

Unanticipated Admission After Day Surgery

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ABSTRACT

Day surgery is becoming more common due to its cost effectiveness as well as patient acceptance. With increasing caseloads, there is a need to maintain quality of care. The purpose of this study is to identify the reasons for unanticipated admissions in our day surgical population, with the aim of improving efficiency of day surgical services, yet maintaining a high standard of patient care. A retrospective review of records of patients who were admitted over the two-year study period was conducted. Unanticipated admission was defined as unplanned admission after a day surgical procedure. Data relating to physical status, perioperative complications and reasons for hospital admission were recorded. A total of 10,801 procedures were done, and 163 patients were admitted. The unanticipated admission rate was 1.5%. Most of the admissions were surgically related (62.8%), followed by anaesthesia (12.2%), social (9.5%) and medical reasons (8.1%). Seventy-five percent of these admissions were potentially preventable. The majority were due to common problems like postoperative pain, admission for surgical observation and for social reasons. Non preventable causes (25%) were mainly due to unrelated medical problems.

Keywords: day surgery, admissions, perioperative, complications

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INTRODUCTION

Day surgery is a modern and cost effective method to treat surgical patients. In many countries, this accounts for greater than 50% of the surgical load. However, apart from reducing health care cost, there is also a need to maintain quality care. Defining this quality is difficult. Unanticipated admission after day surgery can be a good indicator as it concerns the basic goals of same day discharge.

The incidence of unanticipated admission varies from 0.3-9.5%⁽¹⁻³⁾. In many series, the main reasons for

admission were surgical (38-58%), followed by anaesthesia related (25-37%), medical (17%) and social reasons (4.6-19.5%). The purpose of our study was to audit the quality of patient care using unanticipated admissions as a criterion. We aim to improve the overall efficiency of ambulatory services by analysing the reasons for admission, providing solutions to avoid preventable causes of overnight admission.

METHODS

Our day surgery unit consists of a day surgery ward, an admission area, five operating theatres and a six-bedded recovery room. The unit is separate from the main operating theatres but is within the hospital complex. The surgical disciplines using the day surgical centre include general surgery, urology, orthopaedics, gynaecology, ENT and ophthalmology. Our standard patient selection criteria for day cases include those of ASA I to III status between six months to 70 years old, undergoing procedures lasting less than 90 minutes that were not expected to cause excessive fluid shift or physiological impairment postoperatively.

We retrospectively collected data of patients who were admitted after day surgery procedures for a two-year period from September 1996 to August 1998. The list was obtained from the day surgery centre register. The medical records of these patients were then reviewed to determine their physical status, perioperative complications and the main reason for hospital admission. Unanticipated admission was defined as unplanned admission after a day surgery procedure. The admitting doctor can be the surgeon or the anaesthetist.

Prior to their listing all patients were screened using a questionnaire. Patients, who were classified as ASA II and III status were reviewed by an anaesthetist before they were scheduled for operations. Those deemed unfit for day surgery procedures would have their operations done as inpatient and were not included in our study.

The patients were discharged by the surgical staff using Korttila's criteria i.e. stable haemodynamics, minimal pain, nausea, vomiting or bleeding, able to drink, void and walk unaided and must be discharged

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to the care of a responsible adult⁽⁴⁾. Those who are unable to fulfil the criteria were admitted to hospital. As a rule, no general anaesthesia was administered after 1500 hours to allow patients ample time to recover from the effects of anaesthesia prior to close of the day surgery centre.

RESULTS

During the period of study, there were a total of 10,801 procedures done in the day surgery centre. Of these, 163 patients were admitted. Fifteen patient records were unavailable and were thus excluded from further analysis. The majority of patients admitted were in the 20-39 years age group. This was mainly due to the large proportion of this age group presenting for day surgery. The physical status of the patients admitted (ASA I: 109/148, II: 34/148, III: 5/148) was comparable to that of our general day surgical population. The distribution of surgical procedures and admission rates according to specialties is shown in Table I.

The unanticipated admission rate was 1.5%. Among the reasons for admission, 75% were potentially preventable. These were mainly admissions for control of postoperative pain, surgical observation and social reasons. Knee arthroscopies (8/27), breast augmentation (7/27) and laparoscopic gynaecological procedures (5/27) were those that caused significant postoperative pain. Nineteen of the 47 that were admitted for surgical observation were ENT patients for observation for bleed and management of nasal pack. The others in this group, were contributed mainly by gynaecology patients (16/47). There were smaller contributions from general surgery (6/47), followed by plastics (3/47), urology (1/47), and ophthalmology (2/47). Of those admitted for social reasons, 13 were on request from either patient or relatives, and only one was admitted because of lack of suitable escort to take him home. All seven patients who had more extensive surgery than planned were gynaecology patients who after initial laparoscopic assessment, had to undergo laparotomy due to extensive surgical pathology not amenable to laparoscopic resection.

