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Editorial

Mark Skues, Editor-in-Chief

As the year draws to a close, this edition of 'Ambulatory Surgery' contains three papers considering aspects of paediatric management in the day case environment, as well as a review of the treatment of incisional hernias and outcomes. It is unusual for child care to be considered in such a Journal, but surely, there is no reason why operative intervention cannot be facilitated on the same day as admission and discharge, capitalising on the same tenets of high quality and cost containment with which we are all familiar in adults.

Porrero Carro and colleagues describe an 11 year review of 1251 incisional hernia repairs in their hospital in Madrid, of which, 1081 were analysed. They describe the surgical technique used as well as complications due to surgery. Reassuringly, just 5 patients experienced seroma fomation, one a haematoma and one, chronic neuralgia, all of which settled conservatively. Overall, their ambulatory rates were cited as 23%, which is in accord with English data for 2017/8 where 24.3% underwent similar surgery as a daycase procedure.

Orfanos et al present a one year study evaluating the cost and outcomes of paediatric ambulatory surgery in Greece. Importantly, they also evaluated the financial income of their unit as well as direct and indirect costs, finding a healthy positive balance for the benefits of such care. Theatre staff shortages contributed to their high unplanned admission rates with the day surgery unit being used for more major non-ambulatory procedures.

Chandran reports on a 12 month audit from Kuala Lumpur, Malaysia, evaluating the rates of unplanned hospital admissions for paediatric surgery. He found a pleasingly low rate of 2.4%, the majority of whom had difficulties passing urine post-operatively. A number of these children received either concomitant caudal analgesia of ilioinguinal block, yet there was no residual block apparent after surgery, leading the author to suggest the use of peri-operative fluids to mitigate the issue. All children were discharged well the following day.

Benouaz and colleagues from Algeria implemented a review of paediatric surgical cancellations. They evaluated the causes over a two year period, dividing cancellations into hospital or parent initiated, and then reported on efforts to reduce the rates over the second year. Their results are impressive with a marked reduction in the cancellation rate (from 144 in the first year to 15 in the second), after implementing relatively simple change measures. Here is an example of how a motivated team can make a real difference with issues related to ambulatory surgery by adhering to measures to improve both the quality and efficiency of peri-operative care.

Finally, the programme for the 13th Symposium of the International Association for Ambulatory Surgery has now been published online at www.iaascongress2019.com. It is evident that the wide spectrum of lectures will offer insight on all of the benefits of ambulatory care, making the meeting mandatory for all interested in the speciality. Abstracts can now be submitted online, allowing you to present your own work at this meeting. In the inevitable slow down towards Christmas and the New Year, time to put something together? In the meantime, I hope you have an enjoyable seasonal time, with peace and productivity for 2019.

Mark Skues
Editor-in-Chief

Incisional Hernia in Major Ambulatory Surgery

JL Porrero Carro, C Bustamante Recuenco, O Cano Valderrama, MT Alonso Garcia, MJ Castillo Fe, E Quiros Higueras, S Villar Riu, C Sanchez-Cabezudo Diaz-Guerra, O Bonachia Naranjo, A Marcos Herrero, B Porrero Guerrero, B Ramos Lojo, M Cendrero Martín

Abstract

Aims: To examine the use of the ambulatory surgery unit for selected incisional hernia repairs.
Method: A retrospective study of incisional hernia repairs performed from 01/01/2004 to 31/12/2015. Data were collected regarding: sex, age, previous laparotomy, hernia type, complications and recurrence.

Results: The total number of interventions was 1251. A total of 252 interventions (23.3%) were performed in an outpatient setting. Seven postoperative complications and 20 (8.1%) recurrences were observed.
Conclusions: Incisional hernia repair can be performed in an outpatient setting, as the results of effectiveness and safety are comparable to results obtained for inpatient surgery.

Keywords: eventration, outpatient, mesh repair, sublay, complications, incisional.

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Introduction

Incisional hernia is a common long-term complication after abdominal surgery, occurring in 12-15% of patients and accounting for 50% of all abdominal wall interventions in a General Hospital [1]. Other complications include chronic respiratory failure in severe cases. In general, mortality from the condition is only 0.24%, although, if strangulation occurs, then mortality can be as high as 10% [2]. As incisional hernia is a common condition, it results in a high cost for any healthcare system, estimating an average cost of 4,000 euros (4,705 dollars) per patient when surgical treatment is performed [3].

Incisional hernia repair in an ambulatory setting is possible in selected patients. It has considerable advantages over inpatient surgery, as it minimizes the risk of surgical site infection, reduces the length of hospital stay and minimises the social impact on patients′ daily lives. Importantly, ambulatory incisional hernia repair offers the same effectiveness and safety as inpatient surgery, with similar recurrence and complication rates [4]. Furthermore, it reduces the waiting-list volume and also decreases the economic cost by between 30% and 50% [5].

Given this evidence, we performed a review of all incisional hernia repairs performed at the MAS (Major Ambulatory Surgery) Unit in our hospital to determine its safety and effectiveness, comparing our results with those reported in the current literature.

Methods

A descriptive, observational and retrospective study was carried out on all patients diagnosed for incisional hernia and subjected to surgical treatment in the MAS Unit of the Hospital Universitario Santa Cristina. The study period ran from January 2004 to December 2015.

Inclusion criteria

We included all patients greater than 18 years of age who underwent an elective surgical procedure. All the incisional hernias included met the general criteria defined by national MAS guidelines [1], which are shown in Table 1. Only small or medium sized hernias (with a maximum orifice diameter of 6 cm) were included in the study. This selection was carried out by the consulting surgeon.

Table 1 Selection Criteria.

Medical Criteria
• ASA 1, 2 or stable 3 patients
• Unlimited age , taking into consideration, biological age
• The following patients should only be selected in expert units under a strict protocol
• Insulin dependent diabetics
• Chronically anticoagulated patients
• Stable heart disease
• Physical defect (blindness, deafness)
• Psychological defect (psychiatric disease, mental handicap)
Psychological Criteria
• Comprehension capacity
• Stable personality
• Positive and collaborative attitude
• Voluntary consent
Social Criteria
• Adult monitoring for at least the first two postoperative days
• 60 minutes travel distance from the hospital
• Adequate hygienic domiciliary conditions
Surgical Criteria
• Elective Surgery
• Minimum bleeding risk
• No cavity opening except in laparoscopic procedures
• Early oral tolerance
• Prolonged immobilisation not required
• Postoperative pain properly treated with oral analgesia
• Avoidance of drainage devices

Surgical technique

All the patients underwent an incisional hernia repair using prosthetic mesh. An open approach was used in all cases. The surgical technique was decided intraoperatively taking into account the defect size,

location,and the general condition of the abdominal wall. Thus, the following techniques were used:

a) Ventral hernia repair with a Ventralex or Ventralex ST mesh (Bard Davol, Rhode Island, USA) [Editor's note: Ventralex mesh is currently the subject of a number of lawsuits citing complications such as bowel obstruction, mesh migration, infection and adhesions]. The incision was made over the hernia protrusion, then the dissection of the hernia sac and neck was carried out. Once the sac was released, their contents were taken back to the peritoneal cavity. The mesh was placed in a preperitoneal position in all cases where where posible, otherwise, an intraperitoneal mesh placement was used.
b) Rives technique incisional hernia repair (component separation technique): After the release and reduction (with or without invagination) of the hernia sac, an opening of the rectus abdominis anterior sheath was performed. Then the space between the posterior sheath and the rectus abdominis muscle was dissected until the perforating vessels were clearly seen.

