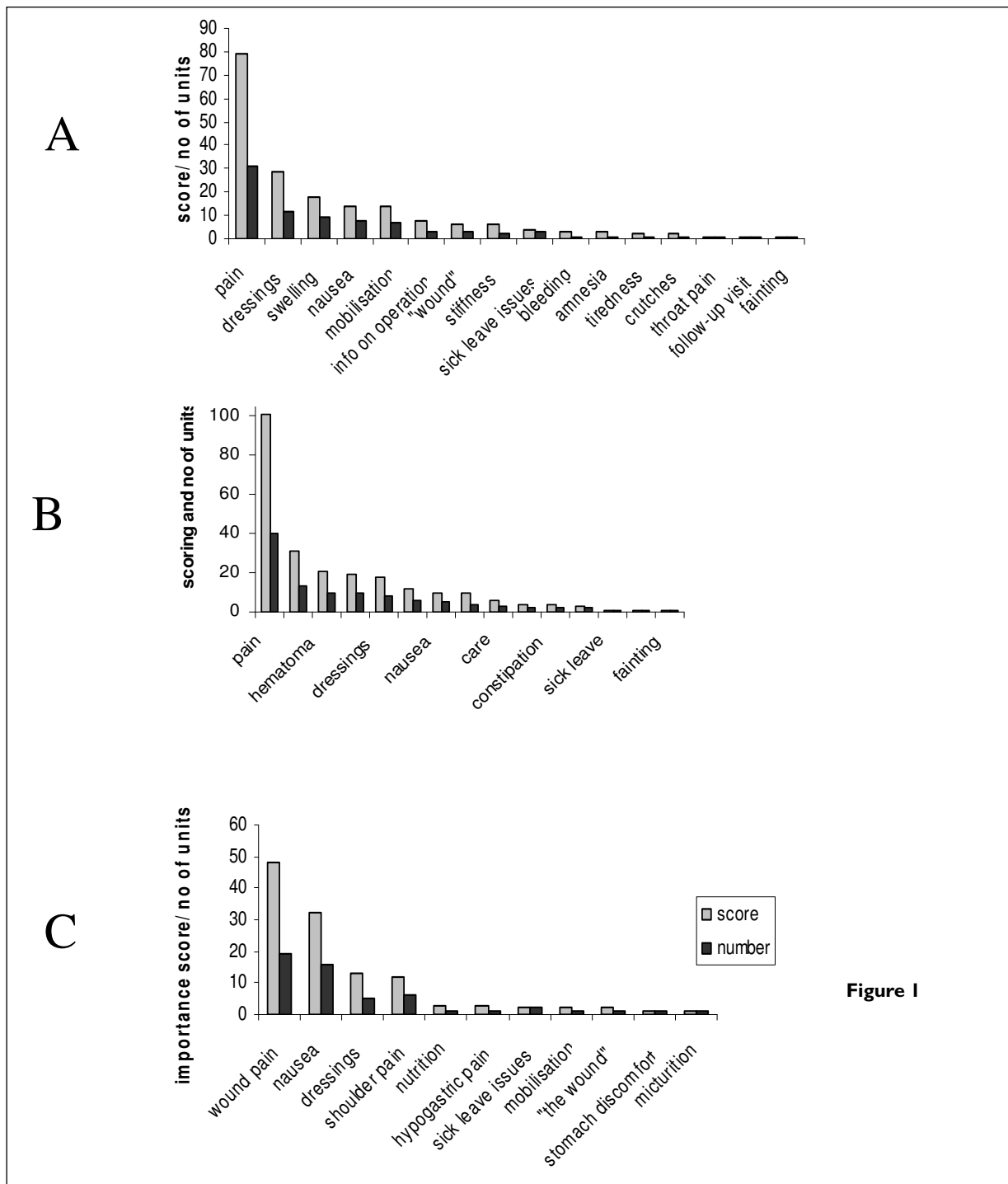


Figure I

awareness and attitude towards pain is reassuring, and take home medication, including strong oral opioids when needed, is commonly provided. There is however room for improvement in structured outcome follow-ups in order to evaluate and compare practices. From the qualitative data gained on phone-follow-up improvement in information around the overall postoperative course including clear guidance for pain management, prophylaxis and treatment of PONV, wound care and rehabilitation are warranted.

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