

Ambulatory Surgery and Anaesthesia in HUKM, a Teaching Hospital in Malaysia: The First Two Years Experience

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Summary

Ambulatory or day care surgery is still in its infancy in this part of the world. Our newly built university affiliated hospital started its Day Surgery Centre in February 1998. It is the first multidisciplinary ambulatory surgery centre in a teaching hospital in the country. It caters for Orthopaedic surgery, Urology, Plastic surgery, Otorhinolaryngology, General surgery, Paediatric surgery and Ophthalmology. We have done 2,604 cases and our unanticipated admission rate is less than 2%. There has been no major morbidity or mortality. The problems of setting up a multidisciplinary ambulatory centre in a teaching hospital are discussed.

Key Words: Ambulatory surgery, Ambulatory anaesthesia, Day care surgery, Teaching hospital.

Introduction

Ambulatory surgery or day surgery is a planned operation or investigation that requires facilities for recovery but does not require overnight hospitalization. The concept of ambulatory surgery has achieved worldwide recognition and acceptance. It has been shown to lower costs to both the patient and the hospital, increase efficiency of the hospital while maintaining patient safety and satisfaction¹. Currently, over 70% of all surgical procedures are done in ambulatory settings in the United States (projected to be over 78% by the year 2006)² and between 50-60% in the United Kingdom³.

Ambulatory surgery is still in its infancy in Malaysia, with less than 5% of all surgical procedures in most government hospitals being carried out on a day basis⁴.

This is in spite of a promising pilot study in a peripheral government hospital in 1987 and a directive by the Ministry of Health to implement it in 1988. The problems cited included lack of dedicated facilities, poor selection of cases and a high rate of no-show cases⁴. Nevertheless, with the growing urgency to cut costs and reduce the overcrowding in hospitals, it is inevitable that ambulatory surgery be the solution. There are signs that ambulatory surgery is gaining acceptance in both the private and public sectors in Malaysia with dedicated facilities being built into newer set-ups.

We describe the first two years experience and analyse the performance status in our a dedicated set-up in HUKM, the first multidisciplinary ambulatory surgery centre in a public teaching hospital in Malaysia.

Materials and Methods

With firm support from the hospital's management, a sub-committee involving the dean (chairperson), an anaesthetist (co-ordinator), a surgeon, a representative from each surgical sub-specialty, a nurse manager and a hospital administrator was formed. We agreed on guidelines for the types of surgery, patient selection, screening, counselling, pre-op and post-op protocols. A formal introductory lecture of the system was given to all staff as it involved various disciplines. Initially, monthly meetings were held to review the results and problems. Daily supervision by senior staff was also rostered.

The Day Surgery Centre started its services on 16 February 1998. Being a specialist-based subspecialty centre in a teaching hospital, trainees were allowed to participate under supervision. The services were offered in Orthopaedic surgery, Urology, Plastic surgery, Otorhinolaryngology, General surgery, Paediatric surgery and Ophthalmology. Although there were potentially five dedicated operating rooms (ORs), not including rooms for extracorporeal shock wave lithotripsy (ESWL) and urodynamics, we used only one OR and recently increased to two half-day OR sessions on weekdays.

The Day Surgery Centre and its ORs were next to and with direct access to the main operating theatre (OT). The first stage recovery was managed in the main OT recovery room until adequately trained nurses became available. The second stage recovery was managed in an 11-bedded (excluding recliners) Day Surgery Centre. This Centre handled its own admissions and discharges.

Surgeons assisted in screening patients using a 'medical screening' form. All patients were referred to the centre for counselling by nurses. They were reminded and confirmed via a telephone call the day prior to the surgery. Post-operatively, written post-op instructions and patient questionnaires were given at discharge. Post-op telephone interviews were also done late in the evening after discharge by the nurses.

The parameters studied were the number of cases done by the different surgical disciplines, types of anaesthesia given, duration of surgery, attending surgeons and anaesthetists, unanticipated admissions (patients

admitted as in-patient and not discharged on the day of operation), immediate post-operative complications, cancellation rates and post-operative patient questionnaires.