Progrip mesh (Medtronic Minneapolis USA) or Adhesix mesh (Bard Davol, Rhode Island USA) were placed over the defect and fixed at the lateral edges of the muscle. This technique was only performed in selected patients, as it may be unsuitable for patients undergoing ambulatory surgery

Regardless of the technique used, all patients received a compression bandage and abdominal elastic girdle which was maintained for two months. Antibiotic prophylaxis was performed with amoxicillin-clavulanic acid 1G. (single dose). The thromboembolic prophylaxis protocol was always followed with the use of enoxaparin 40mg s/c and the confirmation of early mobilization and adequate ambulation of the patient before deciding its withdrawal.

Collection and analysis of data

The following data was recorded and analysed: age, sex, comorbidities, previous incision (median laparotomy, subcostal, McBurney, pararrectal..etc),type, location and size of the incisional hernia, area of the abdominal wall defect, surgical technique, surgical time, length of hospital stay (days), complication and recurrence rate. A descriptive analysis of the data was carried out, using the STATA Statistics Data analysis software version 22.0.

Results

A total of 1251 incisional hernia interventions were performed, of which only 1081 could be analysed due to absent data. As shown in Figure 1, the number of incisional hernia repairs in our institution has increased considerably from 8 in 2004 to 178 in 2015. Of the 1081 interventions, 252 (23.3%) were performed in an outpatient setting. The percentage of patients successfully managed as daycase has also experienced growth recently, standing at 25.01% in the last 5 years (Figure 2). The patient characteristics were as follows: 106 were male (42%) and 146 female (59%). The mean age was 50.56 years (SD: 12.74). Twenty-eight patients (11%) were smokers at the time of the intervention. and 47 patients were classified as obese (19%), defined as BMI> 30. The prior incision was a midline laparotomy in 42% of cases and a lateral incision in 8%. In the remainder of the patients (50%), the incisional hernia occurred through a trocar port site due to a previous laparoscopic intervention. The majority of hernias were periumbilical in nature with 5 patients having more than one hernia. The average size of the adominal wall defect was 2.70cm x 2.47cm, with a mean area of 8.08 cm^2.

The surgical technique is shown in Figure 3. The preperitoneal ventral hernia repair (74%) was the most frequent procedure, followed by the intraabdominal repair (20.7%). The Rives technique with retromuscular placement of the prosthesis was only performed in 4%

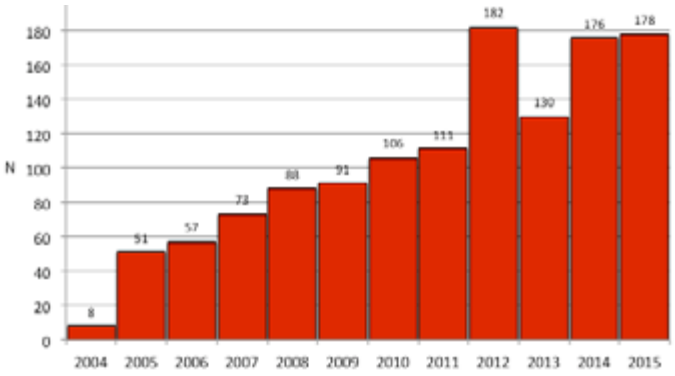

Figure 1 Total number of Incisional Hernia repairs performed.

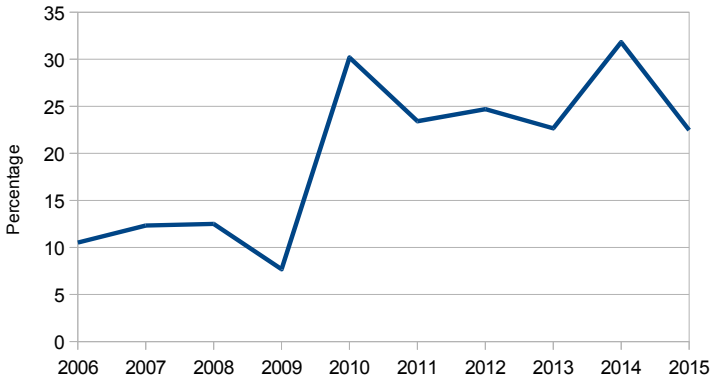

Figure 2 Percentage of procedures successfully conducted as day surgery.

of the patients. The most used mesh type was Ventralex ST (79.8%) with a size of 6.4 x 6.4 cm. In 4 patients a suction drain was left in situ but all were removed before discharge. Postoperative complications are detailed in Figure 4. Despite three of them occurring in obese patients, there was no statistically significant difference in the complication rate between obese and non- obese patients (p = 0.09). The rate of recurrence was 8.13% (20 patients), with a mean follow-up of 3 years (SD: 1.6).

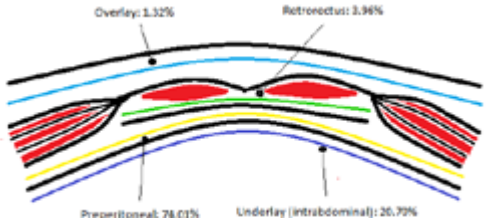

Figure 3 Prosthetic Mesh placement.

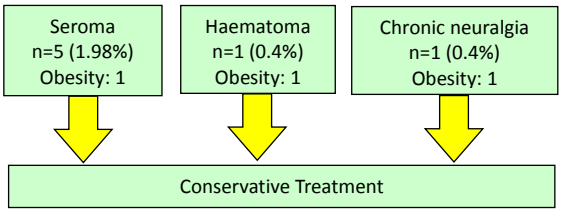

Figure 4 Postoperative Complications.

From the anaesthetic viewpoint, 177 (70%) received regional anaesthesia while in 55 (22%) general anesthesia was performed. The remaining 20 (8%) cases received only local anaesthesia and sedation.

Discussion

The growth of ambulatory surgery in Spain has been evident in recent years [6]. With regard to ambulatory incisional hernia repair, the selection criteria for outpatient surgery remains to be defined. Most published studies are retrospective reviews, performed in a single centre, and with a suboptimal sample size, suggesting a decrease

in morbidity in ambulatory patients compared to those who were hospitalized [7, 8]. Fischer et al., in a study involving 1,706 patients, noted major complications in only in 3.9% of procedures [9].

In our own institute a conversion to ambulatory surgery has provided a considerable financial saving [5]. Our recurrence rate for our ambulatory procedures using prosthetic mesh is between 0 and 10%, which is less than or equivalent to our results for inpatient surgery [3,10]. However even better results were published by Donati et al., with no recurrences at all in a series of 29 patients operated in an outpatient setting [11]. Also noteworthy is the low recurrence rate of 2.4%, found by Acevedo et al. in 2006 with a sample size of 90 patients [12].

The criteria for incisional hernia repair on an ambulatory basis remain ill-defined. Donati et al suggest that the maximum diameter of the hernia sac should be less than 10 cm, and that the wall defect should not be greater than 3 cm [11], but these statements were made more than 10 years ago. In our study, we selected a maximum defect diameter of 6cm for an ambulatory procedure due to the availability of Ventralex (Davol Bard) 8cm self-expanding mesh allowing a preperitoneal overlap of 2cm. The use of this mesh is associated with good published results with a 0% to 9% recurrence rate and a 2.2% to 3% surgical wound infection incidence [13,14]. Its composition allows visceral contact, so it can be placed intraabdominally [15].

Regarding the surgical technique performed, there is some heterogeneity in our results. The common feature in the study is the use of a prosthetic mesh in the repairs, whose superiority to primary closure with suture has been demonstrated in previous studies [16]. The position of the mesh in our study varies considerably, with preperitoneal placement being our most common technique used, a fact that is explained by the midline and periumbilical situation of the majority of the wall defects, which makes the dissection of this plane easier. Since there is currently no evidence to support the superiority of a particular technique over others [1, 17], we did not consider it necessary to carry out any subgroup analysis on this subject.

