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Three years of institutionalized paediatric day case surgery: organization – indications – frequency – complications

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In the last seven years, the number of surgical procedures which are performed as day case surgery for infants and children has increased dramatically. Day case surgery should be able to be conducted effectively, with few complications, while saving time and money but also providing a pleasant atmosphere for the children and their parents. Since 1990, we have been practising day case surgery in the Department of Paediatric Surgery at the University of Tübingen twice a week. We have a special unit for this purpose with a team of day care personnel, paediatric nurses, anaesthesiologists and paediatric surgeons. The total number of operations performed in our department from 1990 to 1992 was 5330. Of these, 2111 (39.6%) were conducted as day case surgery for children of the ages six weeks to 20 years. The series includes 44 umbilical hernias, 385 phimoses, nine cervical cysts, 399 inguinal testes, 857 inguinal hernias, 90 hydroceles/funiculoceles, 19 haemangiomas, 43 meatotomies, 95 endoscopies and 170 other operations. Postoperative complications were defined as secondary haemorrhage, fever, obvious vomiting and urine retention. In a total of 35 (1.66%) children, the complications necessitated a stay in the hospital of up to eight (average 2.17) days, despite day case planning of the surgical procedure. Our experience shows that a large number of paediatric surgical procedures can be performed as day case surgery. Nevertheless, even with an expanded spectrum of possible operations there must always be ward capacities available in order to monitor and treat complications adequately.

Key words: Paediatric day case surgery, organization, indications, frequency, complications

Introduction

The number of operations in childhood that are planned as day case surgery has increased considerably in the past seven years[1,7]. The requirements for performing surgery in this manner are often fulfilled by infants and children, namely the classification as ASA Groups I and II, as well as minimally invasive operations which are not very time-consuming. The advantages of day case surgery include substantial reduction in costs as well as avoiding the separation of the child from their family in the pre- and postoperative phases[2,3]. A few hours after general anaesthesia has worn off, the children can leave the hospital to return home with their parents. Day case surgery should be able to be performed effectively, with minimal complications, and economically in a reasonably short amount of time. It should also take place in an atmosphere that is pleasant for the children and their parents. We have been conducting day case surgery since 1990 in the Department of Paediatric Surgery at the University of Tübingen on two week days. We have a unit specially equipped for this purpose with a team of kindergarten teachers, paediatric nurses, anaesthesiologists and paediatric surgeons.

Patients and methods

This prospective investigation includes all infants older than 6 weeks as well as all children for whom surgery was planned as day case surgery in the period from 1990 to 1992 in the Department of Paediatric Surgery of the University of Tübingen. The indication for surgery was established by preliminary examination in our clinic, at which time surgery was scheduled and anaesthesia examination performed. In addition, the parents received

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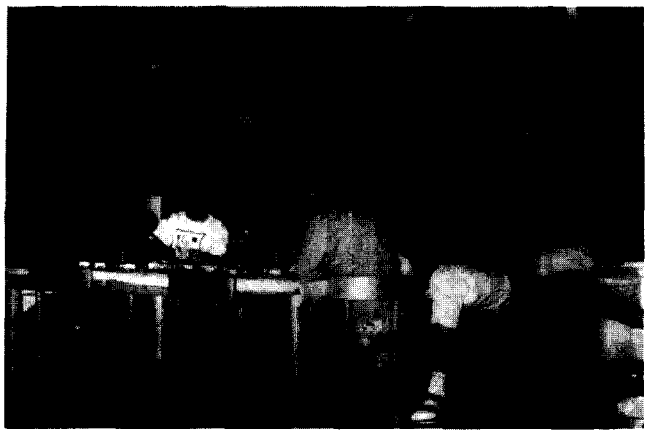

Figure 1. Playroom.

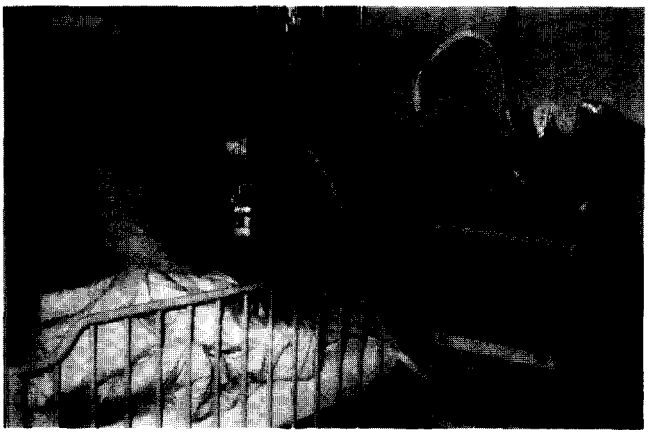

Figure 3. Recovery room.