Non-life threatening morbidity like delayed recovery, nausea and vomiting contributed to the majority of preventable anaesthetic related admissions. Of the patients who had slow recovery, one had undergone cataract surgery under sedation in the late afternoon. He had failed to satisfy the discharge criteria and had to be admitted when the centre closed. One other patient had prolonged recovery but no specific reason was found. The remaining four in this group complained of severe giddiness upon reversal from general anaesthesia and therefore had to be admitted. Four patients had perioperative airway problems that

Table I. Unanticipated Day Surgery Admission.

Specialty	No. of Cases (% of total)	No. of admissions (% of patients admitted under each specialty)
Dental	179 (1.6)	1 (0.6)
ENT	771 (7.1)	19 (2.5)
Ophthalmology	1695 (15.7)	36 (2.1)
Gynaecology	2115 (19.6)	37 (1.75)
Paediatric surgery	787 (7.3)	11 (1.4)
Urology	640 (5.9)	6 (0.94)
Plastics	1048 (9.7)	10 (1.0)
General Surgery	1411 (13.1)	12 (0.9)
Orthopaedics	1005 (9.3)	16 (1.6)
Hand surgery	1150 (10.6)	0
Missing data		15
	10801 (Total no. of cases done)	163 (Total no. of admissions)

necessitated admission; two patients aspirated during induction, one desaturated due to laryngospasm and the last had non cardiogenic pulmonary edema.

Only a quarter of total admissions were due to non-preventable causes like drug reaction, difficult airway, surgical bleed or other direct surgical complication and unrelated medical conditions. Two patients were suspected of developing allergy to antibiotic eyedrops after cataract surgery. Out of the nine direct surgical complications, four patients had visceral perforation during laparoscopy, one was suspected of air embolism, one experienced haematuria after urethroscopy. Two patients had complications during cataract surgery; one had anterior chamber rupture, another hyphema postop. There was also a case of bile leak after a liver biopsy. The three patients who had difficult airway were ENT patients who had undergone direct laryngoscopic examination; they had copious secretions post examination and were admitted as a precaution.

Twelve patients were admitted for medical reasons like postoperative angina arrhythmias, hypertension and bronchospasm. Of the five patients who required further investigation or treatment, two were for radiotherapy or hematologist referral, another two were admitted for cardiac workup because of abnormal ECGs and one for intravenous antibiotics therapy.

DISCUSSION

Annually, more than 50% of operative procedures done in our hospital were performed on an ambulatory basis. With increasing efforts to control health care expenditure and improved anaesthetic and surgical techniques, patients with complex medical conditions

Table II. Reason for admission.

Potentially preventable	
(A) Surgical related	54.7%
Pain	27
Surgical observation	47
More extensive surgery than planned	7
(B) Anaesthesia related	8.8%
Delayed recovery	6
Nausea and vomiting	3
Aspiration	2
Perioperative desaturation	2
(C) Miscellaneous	11.5%
Social reasons	14
Late surgery	3
Non-preventable	
(A) Surgical related	8.1%
Bleeding	3
Other direct surgical complication	9
(B) Anaesthesia related	3.4%
Allergic reaction	2
Difficult airway/secretions	3
(C) Miscellaneous	13.5%
Acute retention of urine	3
Unrelated medical problems	12
Further investigation/treatment	5
Total no. of admissions	148

undergoing complicated procedures will be done in day surgery. While it is important to monitor the quality of patient care by monitoring admission rate, it is also essential to audit the reasons for admission so that potentially preventable causes of admissions can be avoided, thus improving the overall efficiency of ambulatory services.

Our unanticipated admission rate was 1.5%. This compares favourably to other studies^(1,2) but may be higher than those done at free-standing ambulatory centres. The hospital based setup of our ambulatory unit allowed surgeons to perform more extensive surgery after initial diagnostic procedures, as the patients could be admitted for further management postoperatively. At freestanding centres, the operation would not proceed and the patient would be rescheduled for further surgery as an inpatient.

From our study, most of the reasons for unanticipated admissions were due to non-life threatening causes, 75% of which were potentially preventable. These were mainly admissions for observation for bleeding, pain management (50% of total admissions) and for social reasons. Most admissions for bleeding were ENT patients. The discipline also had the highest admission rate (2.5%). Common ENT procedures performed in our centre include nasal surgery like septoplasty, endoscopic sinus surgery, tonsillectomies and adenoidectomies.

The possibility of compromising the airway from contamination or obstruction makes it more likely for surgeons to admit these patients. Fortier and Chung also found that ENT patients had the highest admission rates (18.2%)⁽⁶⁾. In a separate study in an ENT day surgery unit, it was found that the majority of admissions were after nasal surgery. The rate was 13.4% for patients undergoing septoplasty, mainly due to bleeding⁽⁷⁾. Observation for bleeding following termination of pregnancy and monitoring for surgical complications after laparoscopic hydrotubation were main reasons why gynaecology patients were admitted for observation. To help reduce admissions, gynaecology patients undergoing these procedures and ENT patients having nasal surgery should be scheduled in the earlier part of the day. They can be observed for bleeding and surgical complications over a longer period, thus avoiding "over cautious" admissions. ENT patients requiring longer and more extensive nasal surgery should be managed as inpatients. Investigators have demonstrated that surgical time longer than 60 minutes is an independent predictor of unanticipated admission⁽⁸⁾.