The recurrence rate obtained in our study is in accord with other studies, although follow-up periods vary. Since the introduction of prosthetic mesh techniques, the accepted recurrence rate is between 5 and 10%, which is significantly lower than that of primary closure, which is between 20 and 50% according to the published series [18]. However, the 8.13% recurrence rate observed in our series is lower than the 20.7% per year referred by the Spanish National Registry of Incisional Hernia of 2016 [19], although the inclusion of recurrent hernias in this registry should be taken into account, might explain this difference. The follow-up time performed in this study could be considered relatively short, since although most recurrences occur within the first 2 years, several studies have shown an increase in the recurrence rate with a longer follow-up period. The study by Burger et al. [20], in which hernia recurrence was observed in 32% of the patients who were reviewed for 10 years, constitutes a good a example of this issue. Finally, our reintervention rate of patients with hernia recurrence is higher than the 20-25% mentioned in the most recent reviews [21].

Only 2.8% of our patients suffered a postoperative complication. This percentage is similar to that reported by Qin et al. [4], in which a 2.1% rate was obtained with 7,666 patients. The seroma rate is much lower than that observed in other studies, in which a 30% rate of appearance is reported [22]. It is possible that the systematic use of a compressive girdle (standardised practice in our centre) from the time of operation may contribute to these good results. The frequency of prolonged postoperative pain (1 single case) was also less than the 5% reported in the existing literature [23].

Conclusion

In conclusion, the results obtained in this study indicates that the incisional hernia repair can be carried out in an ambulatory setting. Patient selection selection is important to ensure good results.

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A Paediatric Day Surgery Unit: Costs and Outcomes

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Abstract

Aim: To access the effectiveness, safety and benefits to the child and the family of a paediatric day surgery programme in the "Agia Sofia" Children's Hospital, the biggest paediatric hospital in Greece.
Methods: Data from the paediatric day surgery unit during 2016 were recorded and included the number and type of surgical procedures, the unplanned overnight admission rate and the financial income and costs.
Results: The number of children treated during 2016 in the "Agia Sofia" Children's Hospital day surgery unit was 1785. The majority of children were between 2 and 7 years of age. Otorhinolaryngologic procedures were the commonest, followed by general surgical procedures. The most common procedures were adenoidectomy, tonsillectomy, gastroscopy, circumcision and myringotomy. The frequency of unplanned admissions following day surgery was very high but was the result of inappropriate use of the day surgery unit. A financial evaluation demonstrated the cost-effectiveness of Childrens' Day Surgery.
Conclusion: Paediatric day surgery is a cost-effective programme benefitting the child, the family and the hospital itself.

Keywords: Ambulatory surgery, economic outcomes, income, cost, children.

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Introduction

Dedicated paediatric day-surgery units have expanded worldwide during the last decade. Children are excellent candidates for ambulatory surgery because they are usually healthy and the surgical procedures are simple, predictable and of short duration [1]. The proportion of elective paediatric cases which can be treated in a day-surgery unit accounts for up to 80% of all paediatric surgery. The well-recognised advantages for paediatric day surgery are: a) less time away from home, since the young patients can rest on their own bed during the night of the surgical procedure, b) reduced hospital costs, c) fewer staff required, d) reduced hospital infections [2].

Day surgery (and moreover paediatric day-surgery) is a recently introduced concept in Greece. Under the current conditions of austerity and fiscal pressures, funding of the National Health System is constantly decreasing. The criteria for the introduction of new health care programmes includes cost-effectiveness. If day-surgery units can reduce hospital costs, thereby reducing the budget for health services, they will increase in number in Greek hospitals. On the other hand, the target of every health programme should also include patient satisfaction and both factors should be kept in mind when planning the health service of the future.

The Paediatric Day-Surgery Unit at the "Agia Sofia" Children's Hospital is a self-contained unit within the main hospital with a floor space of 560m^2, and operating totally independently from the rest of the hospital.

Through this study we tried to access the efficacy, effectiveness and safety of a paediatric day surgery programme and its benefit to the child and the family, and in addition, evaluate the economic benefits to the hospital.

Methods

The day-surgery programme at the "Agia Sofia" Children's Hospital, Athens, Greece, was assessed throughout the calendar year 2016. During this year, the medical records were handwritten and collection of data (number and type of different surgical procedures) was time-consuming. Relevant financial income was calculated using DRGs, combining data on quantities of different surgical procedures and their prices. To calculate costs, the paediatric day-surgery unit was considered as a cost centre, using as cost-driver the percentage of floor space of the hospital occupied by the day surgery unit [3]. Frequency of unplanned admissions following day surgery was also noted.

Results

The number of children treated during 2016 in the "Agia Sofia" Children's Hospital ambulatory day-surgery program was 1785 (Fig. 1).

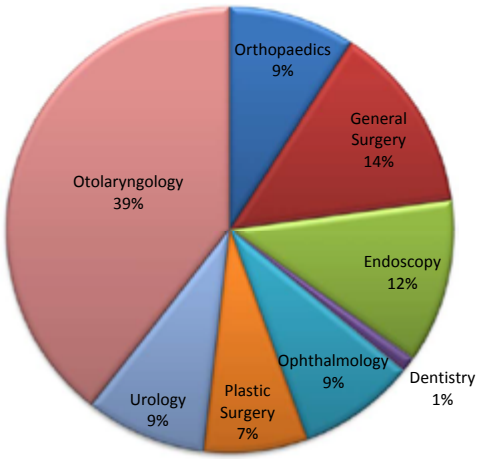

Figure 1 Children Treated in the Ambulatory Day Surgery Programme at the "Agia Sofia" Children's Hospital, by Service, during 2016.

Otolaryngologic surgery accounts for almost 40% of activity in the day-surgery programme, with tonsillectomy and adenoidectomy the most commonly performed operation in this group. General surgery procedures comprise almost 14% of activity with hernia repair the most prevalent. Endoscopy contributes nearly 12% of activity while

circumcision is the most common of the 9% of urological procedures. The number of individual procedures is shown in Table 1.

Table 1 Individual Procedures.

Procedure	No of Patients
Adenoidectomy	498
Tonsillectomy	417
Gastroscopy	180
Circumcision	151
Myringotomy	142
Tubes	115
Colonoscopy	92
Hernia repair	85
Excision of skin lesion	70
Nasolacrimal duct procedures	42

The ages of children treated in the day surgery program are shown in Figure 2. The majority of children (58%) were between 1 and 7 years old. The financial income of the Ambulatory Day Surgery Programme, by Service, is shown in Table 2. The costs of Day Surgery Unit, both direct and indirect, are shown at Table 3.

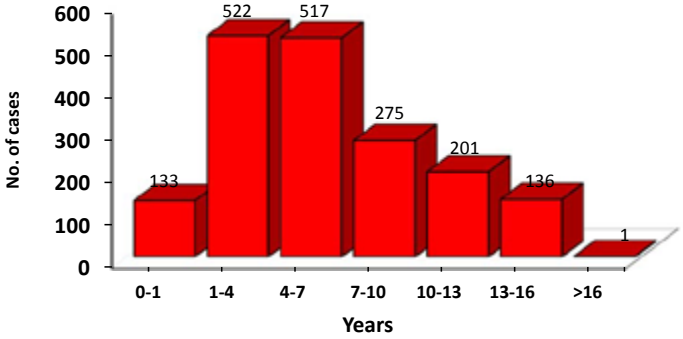

Figure 2 Age range of children treated in "Agia Sofia" Children's Hospital Day-Surgery Unit during 2016.

