

Analysis of the efficacy of pediatric day surgery

Mervyn Letts, MD;* Darin Davidson,* William Splinter, MD;† Patricia Conway, RN†

Objectives: To assess the efficacy and safety of a pediatric day surgery program and its benefits to the child and family. **Design:** A review and analysis of prospectively gathered data. **Setting:** The Children's Hospital of Eastern Ontario (CHEO), a university-affiliated pediatric centre with a referral base of 2.5 million people. **Patients:** All children undergoing day surgery at CHEO during the 5 years between 1992 and 1997. **Interventions:** All surgical procedures performed on a day surgery basis. **Main outcome measures:** Procedures performed, complications and unexpected admissions. **Results:** An average of 4899 children per year underwent surgical procedures in the ambulatory day surgery program. The 4 commonest procedures performed were myringotomy, tonsillectomy and adenoidectomy, dental procedures, and inguinal hernia repair. The majority of children were between 2 and 7 years of age. Complications were few, averaging 1.6% per year, with postoperative bleeding, primarily secondary to tonsillectomy and adenoidectomy, being the most common. None resulted in permanent disability and there were no deaths. **Conclusions:** Pediatric day surgery is a safe and cost-effective program that benefits the child, the family and the pediatric surgical program.

Objectifs : Évaluer l'efficacité et la sûreté d'un programme de chirurgie pédiatrique d'un jour et ses avantages pour l'enfant et la famille. **Conception :** Examen et analyse des données recueillies de manière prospective. **Contexte :** Hôpital pour enfants de l'est de l'Ontario (HEEO), centre pédiatrique affilié à une université comprenant une base de référence de 2,5 millions de personnes. **Patients :** Tous les enfants ayant subi une chirurgie d'un jour à l'HEEO pendant la période de cinq ans s'échelonnant de 1992 à 1997. **Interventions :** Toutes les interventions chirurgicales effectuées en une journée. **Principales mesures de résultats :** Interventions effectuées, complications et admissions imprévues. **Résultats :** En moyenne, 4899 enfants par année ont subi une intervention chirurgicale dans le cadre du programme de chirurgie ambulatoire d'un jour. Les quatre interventions les plus courantes ont été : myringotomie, amygdalectomie et adénoïdectomie, procédures dentaires et traitement d'une hernie inguinale. La plupart des enfants avaient entre 2 et 7 ans. Il y a eu peu de complications, en moyenne 1,6 % par année, les saignements postopératoires, surtout à la suite d'une amygdalectomie et d'une adénoïdectomie, étant les plus courants. Aucune intervention n'a donné lieu à une invalidité permanente et il n'y a eu aucun décès. **Conclusions :** La chirurgie pédiatrique d'un jour est un programme sûr et rentable qui bénéficie aux enfants, à leur famille et au programme pédiatrique chirurgical.

The concept of organized day surgery for children was first put forward by Nicoll in 1909.¹ Children are good candidates for day surgery because they are typically healthy, and the surgical procedures they require are generally predictable and often of short duration.

Ambulatory surgery over the past

decade has become extremely popular, not only because costs are decreased but also, from the patient's point of view, because it avoids hospitalization and allows the patient to recuperate in a home environment. The latter is especially true for children. Through the institution of pediatric day surgery programs, it has

been well recognized that the psychologic trauma of separation during hospitalization is minimized by having the child's postoperative care managed in the home environment. In recent years, fiscal pressures have popularized adult ambulatory programs in Canada and the United States.²⁻⁶ The health care programs in

From the *Department of Surgery and †Department of Anaesthesia, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, Ont.

Accepted for publication Dec. 6, 1999.