Adequate pain management remains a challenge in day surgery. Patients must be comfortable before discharge, yet free from side effects of most narcotics. Combination of infiltration with local anaesthetics or regional anaesthesia with an NSAID is usually sufficient for the range of cases done in day surgery. Failures are known particularly in cases like knee arthroscopy, breast augmentation and laparoscopic surgery, as seen in our study. Multimodal pre-emptive approach to pain management, together with use of newer non narcotics (ketorolac, tramadol) and novel use of local anaesthetics (intraperitoneal⁽¹⁰⁾, intraarticular or paravertebral) can contribute to good pain control and reduce the need to admit patients for parenteral analgesics. A change in traditional surgical technique may help reduce postoperative pain e.g. use of CO₂ laser during tonsillectomy⁽¹¹⁾. A commonly neglected area is patient education. Patients often have unrealistic expectations of postop pain relief. They do not know when to take oral analgesics to maximise its effects or use simple physical measures like cold compress to alleviate pain. Up to 50% of patients have reported that instructions in pain control were unclear⁽¹²⁾.

Common perioperative anaesthetic related morbidity like giddiness and PONV can also be reduced. The most common cause for drowsiness and giddiness is poor hydration. Yogendran et al found that outpatients who received 20 versus 2 ml/kg of intravenous hydration had less giddiness, nausea and vomiting postop⁽¹³⁾. Patients who had been fasted for

long periods (>10 hours) having procedures lasting more than two hours should have adequate intravenous fluid replacement.

Elderly patients are more susceptible to prolong recovery with slower return of cognitive function. They should have their procedures done in the earlier part of the day to allow adequate time for recovery from general anaesthesia. For those who require sedation for their procedures, judicious use of appropriate sedatives would reduce recovery time.

The new serotonin antagonist, ondansetron has been effective in treatment of established postoperative emesis⁽¹⁴⁾. Routine use of prophylactic antiemetics in susceptible patients who have previous history of postop vomiting and for those with significant risk factors for PONV (e.g. history of motion sickness, laparoscopic surgery, middle ear surgery), can prevent unnecessary delay in discharge or unanticipated admission. Simple measures like ensuring adequate hydration can contribute to reducing PONV and admission rate.

The incidence of aspiration in the general surgical population ranges from 1 in 2,000 to 1 in 14,000 general anaesthetics^(14,15). In our study, the two patients who aspirated had fulfilled our day surgery fasting guidelines and had no risk factors for aspiration (2 in 10,801). They had reacted to laryngeal mask insertion during induction and had aspirated on regurgitated gastric contents. Such problems could be avoided if adequate depth of anaesthesia was achieved before airway manipulation or surgical stimulus.

Social conditions should be carefully assessed preoperatively. It is important to explain to the family the support needed for successful outcome from day surgery. Proper explanation of the availability of medical support should problems occur would help allay fears and reduce requests for social admission.

Despite careful patient selection and change in day surgical practice, there will always be a small percentage of admissions that are unavoidable. In our study, a quarter of our admissions were unpreventable. These were mainly contributed by unrelated medical conditions (8%) and direct surgical complications (6.1%). Fifty percent of those with medical conditions were elderly outpatients for cataract surgery. While the preoperative questionnaire is a helpful screening tool, careful assessment at the preanaesthetic clinic prior to the operation may be necessary to identify those with uncontrolled medical conditions who are unfit for day surgery.

Airway problems are always a concern for the anaesthetists. Patients with potentially difficult airway, (e.g. carcinoma of larynx for direct laryngoscopic assessment) or those with altered anatomy as a result

of previous treatment, (e.g. limited neck movement or mouth opening post radiotherapy) should be scheduled as inpatients as they are at higher risks of airway problems.

Factors predisposing to complications after ambulatory surgery are operative time >3 hours, general anaesthesia, preexisting cardiovascular disease, hypertension, chronic pulmonary disease and asthma⁽¹⁶⁾. These should be considered during patient selection. Other predictive factors for unanticipated admissions include male gender, surgery finishing after 1500 hours, postop bleeding, excessive pain, nausea, vomiting, drowsiness and dizziness⁽⁶⁾. Some admissions can be avoided by careful scheduling. This should take into account the complexity, duration of surgery and expected recovery period. The later slots of the day should be reserved for shorter procedures and those with least potential for complications

In our study, we noted that a major proportion of unanticipated admissions were due to non-life threatening causes which were potentially preventable. Despite careful patient selection, there will always be a small contribution from unrelated medical causes or direct surgical complications. It is essential to monitor admission rates in order to maintain a high quality of patient care in this era of cost containment.

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