Table 2 The financial income of the Ambulatory Day Surgery Program at "Agia Sofia" Children's Hospital, by Service, during 2016.

Service	Income (€)	Percent
Otolaryngology	163219	43.52
Urology	28857	7.69
Plastic Surgery	21499	5.73
Ophthalmology	20849	5.56
Dentistry	1640	0.44
Endoscopy	36266	9.67
General Surgery	73294	19.54
Orthopaedics	29392	7.84
Total	**375016**	**100**

Table 3 The costs of the Ambulatory Day Surgery Programme at "Agia Sofia" Children's Hospital, during 2016.

Direct cost (€)	Indirect cost (€)	Total (€)
137,456.93	36,301.83	173,758.76

Unplanned admissions to Hospital from the Day Surgery Unit are listed in Table 4.

Table 4 Unplanned admissions to the Hospital from the Day-Surgery Unit at "Agia Sofia" Children's Hospital, Athens, during 2016.

Service	Unplanned admissions	No. of cases	Percentage
Otolaryngology	109	703	15.50%
Urology	74	156	47.44%
Plastic Surgery	2	134	1.49%
Ophthalmology	15	152	9.87%
Dentistry	8	19	42.11%
Endoscopy	213	213	100.00%
General Surgery	8	245	3.27%
Orthopaedics	25	163	15.34%
Total	**454**	**1785**	**25.43%**

Discussion

The income of "Agia Sofia" Children's Hospital from the function of the Paediatric Day-Surgery Unit during 2016 was €375,016. The relevant cost was €173758.76. This means that there is net 'profit' of €201257.24. The ratio Income/Cost is 2.16. Wage costs are not included in the Greek DRGs [4]. There is no doubt that Paediatric Day-Surgery Unit provides income for the "Agia Sofia" Children's Hospital. The proportion of children suitable for day-case surgery varies by specialty and case mix but in general accounts for 50-70% of the elective paediatric surgical workload in a specialist centre and up to 80% in a district general hospital [2]. Although the day-surgery programme is cost-effective, the real saving comes from the closure of unused beds. Empty beds attract a service cost that reduces the potential savings [5]. However, bed closure is not part of Greek mentality.

Staffing level of a day-surgery unit is controversial. In the United Kingdom, it ranges from 0.2 to 3.2 whole time equivalent (WTE) staff for each staffed bed, chair or trolley. Personnel include nurses, porters, operating department practitioners and assistants, housekeepers, administrative and clerical staff, while medical staff are excluded [6]. At the paediatric day-surgery unit of "Agia Sofia" Children's Hospital there are twelve nurses for two staffed beds. This is a high staffing level and may be excessive. Reduction of staffing level, but within safe limitations could maximise the 'profit' from the day-surgery unit without affecting performance.

The majority of children treated in the paediatric day-surgery unit were between 1 and 7 years. This is in accordance with other studies [1]. The most frequently used services were Otolaryngology, General Surgery and Endoscopy. These three services are also the most profitable services with the Otolaryngology service responsible for almost 44% of the total income of the paediatric day-surgery unit.

The number of unplanned admissions to hospital following day surgery has been reported to range from 0.1% to 5.3% [7-13]. In our unit, the unplanned overnight admission rate was 25.43% during 2016. This number is quite high. Although there is no data for

the unplanned admissions, there are two reasons for this very high frequency.

Paediatric day-surgery unit is an Autonomous Unit located within "Agia Sofia" Children's Hospital. However, operating time in the main hospital operating rooms is insufficient to deliver the routine workload due to lack of nursing staff. Therefore the day-surgery unit is used as an additional facility for more major non-ambulatory operations. Because of this "inappropriate" use of day-surgery unit, young patients need post-operative hospitalization, hence the frequency of overnight admission in Otolaryngology, Urology, Ophthalmology, Dentistry and Orthopaedics services is high. In contrast, endoscopy services serve children already hospitalized in a paediatric ward for a major problem requiring colonoscopy or gastroscopy. Therefore children requiring endoscopy services are all already pre-admitted to the hospital (100%).

The second reason is that "Agia Sofia" Children's Hospital is a tertiary hospital, which serves the whole country. There are many children who come from islands or cities far away from Athens. If the family has to travel for more than an hour on the way back home, overnight recovery after ambulatory surgery is preferred. All these children are hospitalized for one night. Many countries are promoting Medi Hotels. These are hotels close to the hospitals, where the patient is supposed to have the same facilities and staffing as in an ordinary hotel but there are better facilities for handling unanticipated medical problems [14-16]. Unfortunately, such hotels have not yet been developed in Greece.

By reducing the unplanned and the pre-planned admissions after day-surgery, the cost-effectiveness of such a programme may further improve. Despite these disadvantages, paediatric day-surgery is a cost-effective programme benefitting the child, the family and the hospital itself.

The protocol of this study has been approved by the ethical committee of the "Agia Sofia" Children's Hospital.

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Prospective Audit of Unanticipated Hospital Admission following Paediatric Ambulatory Surgery in Paediatric Institute, Hospital Kuala Lumpur, Malaysia

Sivaraj Chandran

Abstract

Background and Aims: Paediatric ambulatory surgery is becoming popular as it has various benefits. Although unplanned admision following paediatric ambulatory surgery is uncommon, its impact on the child, parents and overall the health care setting is significant. The rate of unplanned admission is an indicator of outcome and quality of care. The aim of this study was to audit the rate of unplanned admission following paediatric ambulatory surgery in our centre.

Methods: This is a 12 months prospective audit of factors affecting unplanned admission folowing paediatric day care surgery for the year 2017. Data were recorded in the data collection sheet

Results: 12 patients out of 500 patients were admitted. Mean age of the patients was 4.2 years, with the youngest being 5 months old. The commonest procedures performed are inguinal herniotomy, orchidopexy, circumcision, and hydrocele repair. The commonest causes of admission were unable to pass urine with 7 patients followed by 2 patients with postoperative fever, 2 patients with numbness over the limbs and 1 patient for unexpected complicated surgery. The unplanned admission rate was 2.4% for the period of study.

Conclusion: The rate of unplanned admission in our centre is low and comparable with other parts of the world. Hopefully, this audit can be used as a benchmark for quality of patient care and to benefit the entire healthcare system.

Keywords: Paediatric Ambulatory Surgery, Unplanned admission.

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Introduction & Literature Review

Ambulatory surgery is becoming popular in paediatric practice. Among its benefits are improvement of patient satisfaction, avoidance of hospital admissions and risk of hospital acquired infections, early recovery, early ambulation and cost effectiveness [1]. Improvement in surgical and anaesthetic techniques, patients demand and its cost effectiveness has led to dramatic increases in the number of surgeries performed as day care basis. Paediatric patients are excellent candidates for ambulatory day care surgery as they are generally healthy and their common surgical procedures are usually short in duration and uncomplicated. Although, unplanned admision following paediatric ambulatory surgery is uncommon, its impact on the child, parents and overall the health care setting is significant [2]. The rate of unplanned admission is an indicator of outcome and quality of care. Effective audit has been found as an important component in ambulatory surgery [3]. Elucidating information regarding unplaned admission serves to highlight trends and areas for improvement in services. Identifying the common causes of unplanned admission, and specific groups of patients at high risk is an important step to improve the quality of ambulatory service [4]. However , it is difficult to predict which patients will experience complications requiring admission. In an adult population , Age >80 years old , ASA class 3 or 4 , duration of surgery more than 3 hours and BMI more than 30 are independent predictors of unanticipated admission in adults [4]. In this study, we prospectively evaluate risk factors for unanticipated admission following ambulatory surgery in children.