Correspondence to: Dr. Merv Letts, Department of Surgery, Children's Hospital of Eastern Ontario, 401 Smyth Rd., Ottawa ON K1H 8L1; fax 613 738-4840

© 2001 Canadian Medical Association

both these countries are being forced to become increasingly more cost-effective, being driven in the United States by the managed care environment and in Canada by decreased funding allocated to hospitals by provincial governments. Although this has been one of the main factors in driving the initiation and expansion of adult day surgery programs, in the pediatric field, day surgery programs have been operating in pediatric hospitals for at least 3 decades.¹⁻⁷ The program at the Children's Hospital of Eastern Ontario (CHEO) was incorporated into the planning of the hospital when it was built in 1974 and included a large day surgery unit. It has enlarged from a small percentage of children having their surgery through the day surgery ambulatory program to the current 70% of children having surgery at CHEO through the program.

Although our hospital is not unique in having established a pediatric day surgery program over 20 years ago, we have been a recent leader in instituting a day surgery program for all tonsillectomies and adenoidectomies in children, now having over 6 years' experience with this aspect of the program. It was the purpose of this analysis to document a 5-year experience with our program, to critically analyze the complications experienced and to determine the feasibility of expanding the program to procedures not traditionally done on a day surgery basis.

Methods

To analyze the day surgery program at CHEO, we chose a 5-year period from 1992 to 1997 (since this was just after our tonsillectomy and adenoidectomy program was up and running successfully). All records during this time were computerized, facilitating the collection of data and allowing a more accurate evaluation of the common types of surgery done in each of the surgical disciplines. All complications of the day

surgery program had also been prospectively recorded, beginning in 1990. This was done by documenting the reasons for all unplanned admissions, either from the day surgery unit itself or any unplanned admission of a child who had had ambulatory surgery and was admitted from home within a week of the surgery. We also have recently reviewed our surgical procedures to identify areas into which we could expand our day surgery program.

Results

The mean (and standard deviation) number of children treated annually in the CHEO ambulatory day surgery program during the study period was 4899 (153); hence, the

total number of children seen each year has been remarkably consistent (Table 1). The otolaryngologic procedures of myringotomy and tonsillectomy and adenoidectomy were consistently the most common procedure done through the day surgery program at CHEO (Table 2). These were followed by dental procedures requiring general anesthesia followed by hernia repair, predominantly in infants and young children, ophthalmologic procedures, and circumcisions. The frequency of circumcision has decreased over the past 2 years owing to the Ontario government's withdrawal of financial coverage for nonmedically indicated circumcision.

The ages of children treated in the day surgery program are shown in Fig. 1. The majority of children were

Table 1

Children Treated in the Ambulatory Day Surgery Program at the Children's Hospital of Eastern Ontario, by Service, Between 1992 and 1997

Service	Year				
	1992/93	1993/94	1994/95	1995/96	1996/97
Dentistry	562	536	554	553	597
General surgery	1047	1042	901	826	849
Neurosurgery	3	1	1	1	2
Ophthalmology	541	503	559	464	507
Orthopedics	217	188	154	158	178
Otolaryngology	2064	2247	2265	2196	2015
Plastic surgery	239	179	178	176	178
Urology	211	285	314	308	132
Gynecology	10	9	9	9	4

Table 2

Most Common Surgical Procedures Performed in the Ambulatory Day Surgery Program at the Children's Hospital of Eastern Ontario Between 1992 and 1997

Procedure	Year				
	1992/93	1993/94	1994/95	1995/96	1996/97
Myringotomy, with or without tubes	977	1129	1035	945	854
Tonsillectomy, with or without adenoidectomy	788	825	965	919	807
Dental procedures	545	511	521	533	576
Hernia repair	486	462	472	493	459
Extraocular muscle procedures	325	319	338	276	300
Penile procedures	276	383	221	171	146
Excision of skin lesion	97	75	104	69	96
Nasolacrimal duct procedures	92	73	91	66	85
Cystoscopy	78	75	74	79	70
Cardiac catheterization	12	20	12	56	69

between 2 and 7 years, and this was consistent over the study period. Examining the 10 most common procedures of each of the surgical disciplines in more detail provides an overview of the types of procedures amenable to day surgery. Table 3 illustrates the 10 principal types of surgery performed by the otolaryngology service, illustrating the dominance of myringotomy, tonsillectomy and adenoidectomy. Root canal surgery was the most common dental outpatient procedure followed