Results

A total of 2604 ambulatory cases were done during the two-year period; 1763 (67.7%) under general anaesthesia (GA), 620 (23.8%) under local anaesthesia (LA) and 221 (8.5%) non-anaesthesia cases (mainly ESWL and urodynamics). This was 14.4% of the total number of surgical cases done in the hospital (excluding endoscopies that were performed in a separate unit). Of the GA cases done, 60% were males, 87.9% were ASA I (12.1% ASA II), 40.0% were in the age group 1-10 years, and 60.2% were Malays, 27.2% Chinese, 9.7% Indians, 2.9% others.

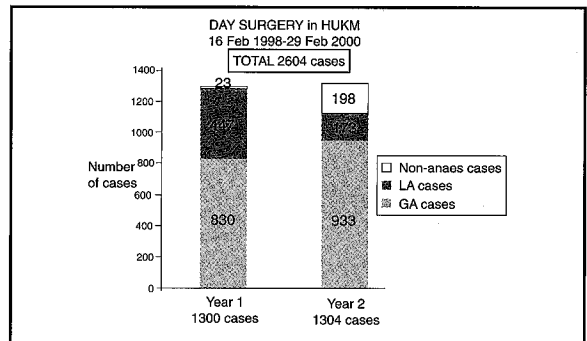


Fig 1 : Number of ambulatory surgery cases.

The two-year period was studied in two phases. Year 1 (16 Feb 1998 - 28 Feb 1999) had 1300 cases and Year 2 (1 Mar 1999 - 29 Feb 2000) had 1304 cases (Fig. 1).

Fig. 2 showed the cases operated by the various disciplines. Urology had the highest number of cases (28.1%) but Paediatric surgery had the most GA cases. Although the yearly cases remained almost similar in number, there was a general increase in GA and decrease in LA cases in the second year period (except for Ophthalmology that had LA list only). This was attributed to the opening of the Trauma OR which handled LA cases not requiring the recovery facilities in the Day Surgery Centre.

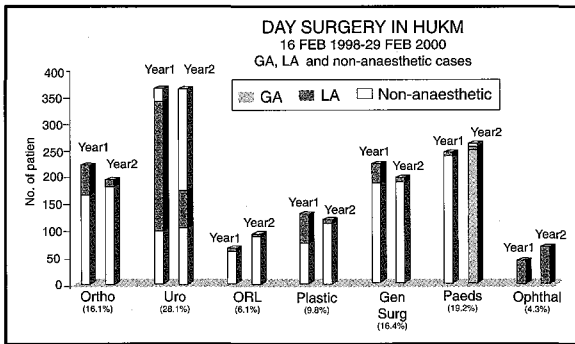


Fig 2 : Type of anaesthesia given for ambulatory surgery in different surgical disciplines.

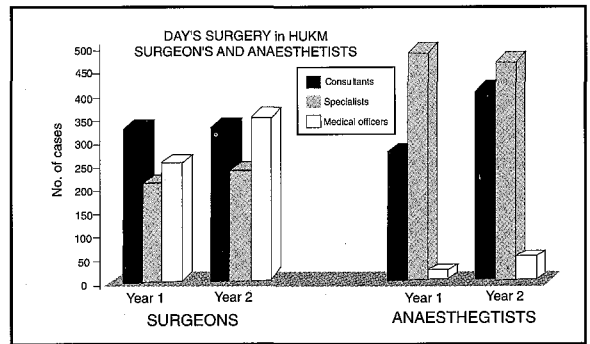


Fig 4 : Surgeons and anaesthetists in ambulatory surgery.

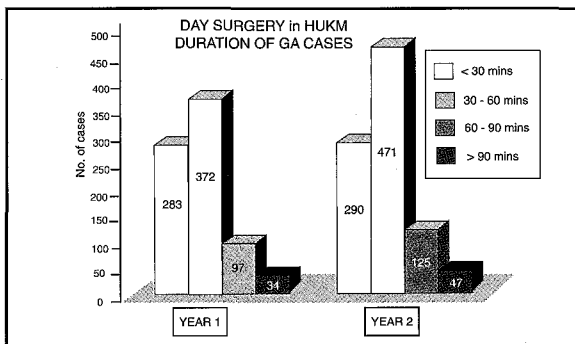


Fig 3 : Duration of ambulatory GA cases.