Methods

Data was collected prospectively from the ambulatory care surgery staffs notes and the patients case notes were revieved for the details regarding the unplanned admission following day care surgery. Data fields collected were patients demographic data , type of surgery, duration of surgery, reasons for admission (surgical related , anasethetic related), type of anaesthesia given, type of nerve blocks performed, and usage of opioids. These data are recorded in the data collection sheet. A complete breakdown of collected fields is shown in the appendix. The study period was between January 2017 to Disember 2017.

Results

Over the period of 12 months, 500 patients attended for day care surgery. The mean age of the patients was 4.2 years, with the youngest being 5 months old (Table 1).

The commonest procedures performed were inguinal herniotomy, orchidopexy, circumcision, and hydrocele repair (Table 2).

A total of twelve patients were admitted to ward following day care surgery throughout the period of study. Commonest cause of admission were unable to pass urine with 6 patients followed by postoperative fever, numbness over the limbs and unexpected complicated surgery with 2 patients each (Table 3). The unplanned admission rate was 2.4% for the period of study.

Table 1 Distribution of patients by age, race and gender.

	Number	%
Age		
Less than 1 year	30	6.0
1-4 Years	220	44.0
5-7 Years	240	48.0
Greater than 7 years	10	2.0
Race		
Malay	424	84.8
Chinese	36	7.2
Indian	30	6.0
Other	10	2.0
Gender		
Male	230	46.0
Female	270	54.0

Table 2 Surgical procedure done as day care surgery.

Surgical procedure	Number	%
Herniotomy	224	45
Circumcision	60	12
Orchidopexy	160	32
Hydrocele Repair	50	10
Lymph Node Biopsy	6	1
Total	**500**	**100**

Table 3 Reasons for unplanned admission.

Reason	Number
Unable to pass urine	7
Postoperative pyrexia	2
Numbness of limb	2
Unexpected complicated surgery	1
Total	**12**

Discussion

Ambulatory surgery comprises of less than 50% of the total cases that are being operated for the year. Various figures of overall admission rates have been reported by different authors: Blacoe[5] 2.5% , Dornhoffer[6] 2.2%, Ahlgren[7] 1.7%, Davenport[8] 5.3% , Jones and Smith[9] 8%. Our figure of 2.4% is comparable to published data.

Unplanned admission following day care surgery is an indicator of quality of health care. It comprises patient selection, preoperative assessment, nursing care, medical care, facilities, logistical and geographical aspects. This is the first audit that has been done in this centre, thus this can used as a baseline in looking at the trends of admission rates following day care surgery for paediatrics.

The commonest reason for readmission in this centre is inability to pass urine. Among the 7 patients that were unable to pass urine, 3 patients were given caudal analgesia and remaining 4 patients were given ilioinguinal block. There were no long acting opiods administered perioperatively. There was no dense or residual block noted on examination, and surgery was uneventful. They were admitted to ward and encouraged orally. All of them were able to pass urine within 6 hours admission and discharged well. One of the reasons of unable to pass urine is probably due to dehydration and prolonged fasting. We would like to suggest that any child who has prolonged fasting for more than 6 hours or operative time more than 1 hour, to be given fluid boluses or put on a maintainance drip during the perioperative period. This is to ensure adequate intravascular volume with good perfusion and to maintain diuresis.

Both patients experiencing numbness of the limbs were given ilioinguinal block for herniotomy. Possible explanation for this is probably due to local anaesthetic spread to the lateral femoral cutaneous nerve of the thigh following ilioinguinal block. There was no weakness reported and both of the patients recovered well and discharged the following day.

There were 2 children admitted for fever that were noted in the daycare ward postoperatively following herniotomy. Surgery was uncomplicated and both of them were well preoperatively. There were no further spike of temperature noted during admission and both of them were discharged the following day. This is probably due to SIRS (Systemic Inflammatory Response Syndrome) following surgery.

Another patient admitted was due to unexpected complicated surgery. This patient was planned for orchidopexy following undescended testes. Intraoperatively, noted testes was not identified and surgical incision was extended. Subsequently, it was converted to laparoscopic surgery to localise the testes and confirm the diagnosis. It was then confirmed that this child has absent testes over one side. This child was admitted for observation and discharged well the following day.

Conclusion

The rate of unplanned admission in our centre is low and comparable with other parts of the world. Hopefully, this audit can be used as a benchmark for quality of patient care and to benefit the entire healthcare system.

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Reducing cancellations of pediatric ambulatory surgery at an Algerian University Teaching Hospital

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Abstract

Background and Objectives: The cancellation of elective surgery in children leads to costly waste for the institution and causes emotional stress for the child and his family. The objective of this work is to analyze the evolution of the last-minute cancellation rate of outpatient surgery in children, as an indicator of quality, its causes and to evaluate the effectiveness of the improvement program cancellations.

Materials and methods: A prospective, mono-centric descriptive study that took place in the pediatric surgery department of the University Hospital Center (UHC) Abdelkader Hassani of Sidi-Bel-Abbès. The study spanned a period of 2 years (2013-2015) to identify cancellations in pediatric outpatient surgery. We recorded all admissions to the operating room, and cancellations. Reasons for cancellation were categorized into two broad categories: patient-related and facility-related cancellations.

Results: Over a two-year period, 2487 patients were scheduled for elective surgery at the Pediatric Surgery Department of Sidi-Bel-Abbès University Hospital, of which 1162 children were eligible for outpatient surgery 46.7%, 159 interventions were canceled (13.7%). The average age of patients who have been canceled is 5 years. Patient reasons, administrative reasons accounted for respectively 58.5%, 41.5% on all cancellations. The cancellation concerned more than 61.8% urogenital surgery, 22.5% orthopedic surgery.

Conclusion: Through the quality improvement program, significant reductions have been reported, the cancellation rate has dropped from 20.4% to 3.5%. If the rate has become lower compared to other rate in the world, the impact can be significant by improving institutional resources and waiting lists.

Keywords: Elective, surgery, ambulatury, cancellation, hospital.

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Introduction

Anaesthesia for paediatric outpatient surgery has experienced exponential interest in recent years. It is developing, in particular, because of technological progress, an evolution encouraged by public authorities and health professionals. This development would promote better financial efficiency and improve the quality of care for young patients. However, they demand an adaptation of the organization of the service and a particular vigilance to the reception of the young patient. The cancellation of an elective surgery leads to a costly waste for the institution and causes emotional stress for the child and his family. Cancellations and deprogramming are poorly understood by most clinicians.

The aim of this study is to analyze the evolution of the last-minute cancellation rate of outpatient surgery, as an indicator of quality, its causes and to evaluate the effectiveness of the cancellation improvement program.

Materials and methods

Characteristics of the study: A prospective descriptive, monocentric study that took place in the pediatric surgery department of the University Hospital Center (UHC) Abdelkader Hassani of Sidi-Bel-Abbès, a city located in the west of Algeria. The study spanned a period of 2 years (July 2013-June 2015) to identify cancellations in pediatric outpatient surgery.

Study Population

The paediatric surgery department is located at the UHC, it has two operating rooms including outpatient surgery and conventional surgery. The majority of surgical patients come from the wilaya of Sidi-Bel-Abbès, the others come from neighboring wilayas and even those from southern Algeria.

All our patients were evaluated preoperatively by anaesthesia consultation, after evaluation by the surgeon, following which, patients eligible for outpatient surgery were scheduled. The day before the surgery, the parents of the patients are called by a medical secretary of the pediatric surgery department to confirm the arrival of their child and to reiterate the information with respect to the preoperative fast, and if the child is sick or not. On the day of the intervention, the Anesthesiologist verifies the child's state of health and the conformity of the patient's medical file. Patients have been put on a waiting list in case a program is cancelled.