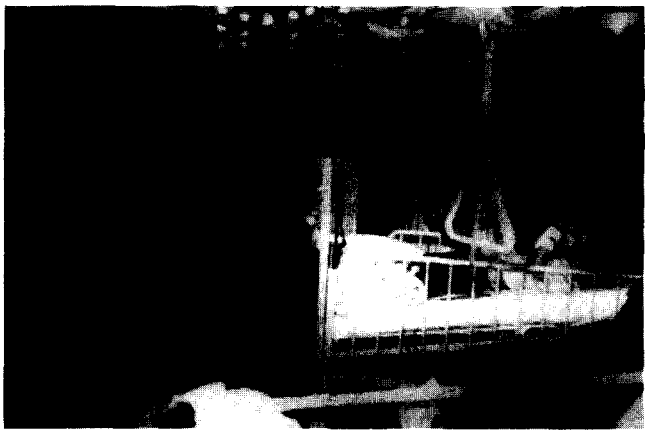

Figure 2. Playroom.

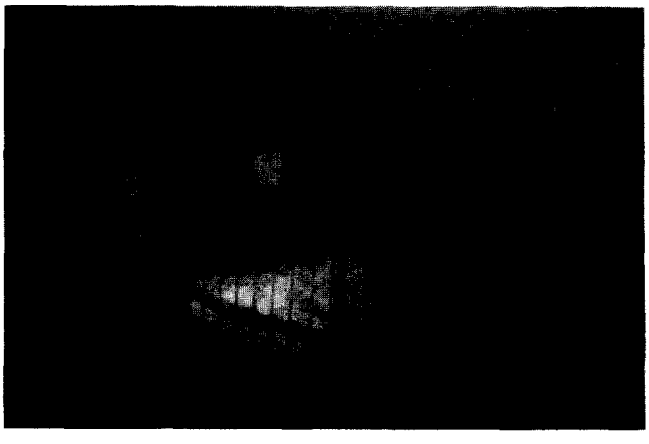

Figure 4. Ward.

detailed written information on the course of events on the day of surgery.

All children and infants were re-examined in our clinic on the morning of scheduled surgery and the parents had another opportunity to ask detailed questions about the operation or anaesthesia. At this time the infants and children were in a fasting state. They could pass the time waiting for surgery in the playroom with their parents, the kindergarten teachers and inpatients (Figures 1 and 2).

Twenty minutes before the children were scheduled in the operating room, all who were older than 1 year received oral premedication (midazolam, 0.4 mg kg^{-1} bw^{-1}). Surgery was conducted under halothane-N_2O anaesthesia after mask induction. The infants and children were brought into the recovery room after surgery, where they could be observed in the presence of their parents until transfer to the ward (Figure 3). On the ward they continued to be observed regularly. They were finally released 4–6 hours after surgery as long as no complications had occurred (Figure 4).

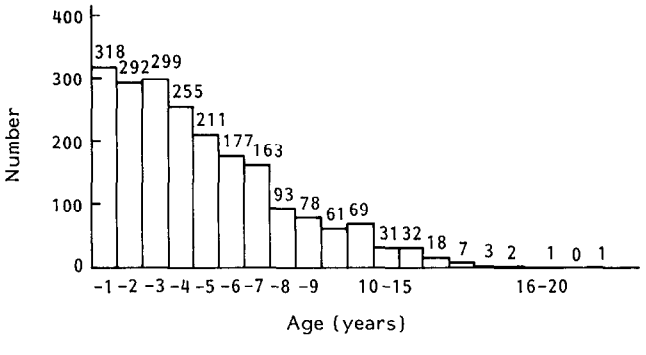

Figure 5. Age at the time of surgery.

Results

The total number of operations performed in our department from 1990 to 1992 was 5330. Of these, 2111 (39.6%) were planned as day case surgery for infants and children of ages six weeks to 20 years (Figure 5); 1666 were male and 445 female (3.7 : 1) (Figure 6).

The series includes 44 umbilical hernias, 385 phimoses,

Figure 6. Distribution of gender. Female : male = 1 : 3.7; n = 2111.