In the first year, detailed information on duration of surgery (Fig. 3) and the attending surgeons and anaesthetists (Fig. 4) were incomplete, particularly early in the year. This resulted in compilation of 786 GA cases instead of the actual 830 cases.

Fig. 3 showed the duration of GA cases. Most cases were done in 30-60 min (49.0%). Cases longer than 90 minutes made up 4.7% of GA cases, with no decline in the second year.

Fig. 4 showed the attending surgeons and anaesthetists at consultant (Associate Professor or Professor), specialist and medical officer level in the OR for GA cases. 35.4% of surgeries were done by surgical trainees and 3.9% of cases by anaesthetic trainees. The surgical trainees were mostly in their later years of postgraduate

**Table I
Unanticipated admissions in ambulatory surgery**

	YEAR 1	YEAR 2
Total No. of Cases	1300	1304
Unanticipated Admission	29	23 NS
Total = 52 (2.0%)	(2.2%)	(1.8%)
Surgical Concern	13	8
Anaesthesia-Related Concern	2	3
Medical Observation	-	2
Social Reasons	6	-
Ponv/Pain	3	3
Fever	5	2
Lack Of Ot Time	-	2
Pre-Op Medical Stabilization	-	3

* NS (not significant $p>0.05$)

training (Year III - IV) and mainly did orthopaedic and general surgical cases. The anaesthetic trainees were mostly final year registrars.

The total unanticipated ambulatory surgery admission was just under 2% with a slight decrease (1.8%) in the second year (Table I). This was not statistically significant ($p>0.05$).

Orthopaedic surgery recorded the highest unanticipated admission rate of 4.8% (Fig. 5). Otorhinolaryngology and Ophthalmology had no admissions in the second year period.

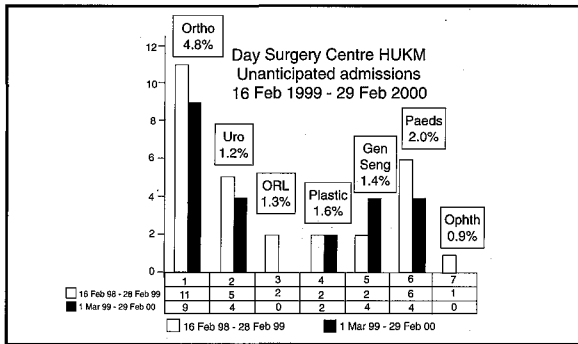


Fig 5 : Unanticipated admissions by different surgical specialty.

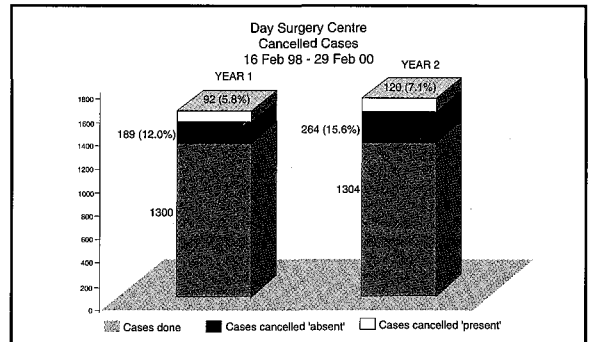


Fig 6 : Cancellations in ambulatory surgery.

Anaesthetic review of the second year (Mar 99 - Feb 00) showed that GA cases (total of 933 cases) were mostly spontaneous inhalational anaesthesia. The induction agent propofol was used in 59.9% and sevoflurane 38.5% of cases. Muscle relaxants were used in 12.9% of cases. The laryngeal mask airway (LMA) was inserted in 81.6% and endotracheal tube (ETT) in 13.2% of cases. Local or regional blocks were supplemented in 69.1% of cases.