by extraction and application of a crown. Extraocular muscle recessions were the commonest ophthalmologic outpatient procedure followed by probing of the nasolacrimal duct and examination of the eye in small children. Inguinal hernia and umbilical hernia repairs are currently the commonest procedures done by the general surgery service. Circumcision was the most common procedure done by the urological service, followed by cystoscopy, hydrocelectomy and urethral meatotomy. The

orthopedic service has had a lower volume of children pass through the day surgery program. Arthroscopy, removal of fixation devices and cast changes in young children have been the commonest procedures done by this service. The most common plastic surgery procedures done through the program include otoplasty and excision of skin lesions. The neurosurgery and cardiovascular services, because of the nature of their surgery, rarely utilize the program. However, cardiac catheterizations are now routinely done through the day surgery service and have been growing in number since the establishment of the pediatric cardiac program at CHEO in 1991. Cardiac catheterization is an example of a new day surgery procedure introduced successfully to the point at which 95% of all cardiac catheterizations are now performed on a day surgery basis.

An analysis of the complications of the program was done in a prospective manner beginning in 1990. Unplanned admissions directly from the day surgery unit are listed in Table 4. The average percentage of patients requiring admission over the 5-year period was 1.6%. The largest number of patients requiring admission was in 1992/93, coinciding with the year that the tonsillectomy and adenoidectomy day surgery program was fully instituted. Most patients requiring admission were children who had undergone tonsillectomy and adenoidectomy. As can be seen from Table 4, this decreased significantly over the ensuing 4 years. The commonest reasons for admission continue to be postoperative bleeding, primarily from tonsillectomy and adenoidectomy, as well as nausea and vomiting. Some children who met the criteria for apnea monitoring were kept in the hospital for overnight monitoring. Table 5 illustrates the admissions of children who were sent home and then admitted within a week. This has averaged 0.3% of our day patients over the

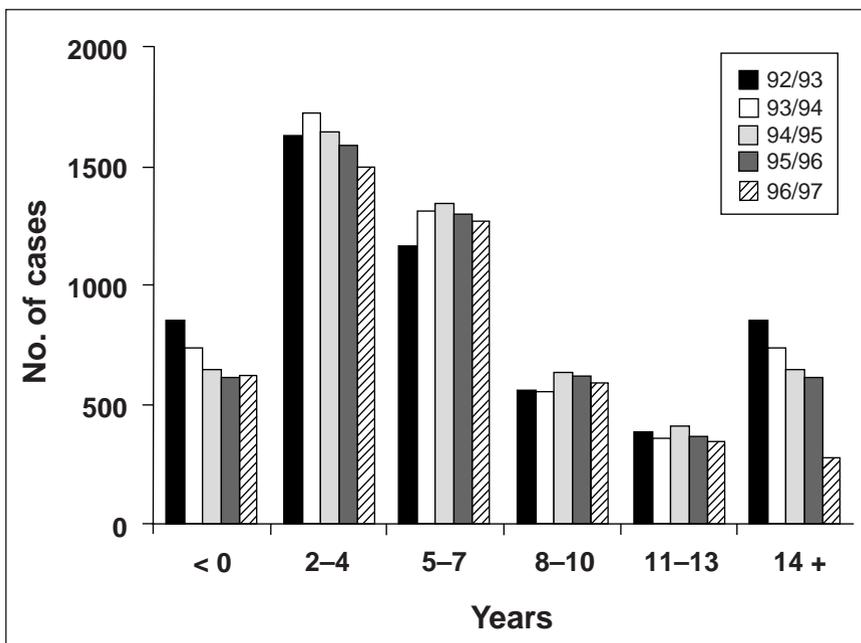


FIG. 1. Age range of children treated in the Children's Hospital of Eastern Ontario surgical day program between 1992 and 1997.