We recorded all admissions to the operating room, and cancellations. Operative cancellations were defined as surgical cases that were recorded in the operative list (calendar) and were not performed on the scheduled date. All cancellations of scheduled elective operations for patients who did not attend admission to hospital or who were not admitted due to unavailability of bed were included. Patients who died before the planned surgery were excluded.

All cancellations were recorded in a predefined form that included information on the patient's age, hospital identification number, cancellation date, type of operation, surgeon and anesthesiologist, the associated medical problems and the alleged reasons for cancellation. For each cancelled operation, the form has been

completed by the responsible anaesthesiologist. Medical records of the cancelled cases were reviewed to identify the associated medical conditions, preoperative anesthetic evaluations and management plans recommended to improve the preoperative status of patients with associated chronic medical conditions. Patients who were not present were contacted by the department's medical secretary to establish the reason for their absence. Reasons for cancellation were categorized by the authors into two broad categories : patient-related and facility-related cancellations.

Data analysis

Frequencies and percentages have been reported to describe the data. Data were analyzed using SPSS, version 20. Chi-square analysis was used for comparisons between the two groups in both years. The P value <0.05 was considered statistically significant.

In order to optimize operating room occupancy rates, the avoidable nature of canceled interventions was analyzed. The cancellation was considered avoidable when it was possible to anticipate this cancellation of at least 24 hours, by different strategies. Conversely, accidental cancellations the same day were considered non-avoidable.

Results

Over the two-year period (July 2013-June 2015), 2487 patients were scheduled for elective surgery at the Pediatric Surgery Department of Sidi-Bel-Abbès University Hospital, of which 1162 children were eligible for outpatient surgery. 46.7%, these results are illustrated in Table 1.

Table 1 Overall sociodemographic data of scheduled patients.

	n	%
Mean Age		
Months	62.0 + 44.1	
Years	5.2+3.7	
Age Range		
6 months to 6 years	115	72.3
Greater than 6 years	44	27.7
Gender		
Male	125	78.6
Female	34	21.4
Parental Sociocultural Level		
High	47	29.5
Average	94	59.0
Low	18	11.5
Overall Surgical Activity	2487	
Ambulatory Surgical Activity	1162	46.7

The average age of patients who have been cancelled is 5 years with a minimum of 6 months and a maximum of 15 years. The age group from 6 months to 6 years represents 72.3% with a male predominance of 78.6%, the sex ratio is 3.6 / 1.

The socio-cultural level of parents of patients is average in 59% of cases, with a high level of 29.5% of cases. These results are shown in Table 1. One hundred and fifty nine interventions were canceled (13.7%).

The cancellation rate decreased from 20.4% in the first year of study to 3.5% of cases during the second year of study. The cancelled surgical procedures are divided between urological surgery, visceral surgery, orthopedic surgery, plastic surgery and proctological surgery, this distribution is illustrated in Figure 1.

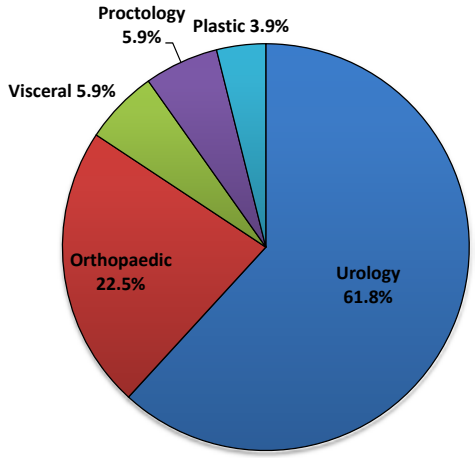

Figure 1 Distribution of Cancellations by Surgical Speciality.

During the second year of study, the doctor cancelled in 68.7% of the cases during the second year of study, with the parents cancelling in 31.3% of the cases The grounds for cancellation were reported (Figure 2): during the first year of study, the call of the day before was not ensured in 21% of cases, with the physician cancelling in 63.6% of cases.

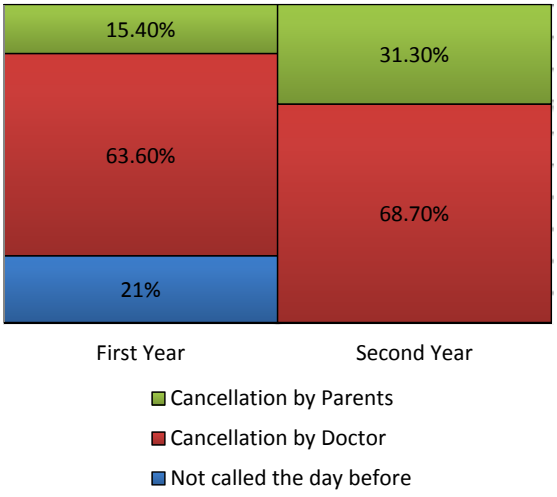

Figure 2 Reasons for cancellation.

The reasons for cancellation were divided into patient-related causes and settlement-related causes are shown in Table 2. Patient-related causes accounted for 58.5% of the overall causes that the arrival of the sick child represented 24.5% of cases, parents were unreachable in 13.2% of cases. Settlement-related cases accounted for 41.5% of cases, the most common, the incomplete file in 11.4% of cases and the occurrence of an unexpected emergency in 12.5% of cases.

We analyzed the factors related to the cancellation of surgical procedures, including age, 82% of cancelled children were aged less than six years and 43% of cancelled patients were classified as ASA 3.

To limit these cancellations, the causes of cancellation were divided into (Figure 3):

- foreseeable cancellations: non-compliance with preoperative fasting, incomplete file, child not present.
- unforeseeable cancellations: sick child, lack of equipment in the operating room.

Table 2 Causes of Patient Deferment.

	n	%
Patient related causes	93	58.5
Child sick	39	24.5
Not fasted	6	3.8
Uncontactable	21	13.2
Already operated upon	6	3.8
Family impediment	7	4.4
No news	14	8.8
Hospital related	66	41.5
- Incomplete file	18	11.4
- No secretary	9	5.7
- Operating Theatre unavailable	13	8.2
- Emergency	20	12.5
- No Indication for Surgery	5	3.1
- Surgeon not available	1	0.6

The inevitable cancellations were the defect of the operating room equipment and the non-availability of the surgeon. Among these types of cancellations, we retain the unpredictable cancellations 50.2% and predictable 49.8%, whose axis of improvement put in place can replace and improve them.

Discussion

The cancellation rate of anesthesia for outpatient surgery is one of the most relevant indicators for evaluating the organization of this type of care. If we have to evaluate the cancellation, we have to evaluate its causes. Causes related to the patient, or the hospital. For hospital-related causes, medical or organizational causes.

During the two years of the study, 159 surgical procedures were not performed on a total of 1162 planned ambulatory procedures, a cancellation rate of 13.7%. This figure represents the overall cancellation rate, however this rate improved, and decreased from 20.4% during the first year of study to 3.5% during the second year of study, with significant change ($p<0.001$). Our overall cancellation rate is comparable to that of the Pohlman study [1], where the authors evaluated the cancellation for outpatient pediatric urological surgery, and found a 13.3% cancellation rate, manageable by improving preoperative parenting education. It is also similar to that of the French study conducted by Cousin et al [2], where the rate of cancellation was cited as 13%. Macarthur [3] conducted a study published in 1995 over a period of three months involving 1042 patients eligible for outpatient anesthesia, and found a 10.2% cancellation; a figure close to the rate found in our study.