The immediate post-op problems of GA cases in the OR and the Day Surgery Centre were shown in Table II. Pain was the most common complaint but only 2.8% had moderate to severe pain requiring IV or IM therapy. This was followed by post-operative nausea and vomiting (PONV), headache or dizziness, sorethroat and bleeding. There was no major morbidity or mortality.

**Table II
Immediate post-op problems in ambulatory surgery patients.**

Post-op Problem	%
Pain	11.2 (2.8% Required IV or IM Therapy)
PONV	8.3
Headache or Dizziness	2.9
Sorethroat	2.0
Bleeding	1.6

Fig. 6 showed the yearly cancellations rates for the two years studied. There was an increase in cancelled cases in the second year.

The reasons for cancellations were compiled from June 98 onwards. From June 98 till Feb 00, the overall cancellation rate was 21.2% (Table III). 6.7% of cases were cancelled at the Day Surgery Centre or the OR. The main reasons identified were patient illness, surgical and medical reasons. The no-show rate was 14.5% with about 20% uncontactable by telephone.

An analysis of 418 'post-op patient questionnaires' revealed that 81.8% of patients would not mind undergoing ambulatory surgery again, 6.7% preferred not to, while 11.5% did not respond to the question. Of those who answered the questions, 93% considered the 'anaesthesia' to be above average (satisfactory to excellent) and 95.2% considered their 'day surgery experience' to be above average (satisfactory to excellent).

Discussion

Ambulatory surgery may be the norm in many established surgical centres world-wide, but in our local environment, a multidisciplinary approach of such a service is still untested, particularly in a formal setting, within a public teaching hospital. It demands familiarization, guidance and continual assessment of all participants, from patients, nurses, parents and guardians, to surgical and anaesthetic doctors, particularly the trainees who do rotational postings.

Table III
Cancellations in ambulatory surgery cases

	JUN 98 - FEB 99	MAR 99 - FEB 00	TOTAL
Cases Done	928	1304	2232
Cases Listed	1146	1688	2834
Cancellations	218 (19.0%)	384 (22.7%) (*NS)	602 (21.2%)
PRESENT	71 (6.2%)	120 (7.1%) (*NS)	191 (6.7%)
-Patient illness	37	38	
-Surgical reasons	18	31	
-Medical reasons	11	35	
-Lack of OT Time	3	8	
-Patient not fasted/late	2	2	
-Equipment problem		6	
ABSENT (NO SHOW)	147 (12.8%)	264 (15.6%) (*NS)	411 (14.5%)
-Uncontactable	28(19.0%)	53(20.1%)	(14.5%)

* NS (not significant $p>0.05$)

It is known that a large volume and high turnover of cases, using methods such as fast-tracking of patients and short-acting drugs, depict the efficiency and profitability in ambulatory surgery¹. The two-year period showed a virtually unchanged number of cases, about 5 cases every week-day. Ours is a controlled set-up where bookings of about 5 cases daily were maintained until the system became established, and adequately trained nurses skilled in day surgery became available.

Although most GA cases were done in 30-60 min, about 4.7% of were done in >90 min. This could be attributed to the inappropriate selection of cases leading to a prolonged surgery or the involvement of surgical trainees (35.4%) despite being supervised. As in many hospitals, there was shortage of senior surgeons, who were involved in both inpatient and outpatient work. 0.4% of cases were postponed due to lack of OR time and 'overbooking' being a contributory factor. To increase patient volume, we need to increase the operating time or number of ORs. Over the two years however, lack of nursing staff has prevented the opening of a second dedicated OR until recently. Urology had the highest number of cases as they used separate ORs for ESWL and

urodynamics. Plastic surgery and Otorhinolaryngology had lower numbers because they operated on alternate weeks in the first year. Ophthalmology had cases only under LA and started operating late in the first year.