Table 3

Principal Surgical Procedures Performed on the Otolaryngology Service in the Ambulatory Day Surgery Program at the Children's Hospital of Eastern Ontario Between 1992 and 1997

Procedure	Year				
	1992/93	1993/94	1994/95	1995/96	1996/97
Myringotomy with tubes	973	1119	1025	934	851
Tonsillectomy and adenoidectomy	375	403	503	441	363
Tonsillectomy	277	241	299	289	249
Adenoidectomy	136	181	163	189	195
Removal of tympanotomy tubes	30	28	58	57	54
Myringoplasty	31	26	14	17	30
Lingual frenotomy	18	19	29	31	30
Removal of foreign body — esophagus	3	4	2	15	17
Laryngoscopy	19	12	15	21	14
Control of epistaxis	11	8	12	8	12

Table 4**Unplanned Admissions to Hospital from the Ambulatory Day Surgery Program at the Children's Hospital of Eastern Ontario Between 1992 and 1997**

Reason for admission	Year				
	1992/93	1993/94	1994/95	1995/96	1996/97
Bleeding	9	7	16	19	8
Oozing	4	3	4	0	0
Drowsiness	0	1	2	1	0
Nausea and vomiting	23	10	9	7	5
Rehydration	0	0	0	0	0
Pain	7	3	5	1	2
Bradycardia	3	0	0	1	0
Apnea monitoring	8	6	8	7	10
Laryngospasm	6	0	2	0	2
Malignant hyperthermia	7	4	1	2	0
Vomiting blood	5	2	0	1	1
Fever	2	0	0	1	2
Refusal to drink	6	4	1	1	1
Cough, asthma, croup	6	1	1	4	1
Wound infection	1	0	0	0	0
Day surgery unit closed	1	2	3	1	4
Antibiotic administration	2	2	0	0	0
Other	34	23	23	28	34
Total	124	68	75	74	70
Total day surgery cases	4949	5038	4977	4813	4720
Admitted from care surgery, %	2.5	1.3	1.5	1.5	1.5

Table 5**Unplanned Admissions to Hospital from Home of Children Treated in the Ambulatory Day Surgery Program at the Children's Hospital of Eastern Ontario Between 1992 and 1997**

Reason for admission	Year				
	1992/93	1993/94	1994/95	1995/96	1996/97
Bleeding	3	10	15	10	7
Oozing	0	0	0	0	0
Drowsiness	0	0	0	0	0
Nausea and vomiting	1	1	3	1	1
Rehydration	1	1	0	0	3
Pain	0	0	0	0	0
Bradycardia	0	0	0	0	1
Apnea monitoring	0	0	0	0	0
Laryngospasm	0	0	0	0	0
Malignant hyperthermia	0	0	0	0	0
Vomiting blood	0	0	2	1	0
Fever	1	0	0	0	0
Refusal to drink	0	1	0	0	0
Cough, asthma, croup	0	0	0	1	0
Wound infection	0	1	0	0	4
Day surgery unit closed	0	0	0	0	0
Antibiotic administration	0	0	0	0	0
Other	1	1	2	1	2
Total	7	15	22	14	18
Total day surgery cases	4949	5038	4977	4813	4720
Admitted from day surgery, %	0.1	0.3	0.4	0.3	0.4

study period and has varied very little from year to year. Again, postoperative bleeding, primarily delayed bleeding from tonsillectomy and adenoidectomy, was the major reason for admission. During this 5-year period no major untoward experience has resulted in any permanent disability to a child, and there have been no postoperative deaths since the inception of the day surgery program at CHEO among the almost 25 000 children followed up prospectively.

Discussion

There are many advantages of a pediatric ambulatory day surgery program that accrue to both families and hospitals. The child and family are happier and more comfortable with lessened separation anxiety. The child is also not exposed to hospital environmental organisms, with the result that nosocomial infection is reduced. Indeed, postoperative fever accounted for only 3 admissions, cough only 14 patients and wound infection only 6 patients in the entire 5-year experience involving a total of almost 25 000 ambulatory surgical procedures. The program is also extremely cost-effective and avoids expensive admission costs. The real saving, however, comes from the ability to institute actual bed closures; with the development of the tonsillectomy and adenoidectomy day surgery program in 1990, a complete 30-bed ward was able to be closed at CHEO.