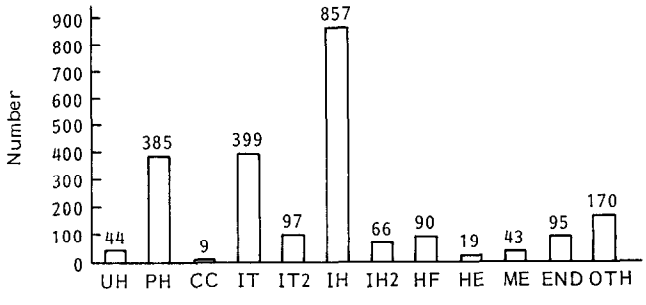

Figure 7. Diagnosis/operations. UH = umbilical hernia; PH = phimoses; CC = cervical cysts/fistula; IT = inguinal testes; IT2 = bilateral inguinal testes; IH = inguinal hernia; IH2 = bilateral inguinal hernia; HF = hydroceles/funiculoceles; HE = haemangioma; ME = meatotomy; END = endoscopy; OTH = other operations.

nine cervical cysts and fistulas, 399 inguinal testes (97 of these bilateral), 857 inguinal hernias (66 of these bilateral), 90 hydroceles/funiculoceles, 19 haemangiomas, 43 meatotomies, 95 endoscopies, and 170 other operations (Figure 7). Table 1 gives an overview of the 170 other operations.

Postoperative complications were defined as secondary haemorrhage, fever, vomiting, urine retention and laryngospasm upon terminating anaesthesia. Occurrence of such complications necessitated a stay in the hospital of up to 8 days (average 2.17 days) despite planned day case surgery for a total of 35 (1.66%) infants and children. The most common complication, observed in 17 children, was repeated postoperative vomiting. Secondary haemorrhage made a change to inpatient status necessary in five cases. Postoperative fever of up to 39.5°C occurred in seven children and three experienced postoperative urine retention. Three children were observed for an additional 24 or 48 hours, respectively, due to the occurrence of laryngospasm as anaesthesia was terminated and postoperative vomiting (Table 2).

Table 1. Other operations

Diagnosis	*Type of operation*	*No.*
Small soft tissue tumours	Extirpation	83
Susp. Hirschsprung's disease	Suction biopsy of rectum	23
Snapping thumb	Incision of annular ligament	14
Ingrown toenail	Emmet's operation	10
Neurogenic bladder	Suprapubic drainage	1
Foreign body	Removal	7
Shortened frenulum of tongue	Separation	12
Lymphoma	Biopsy of lymph node	12
Agenesis of testis	Prosthetic testis	1
Port/Hickman catheter	Catheter removal	7

Table 2. Complications

Complication	*No.*
Vomiting	17
Secondary haemorrhage	5
Postoperative fever	7
Urine retention	3
Laryngospasm, vomiting	3

n = 35 (1.66%)

Discussion

Our experience shows that day case surgery can be performed as of the sixth week of life for normally developed infants. Younger infants and those who were born prematurely have potentially immature organs, thus entailing possible complications such as delayed metabolism of inhalative anaesthetics or sleep apnoea. Therefore, a postoperative observation period of at least 24 hours with monitoring of pulse, blood pressure, respiration and blood sugar is mandatory for these patients, thus excluding them from day case surgery.

Day case surgery certainly offers an economic alternative in these times of ever-increasing costs in the health sector. The children, their parents and the physicians involved are generally enthusiastic, yet this fact has not been adequately acknowledged by health insurance agencies or politicians[1,4,5]. Another advantage of day case surgery is of a psychological nature. There is little probability that children involved will develop behaviour disorders of the kind seen in children who are hospitalized longer[6]. On the other hand, after the infants and children are released from the hospital, further observation and pain therapy are left in the parents' hands. This requires detailed instruction and information for the parents with respect to administration of pain medication and to possible complications at home. Despite planning day case surgery, 35 (1.66%) of our infants and children experienced complications which demanded an inpatient stay of up to 8 days (average 2.17).

In summary, our experience shows that a large number

of paediatric surgical procedures can be performed as day case surgery. Nevertheless, with such a widened spectrum one must be prepared for the occurrence of complications and always have capacities free for inpatient care where they can be observed and treated adequately.

References

1 Astfalk W, Warth H, Leriche C. Day case surgery in childhood from the parents' point of view. *Eur J Pediatr Surg* 1991; **1**: 323–7

2 Bar-Maor JA, Tadmor CS, Birkhan J, Shoshany G. Effective psychological and/or 'pharmacological' preparation for elective pediatric surgery can reduce stress. *Pediatr Surg Int* 1989; **4**: 273–6

3 Breitkopf L. Emotionale Reaktionen von Kindern auf den Krankenhausaufenthalt. *Z Kinderchir* 1990; **45**: 3–8

4 Hecker WCh. Ambulantes Operieren in der Kinderchirurgie. *Informationen des Berufsverbandes der deutschen Chirurgen e. V. Nr. 12*, 1979; 187–91

5 Lagrange M. Zum Thema: Ambulante Operationen aus der Sicht des behandelnden Kinderarztes. *Der Kinderarzt* 1989; **1**: 1–3

6 Lempp R. Das Kind im Krankenhaus. *Z Kinderchir* 1980; **30**: 5–13

7 Muir JG. Day surgery in children. *Current Opinion in Anaesthesiology* 1990; **3**: 358–60