However, Boudreau et al [4] found a cancellation rate of 6% from 3,123 patients over a 6-month period in 2008 and another 6-month period in 2010. Similarly, Hanaa et al [5], conducted a study of 16,559 patients in a 250-bed pediatric hospital over a period of 12 months (July 2004 to June 2005) and found that 7.2% of patients were cancelled.

Our overall rate is better than that of Anatol et al [6] in the Caribbean, who conducted a study of 3048 surgical procedures over a three-year period (January 2002 to December 2004) in paediatric surgery departments in Trinidad and Tobago where the cancellation rate was very high, at 30.1%.

Ahmed carried out a prospective study at the Aga Khan University Hospital in Pakistan, covering an adult and paediatric series for a period of two months [7]. Of 1258 patients, 6.7% were cancelled for various reasons. Our rate is also different from those of developing countries ranging from 3.6% in Jordan [8] to 7.2% in Australia [5].

Ebirim [9] conducted a study on an adult and child series at a university hospital in Port Harcourt, Enugu, Nigeria, from 1015

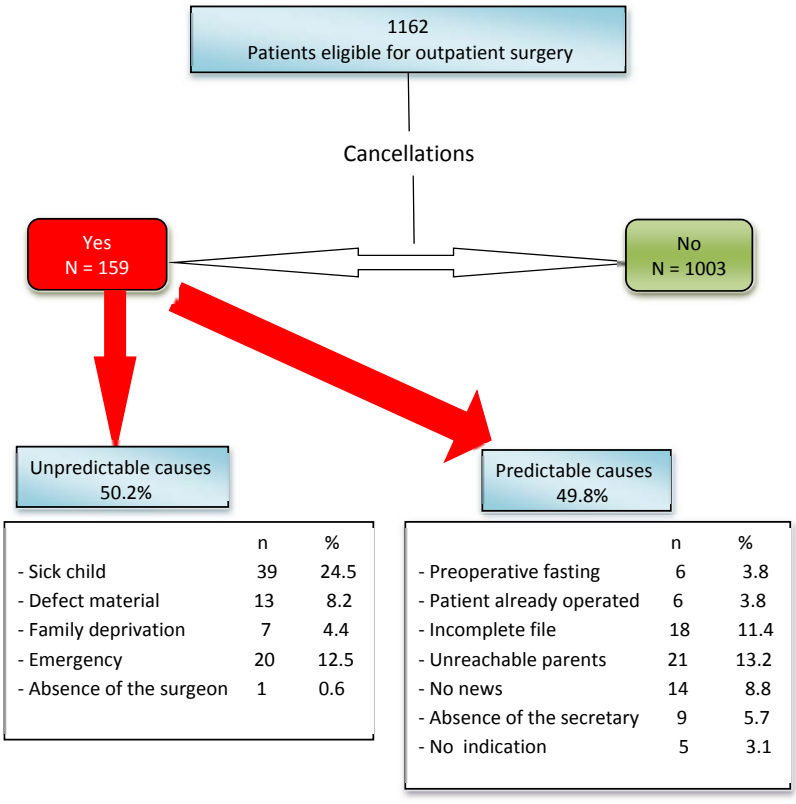

Figure 3 Distribution of Cancellations, Predictable, Unpredictable.

patients from February to June 2011. It determines the cancellation rate and causes of cancellation, and found a rate of 28%.

We consider that the overall cancellation rate in our series is increased in comparison with those of European countries which vary from 1.97% in France to 6.5% in Spain [10,11]. Our cancellation rate has improved significantly (3.5%) in the second year of study, moving closer to that of even developed countries.

The analysis of cancellations of programmed surgical procedures found a prevalence of 61.8% with urological surgery and a minimum of 3.9% for plastic surgery. This variability in the cancellation rate by surgical specialty is related to the predominance of urological surgical procedures compared with those of plastic surgery. This is because of the high frequency of these two types of specialty in our series (Figure 1). Our results are not comparable to those of the Boudreau study [4] where urogenital and orthopedic surgery accounted for only 15%, since the cancellation was more related to ENT surgery.

In our study, we noted an average age of 5 years with a high proportion in children under six years of age who were cancelled. Younger patients are more prone to infections of the upper airways with less tolerance of pre-operative fasting periods. Anatol [6] found similar results, with 46.3% of the cancellations related to ages between 1 and 5 years.

In our study, 20% of patients classified ASA 3 were cancelled, versus 14% of patients classified ASA 1. This is probably due to their state of health on the day of the intervention.

The analysis of the reasons for cancellation of the interventions shows that the most frequently found cause is the cancellation related to the patient. The causes are varied: in particular the disease of the child, ADARPEF published diagnostic criteria to standardize the practices [12, 13]. It is accepted by all intensive care anaesthetists that failure to induce general anesthesia in a child with an upper respiratory tract infection or a cold is an effective means of limiting respiratory complications, namely laryngeal spasm, bronchospasm and other complications. The causes related to the patient and their parents are also represented by: parents unreachable on the phone the day before, patient already operated upon, no news of patients, family impediment, practical incidents related to transport, anxiety, change of mind. In total, 49.8% of the total cancellations bring together various predictable and preventable causes.

The second reason for cancellation is related to the establishment. In the majority of cases patients were challenged by the anesthesiologists, others by the surgeon. 41.5% of the patients postponed were cancelled for causes related to the establishment (Table 2), of organizational order, logistics of which the most important, the unforeseen last-minute admission of a particularly neonatal emergency, the incomplete file of the patient, the non-availability of the operating theatre (breakdown of sterile block, operating light failure or hardware problem).

The analysis of the avoidability of predictable or non-predictable cancellations shows that with 49.8%, there is a potential to implement an improvement strategy. All expert opinions converge on the idea that a significant number of cancellations can be avoided, by setting up a program consisting of protocol draft, reporting in the event of cancellation and studying the economic impact of cancellation and delay. Thanks to the program improvement, the rate fell from 20.4% to 3.5% of cases. Cancelling a child from surgery can be stressful and expensive [14]. Postponement of a child has serious consequences with impact on the family and an anaesthetic and surgical team under utilised. Thanks to the motivation of the entire medico-surgical team of the Pediatric Surgery Department of the CHU of Sidi-Bel-Abbès, an improvement strategy was put in place to reduce the number of last-minute cancellations. For this, several tracks have been possible depending on the predictability and unpredictability of the cancellation.

Predictable causes, whether they are related to the patient or the hospital, can be avoided, as opposed to unpredictable causes. This distribution was used by the Montreal Children's Hospital to improve their high cancellation rate (10%), and they found solutions to improve ambulatory care.

a Predictable Causes:

In ambulatory anesthesia, the operating rooms work with a steady and regular patient flow to function effectively. Last minute late cancellations interrupt the flow and decrease the flow of the operating room, so there is a waste of resources. To influence this type of waste, predictable causes are preventable by setting up a strategy.

- Patient fasting : In our series, we reported 3.7% cancellation for non-compliance with preoperative fasting. Our result is similar to other series, Tait [14], which is 3.5%, de Haana [5] which is 3.5% and that of the Jordanian study of Mesmar [8] which is 2.6%.

  Thanks to the information system put in place on the risks of non-compliance with pre-operative fasting accepted by all of the team, the latter was respected during the second year of study (Table 3). The information on compliance with the preoperative fast was given in an oral and written manner delivered by the surgeon, the anesthesiologists and the medical secretary in the call the day before the operation. During the second year of study, we reported no cases of non-compliance with preoperative fasting.

- Incomplete file: The cancellation rate due to a lack of records, in particular anesthetic or disrupted budget, was 11.4% (Table 2)

Our result is comparable to that of Ebirim et al, which was 10.9% [9] but not to the American study of Boudreau [4] which was 3%.