Recent advances in anesthesiology have also contributed to the improved results associated with ambulatory surgery. To ensure that children who have other major illnesses are properly assessed before the day of surgery, a preoperative anesthesia clinic to which such patients are referred has been established. Children who fall within a set criteria for referral to this clinic (i.e., associated medical illness, surgery requiring blood transfusions or respiratory or airway malformations) are seen by the anesthesiologist for a preoperative evaluation

within a month before surgery. If necessary, further investigation can be ordered at that time.

Day surgery has become a frequent form of treatment, comprising between 51% and 65% of all surgical procedures.^{2,3,7} Our volume of day surgery has consistently been over 60% of all surgery performed at CHEO over the past 5 years.

Whereas all surgical services offer outpatient surgery, most centres have reported that ophthalmology, general surgery, dentistry and otolaryngology are the most frequent users,^{2,7} and this has been our experience.

To minimize the potential for complications, appropriate patient selection is essential, as not all children are good candidates for day surgery. The child should be American Society of Anesthesiologists physical status I or II, and possibly III if the child's medical condition is well controlled.⁸⁻¹⁰ Elective surgery should be postponed if the child presents with or has a recent history of an upper respiratory tract infection. In order for the child to be suitable for day surgery, the family should remain close to the hospital and the parents should be responsible and capable of following postoperative instructions. We are fortunate at CHEO in having both a Ronald McDonald House and Rotel (a Rotary sponsored hotel) close to the hospital. Children under 1 year of age born prematurely have been reported to be at increased risk of thermoregulatory and respiratory complications, in particular apnea, and must be considered on an individual basis and carefully monitored postoperatively.

The choice of procedures for day surgery must also be considered. Typically, the procedure should be brief and involve minimal bleeding and should not require exposure of any major body cavities.^{8,10} The most common procedures in day surgery include herniorrhaphy, myringotomy, adenoidectomy, circumcision, eye muscle surgery, thyroglossal and first branchial cleft cyst excision,

bronchoscopy and gastrointestinal endoscopy.^{3,8}

Another essential factor in day surgery is the discharge criteria. Commonly the criteria include stable vital signs, the ability to tolerate fluids, ability to void, control of pain, absence of nausea, ability to walk, and a responsible parent or guardian to care for the child.¹¹ The criterion that the child can tolerate fluids attempts to decrease the potential for dehydration. However, mandating that children drink liquids increases the probability of vomiting, a complication already prevalent in children.^{3,12} In response to this dilemma, Schreiner and Nicolson¹³ stated that children should drink only when they feel ready and may even be safely discharged before drinking. This protocol does not increase the probability of vomiting or dehydration after discharge.¹⁴ We also use this approach and have had similar results.

The frequency of unplanned admissions following day surgery has been reported to range from 0.1% to 5.3%.^{3,7,9,11,15-17} Ours has averaged 1.7% over the past 5 years. Some studies have noted that complications of anesthesia, such as vomiting and respiratory difficulty have precipitated most admissions,¹⁸ whereas others have reported the cause to be surgical, such as a more extensive procedure than was initially planned, unexpected findings, or further treatment.^{3,7,11} A combination of surgical and anesthetic complications has also been implicated.^{6,7} In our study, bleeding (mostly from tonsillectomy and adenoidectomy) was the commonest reason for unplanned admission, averaging 11 children per year, followed by nausea and vomiting.