The unanticipated admission rate of many established centres has been reported to vary from under 1% to 5%⁵⁻⁹. Ambulatory centres strive to keep this rate low because in-patient admission is said to represent failure of day care service⁵. Our overall admission rate was just under 2% (1.08% surgery-related, 0.23% PONV, 0.23% social reasons, 0.19% anaesthesia-related, 0.19% pre-existing medical problem and 0.08% inadequate OR time) which included avoidable admissions such as social reasons, lack of OT time and pre-op medical stabilization. Many unplanned ambulatory admissions were not due to medical necessity¹⁰.

Cancellation of cases on the day of surgery is disruptive to the OR schedule, costly to the hospital and distressing to patients and staff¹¹. The poor take-off in ambulatory surgery services in a local peripheral general hospital was partly attributed to a high rate of 'no-show' (28%) of patients⁴. Our in-hospital cancellation rate was

6.7%, and no-show rate was 14.5%. Of the no-show cases, 20% were uncontactable via telephone numbers given. We attempted to keep the figures down by emphasizing it at counselling and calling patients before the surgery. The figures increased slightly in the second year period. The local population had yet to respond satisfactorily to our request of informing the centre if they were unwell or unable to keep the surgical appointment. Surgeons also tended to overbook cases when some patients were expected not to turn-up thus resulting in 'lack of OT time' when all the patients came. Earlier telephone calls could have assisted in planning of the OR schedule including adjustments. Other measures that could be considered to encourage patient showing-up or calling-in would be payment of a surgical deposit or compulsory patient re-confirmation via telephone at least, in order for the patient to be listed in. This could screen those really definite on the surgery.

Anaesthetic survey of GA cases revealed that the common immediate post-operative problem was pain, followed by PONV, headache or dizziness, sorethroat and bleeding. We advocated multimodal pain relief techniques and 69.1% of our GA cases received local or regional blocks. Most cases were given spontaneous inhalational anaesthesia using the LMA. We had access to many of the drugs possessing suitable pharmacokinetic profile for ambulatory anaesthesia such as propofol, sevoflurane, alfentanil, fentanyl and intravenous ketorolac. Target controlled infusion (TCI) machines recently became available. Regional blocks were less popular among anaesthetists and patients. One patient insisted on being admitted when he had lingering numbness and weakness following a regional block.

There were a total of 5 directly anaesthesia-related admissions. Two were for regurgitation, one for stridor in a child, one allergy probably due to ketorolac and one post regional block numbness. All required an overnight observation but no serious morbidity occurred. The low anaesthetic complication rate was attributed to stringent screening of patients on the day of surgery and direct involvement of anaesthetic consultants and specialists (96.6%).

An ambulatory setup will be incomplete without consumer feedback. Our post-op patient questionnaire revealed that 93% of patients were highly satisfied with their anaesthesia. Ambulatory anaesthesia requires special considerations as patients will be ambulatory soon after the surgery. Anaesthetic satisfaction is therefore important, and it has been reported that dissatisfaction with anaesthesia was associated with a 12-fold increase in global dissatisfaction of ambulatory surgery¹². There also seemed to be better patient and surgeon acceptance being reflected by the outpatient waiting lists being increased to 4-6 months.

Nurses played a vital role in this ambulatory centre as doctors were only there intermittently before and after the surgery. They were also involved in pre-op counselling, advising post-op instructions, pre- and post-op telephone enquiries and offered first-line contact should patients call for assistance after the operation. As such, all day surgery nurses were given in-house guidance and formal CME lectures by surgeons, anaesthetists and the nursing manager.

Conclusion

This experience of two years indicated that our dedicated multidisciplinary ambulatory surgery centre had been a qualified success. It was safe with acceptably low morbidity, low unanticipated admission rate and a highly favourable patient satisfaction. It was definitely possible to implement wide scale ambulatory surgery with strict protocols in different subspecialties of a public teaching hospital. Proper co-ordination, supervision, nursing co-operation, management support and continuous audit and quality assurance were being implemented. The way forward would be to increase patient volume, efficiency and profitability. The savings in cost to both the provider (HUKM) and the consumer (patient) can be offered as day care service packages without compromising on the standards of care.

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