At the end of the study, we had only one case of cancellation due to lack of files, and this was due to the organization of the programming of the patients. The patient was placed on the list of operating program and is called only if he has a record and has been checked by the anesthetist. If the balance is disrupted, the patient is called to take charge of this anomaly and correct it (Table 3).

- *Unexpected emergency admission:* The most common perception of the hospital that elective surgery is cancelled because urgent surgery prevails or lack of beds. An emergency admission disrupts the operational program, and is unpredictable. At the beginning of the study, an ambulatory patient was cancelled if there was an emergency. On the other hand, the cancellation of a patient is avoidable, afterwards, we have implemented a strategy to respect the operational program even if an emergency is realized in addition. It will do more work for the team, but it does not happen every day

- *Patient absent:* The patient and his parents did not show up on the day of the procedure. In the case where the parents were unreachable, we took two mobile phone numbers from the parents, or from the home or a third party (Table 4). In the absence of a secretary, it is the doctor who calls his patients and confirms their programming and their attendance the next day at the service level. The preoperative telephone call allowed our study to reduce the cancellation rate as is the case with some institutions that have implemented the preoperative telephone call [14]. In the United States, Patel and Hannalah [15], established a preoperative phone call, which reduced the cancellation rate by 50%.

  To solve the problem of absence of the patient the day of

Table 3 Evolution of the cancellation rate according to the causes.

	First year		Second year	
	n	%	n	%
Patient related causes	**83**	**89.2**	**10**	**10.8**
Child sick	33	84.6	6	15.4
Not fasted	6	100	0	0
Uncontactable	21	100	0	0
Already operated upon	6	100	0	0
Family impediment	5	71.4	2	28.6
No news	12	85.7	2	14.3
Hospital related	**61**	**92.4**	**5**	**7.6**
Incomplete file	17	94.4	1	5.6
No secretary	9	100	0	0
Operating Theatre unavailable	13	100	0	0
Emergency	16	80	4	20
No Indication for Surgery	5	100	0	0
Surgeon not available	1	100	0	0

surgery, in the case where the patient is not aware of the date for surgery, Haana [5], finds the use of pre-admission to be useful. Pre-admission is practiced in all hospitals in France to avoid absences of patients by forgetting. The patient makes his pre-admission several days before the day of the procedure just after the anaesthesia consultation. In addition to all the solutions implemented, a waiting list strategy is followed at the level of our service, which has been undertaken by several authors [16]. We carry two or three patients on the waiting list of the operating program. These patients would be informed, aware of the issues, and accept the postponement of their child (Table 4). During the call the day before, parents are told that their child is on the waiting list, and they will only be operated on if there are patients who are canceled or otherwise absent on the day of the procedure. The patient on the waiting list arrives on the morning of the procedure, he does not visit anesthesia and will be examined by the anesthetist resuscitator doctor if there is a cancellation and the procedure can be carried out, otherwise it is explained they will be on the list of the next program.

b Unpredictable causes:

These are the causes either related to the patient or the hospital,

- *Sick child:* This was the most common cause of cancellation usually involving upper respiratory tract infections, especially in winter, or gastroenteritis.

According to Bryson [17], recent upper respiratory infection predisposes to a greater risk of respiratory complications such as laryngospasm, bronchospasm, desaturation and respiratory pauses [18,19]. This rate is not similar to that of Ahmed [7] which is 5.4%, and that of Anatol [6], which is 26.8%. Boudreau 4 [45] observed a 49% cancellation rate per cause of childhood illness.

Macarthur [3] found a 49% rate of respiratory tract infection, this high result is due to the fact that the study was conducted during three winter months during which children are often sick. In Quebec [20], 10% of their patients were cancelled because they were ill on the day of the procedure. In case of inadequate preparation of the patient for the intervention, they asked the parents to call the hospital at the beginning of the acute illness. This strategy is followed in France, parents call the hospital if their child is sick. This experience is followed at the Mott University Children's Hospital in Michigan, which suggests educating parents to call the hospital if the child has a problem [14].

Some authors advocate assessment of the severity of the symptoms between a child with a cold that an experienced anesthetist doctor can safely induce, and a child who presents with an asthma attack.

- *No operating room availability:* this is a problem we found in 12.7% of patients that were cancelled. Generally, it is either steribloc problem, or operating light, autoclave, equipment, which are out of order. In this case the solution is not local. This failure could last up to several days, and patients scheduled for the day of the disruption are cancelled. Our result is not comparable to that of the Anatol study [6] which is 22.9%. On the other hand, it is much higher than that of the Boudreau study where the cancellation per operating room cause is 0.5% [21].
- *Child missing or late:* in 17% of cases the child did not show up, either due to family impediment (4.4%) or traffic or weather problems. This rate is comparable to the Anatol study [6].

The preoperative telephone call the day before the procedure and the waiting list have made it possible to overcome this problem unless the patient is at the end of the program and arrives a little late (Table 4).

In our study, we did not find any causes of cancellations for lack of hospital beds despite the limited number of beds (26 beds), for the simple reason that the discharge of patients in hospital is done every day and in admissions function, which is different from the Australian study, where Hanaa [5] found 2.3% of patients were canceled due to lack of hospital beds.

The economic impact of last minute cancellations is not evaluated in our country because for the moment it is neither the doctor nor the patient who pays the bill of care. On the other hand, the psychological and emotional impact that the cancellation can have on the child and his family is important.

Tait [14], sent questionnaires to parents of cancelled children, 54% of parents are disappointed with this cancellation, 16% frustrated and 3.3% of parents angry. All expert opinions converge on the idea that a significant number of cancellations can be avoided, by setting up a program, which consists of the drafting of protocols, reporting in case of cancellation, and studying the economic impact of cancellation and delay. This model will help the hospital understand the far-reaching effects of these cancellations and help focus the improvement effort in a way to contain costs and reduce waiting lists.

In the United Kingdom, the National Health Service has established a tool for monitoring the cancellation including outpatient surgery in 2002 [5]. The program to improve ambulatory care to reduce the cancellation rate, cancellations, allowed us to have much lower cancellation rates. The rate increased from 20.4% to 3.5% of cases, which is consistent with data from the literature [2].

It is important to emphasize in this work, the operating rooms are not dedicated to the outpatient which is a reflection of the efficiency of the pediatric surgery department of the CHU of Sidi-Bel-Abbès, thanks to the good will and the qualification of the medical and paramedical team of the service.

Conclusion

While it is obvious that there is no simple, quick or quick-fix solution to accelerate access to surgical care, there are still well-established strategies that have proven themselves in the near future. all institutions that have adopted them. The strategies listed above added to institution-specific initiatives, as well as a strong desire to make the necessary changes, are the keys to success (Table 4).

Table 4 Cancellation Improvement Programme.

Causes of cancellation	Before	After	Program implemented
Predictable causes			
Preoperative fasting NS:Tait(3.5%)[14] Haana austr(3%)[5] Mesmar(2,6)[8]	6,5%	0%	Optimization of information on preoperative fasting Deferring the passage to the block in case of non-fasting.
Incomplete file NS:BoudreauUSA(3,5%)[4] Ebirim niger10,9%)[9]	18,7%	9,1%	Verification of files the day before
Unexpected admission of a surgical emergency			The program is respected and the urgency is made more
Patient absent (already operated) S Anatol[6] **Unreachable parents** **No secretary**	4,2% 14,7% 6,3%	0% 0% 0%	waiting list two phone numbers are registered the doctor making the call
No predictable causes			
Sick child	33/39 (84.6%)	6/39 (15.4%)	Parents report the problem during yesterday's call: Quebec (MCH 122) and France Admitting some cold patients with the acquisition of an anesthesiologist's experience

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