Vomiting is one of the most common postoperative complications in children,^{12-14,19} who have an incidence of vomiting twice as high as that of adults.¹⁸ Postoperative vomiting has been reported to vary between 0.2% (in a study that did not include tonsillectomy and adenoidectomy¹⁷) and 15% (in a study that included tonsil-

lectomy and adenoidectomy²⁰). Of those children suffering this complication, between 33%⁷ and 88%⁹ have required admission. Our experience is of a much lower incidence of vomiting and subsequent admission. Propofol-based anesthetic agents have been associated with a decreased incidence of postoperative vomiting.¹¹

The otolaryngology service has been one of the most frequent users of day surgery^{2,7,9} and was the highest user in our program. The performance of tonsillectomy with or without adenoidectomy on an outpatient basis has been controversial, despite the increasing acceptance of day surgery.²¹⁻²⁶ This has been owing to the higher rate of postoperative nausea, vomiting, bleeding and airway obstruction reported in association with these procedures.^{6,9,18,27-33} Despite this controversy, some American states have legislated that tonsillectomy with or without adenoidectomy must be performed on an ambulatory basis.⁴ The rate of complications associated with these procedures has been reported to range between 2.2%²¹ and 20%.²⁵ In the latter study, 81% of the children with postoperative complications required admission. Our experience has been very gratifying in our tonsillectomy and adenectomy day surgery program, with an admission rate of less than 1.5%.

It must be emphasized that to run a large day surgery program requires dedicated, well-trained nursing staff and the cooperation of the anesthesiologists, surgeons and the surgical office staff. In the CHEO day surgery program, orientation of families and parents begins at the time the surgical procedure is scheduled. At this time a set of guidelines outlining the program is given to the families. It covers essential information such as when the child should begin fasting, what time the family should appear in the day surgery unit, whether a consult to the preanesthetic clinic is required, and the day surgery history

and physical form is completed or arrangements are made for the child to see the pediatrician or general practitioner to have this done. The family is also made aware of accommodations close to the hospital at the Rotel or the Ronald McDonald House. Families are also invited to take advantage of the orientation visit managed by the operating room nursing staff on weekdays, whereby families are taken on a tour, conducted in both official languages, of the day surgery unit and the operating room. The program is reinforced by all staff in the clinics, and families are also contacted a couple of days before the procedure by admitting staff to review the time and day of surgery and the fasting instructions.

An essential component for the success of the pediatric day surgery is the postoperative home care program. This is especially necessary for disabled children.

Conclusions

We have confirmed the safety of a busy pediatric day surgery program. Its acceptance by patients and families is almost universal and its cost-effectiveness is unquestioned. More recognition of the pediatric surgical day care program by provincial funding agencies is necessary to recognize the particular needs of the pediatric population. Pediatric day surgery should not be lumped into funding formulas for adults. There needs to be a greater recognition of pediatric day surgery programs by the ministries of health so that these programs will continue to flourish since they are a major contributor to cost reduction and to quality of child care.

Acknowledgements: We acknowledge the financial support of the Children's Hospital Research Institute for this project.

References

1. Nicoll JH. The surgery of infancy. *BMJ* 1909;18:753-4.

2. Ghosh S, Sallam S. Patient satisfaction and postoperative demands on hospital and community services after day surgery. *Br J Surg* 1994;81:1635-8.
3. Moir CR, Blair GK, Fraser GC, Marshall RH. The emerging pattern of pediatric day-care surgery. *J Pediatr Surg* 1987;22(8):743-5.
4. Raymond CA. Study questions safety, economic benefits of outpatient tonsil/adenoid surgery. *JAMA* 1986;256(3):311-2.
5. Riding K, Laird B, O'Connor G, Goodell AS, Bitts B, Salkeld L. Daycare tonsillectomy and/or adenoidectomy at the British Columbia Children's Hospital. *Laryngology* 1991;20(1):35-42.
6. Rode H, Millar AJ, McCormack, D, Prescott CA, O'Leary P, Cywes S. Ambulatory paediatric surgery. *S Afr Med J* 1994;84:829-33.
7. Postuma R, Ferguson CC, Stanwick RS, Horne JM. Pediatric day-care surgery: a 30 year hospital experience. *J Pediatr Surg* 1987;22(4):304-7.
8. Hannallah RS. Selection of patients for paediatric ambulatory surgery. *Can J Anaesth* 1991;38(7):887-90.
9. Patel RI, Hannallah RS. Anesthetic complications following ambulatory surgery: a 3-yr study. *Anesthesiology* 1988;69(6):1009-12.
10. Yaster M, Sola JE, Pegoli W Jr, Paidas CN. The night after surgery. Postoperative management of the pediatric outpatient — surgical and anesthetic aspects [review]. *Pediatr Clin North Am* 1994;41(1):199-220.
11. Korttila K. Recovery from outpatient anaesthesia. Factors affecting outcome [review]. *Anaesthesia* 1995;50 Suppl:22-8.
12. Strunin L. How long should patients fast before surgery? Time for new guidelines. *Br J Anaesth* 1993;70:1-3.
13. Schreiner MS, Nicolson SC. Pediatric ambulatory anesthesia: NPO — before or after surgery? [review]. *J Clin Anesth* 1995;7(7):589-96.
14. Schreiner MS, Nicolson SC, Martin T, Whitney L. Should children drink before discharge from day surgery? *Anesthesiology* 1992;76(4):528-33.
15. Davenport HT, Shah CP, Robinson GC. Day surgery for children. *CMAJ* 1973;105:498-500.
16. Segal C, Berger G, Basker M, Marshak G. Adenotonsillectomies on a surgical day-clinic basis. *Laryngoscope* 1983;93:1205-8.
17. Steward DJ. Outpatient pediatric anesthesia. *Anesthesiology* 1975;43:268-76.
18. Wood CD. Antimotion sickness and antiemetic drugs. *Drugs* 1979;17:471-9.
19. Rowley MP, Brown TC. Postoperative vomiting in children. *Anaesth Intensive Care* 1982;10:309-13.
20. Kermode J, Walker S, Webb I. Postoperative vomiting in children. *Anaesth Intensive Care* 1995;23:196-9.
21. Guida RA, Mattucci KF. Tonsil and adenoid surgery as an out-patient procedure: Is it safe? *Int Surg* 1990;75:131-3.
22. Guida RA, Mattucci KF. Tonsillectomy and adenoidectomy: An inpatient or outpatient procedure? *Laryngoscope* 1990;100:491-3.
23. Helmus C, Grin M, Wesfall R. Same-day-stay adenotonsillectomy. *Laryngoscope* 1990;100:593-6.
24. Maniglia AJ, Hushner H, Cocci L. Adenotonsillectomy: a safe outpatient procedure. *Arch Otolaryngol Head Neck Surg* 1989;11:92-4.
25. Tan, AK, Rothstein J, Tewfik TL. Ambulatory tonsillectomy and adenoidectomy: complications and associated factors. *J Otolaryngol* 1993;22(6):442-6.
26. Tewary AK. Same-day tonsillectomy. *J Laryngol Otol* 1993;107:706-8.
27. Berkowitz RG, Zalzal GH. Tonsillectomy in children under 3 years of age. *Arch Otolaryngol Head Neck Surg* 1990;116:685-6.
28. Cohen DD, Dillon JK. *Anesthesia for outpatient surgery*. Springfield (IL): Charles C Thomas; 1970.
29. Crysedale WS, Russell D. Complications or tonsillectomy and adenoidectomy in 9409 children observed overnight. *CMAJ* 1986;35:1139-42.
30. Gabalski EC, Mattucci KF, Setzen M, Moleski P. Ambulatory tonsillectomy and adenoidectomy. *Laryngoscope* 1996;106:77-80.
31. Tom LW, Dedio RM, Cohen DE, Wetmore RF, Handler SD, Potsic WP. Is outpatient tonsillectomy appropriate for young children? *Laryngoscope* 1992;102:277-80.
32. Carithers JS, Gebhart DE, Williams JA. Postoperative risks of pediatric tonsilloadenoidectomy. *Laryngoscope* 1987;97:422-9.
33. Colclasure JB, Graham SS. Complications of outpatient tonsillectomy and adenoidectomy: a review of 3,340 cases. *Ear Nose Throat J* 1990;69(3):115-60.