Incidence of Revision Adenoidectomy in Children

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Objective/Hypothesis: Adenoidectomy is a frequently performed procedure in the pediatric population. Revision rates and indications for a second procedure in children are scarce.

Study Design: Retrospective cohort study.

Methods: Patient records at a multistate pediatric healthcare system were searched for all CPT codes that included adenoidectomy in children less than 12 years of age for a 5-year period (2005–2010). A subset of patients was identified for whom the same CPT codes appeared more than once in this 5-year period. The indication, age, gender, adenoid size, and technique of adenoidectomy were recorded.

Results: A total of 23,612 occurrences of the CPT codes were identified. The subset of patients with multiple CPT codes, indicating revision adenoidectomy, included 304 records (1.3%). Mean age at first procedure was 2.8 years (SD = 1.7 years). Mean age at second procedure was 4.7 years (SD = 1.99 years). Mean interval between procedures was 1.8 years (SD = 1.1 years).

Conclusions: Revision adenoidectomy occurs at a rate of 1.3%. Reasons for revision include persistence symptoms ranging from adenoiditis to recurrent otitis to obstructive sleep apnea.

Key Words: Adenoidectomy; microdebrider; coblation; monopolar electrocautery; revision surgery.

Level of Evidence: 2b.

INTRODUCTION

Adenoidectomy and adenotonsillectomy continue to be among the most commonly performed surgical procedures in the United States. Estimates place the number of adenoidectomies and adenotonsillectomies performed in the United States in 2006 at 129,540 and 506,788 respectively.1 Indications for the procedure include adenotonsillar hypertrophy, upper airway resistance syndrome, obstructive sleep apnea, chronic adenoiditis, chronic otitis media with effusion, and chronic rhinosinusitis.2 Multiple methods exist for performing adenoidectomy. These include nonvisualized curettage, curettage with digital palpation, curettage with visualization, suction monopolar electrocautery, microdebrider, endoscope assisted, and Coblation adenoidectomy. Multiple studies have reported a 70–100% improvement of quality of life and symptoms.2–7 Many clinicians observe that there are children who do regress after initial adenoidectomy. Studies have suggested that regrowth of adenoid tissue may occur in 19 to 26% of children.8 Some of these children may require revision adenoidectomy.

This study examined a large population of children to determine the rate of revision adenoidectomy.

MATERIALS AND METHODS

After obtaining appropriate institutional review board approval, the medical records of a multistate, pediatric healthcare system were searched for occurrences of CPT codes associated with adenoidectomy in children <12 years of age (42,820 adenoidectomies <12, 42,830 adenotonsillectomy <12). The records were searched over a 5-year period (January 2005–March 2010). Revision adenoidectomy was defined as two occurrences, at separate dates, of an adenoidectomy code for the same medical record number. This subset of patients was further analyzed. Data were extracted from the available operative notes within the electronic medical record for indications for procedures, surgical technique used for adenoidectomy, and size of adenoids. Size was subjectively graded and reported based upon a numerical scale. An adenoid size of 1+ denotes 0–25% obstruction of the choanae, 2+ denotes 25–50% obstruction, 3+ denotes 50–75% obstruction, and 4+ denotes 75–100% obstruction. There were four separate adenoidectomy techniques used by surgeons in this study.

RESULTS

There were 23,612 records identified for adenoidectomy or adenotonsillectomy in children less than 12. Search for second occurrence of CPT code showed 304 records, giving a revision rate of 1.3%. All adenoidectomies were performed at a tertiary care pediatric hospital. Mean age at first procedure was 2.8 years (SD = 1.7 years). Mean age at second procedure was 4.7
years (SD = 2.0 years). Mean interval between procedures was 1.8 years (SD = 1.1 years).

The operative reports of 99/304 patients were available via the electronic medical record for further, detailed review. Mean size of adenoidal tissue at initial procedure was 3.5 (SD = 0.59). Mean size of adenoidal tissue at revision procedure was 1.76 (SD = 0.95) (Table I). Indications for procedure are listed in Table II. The most common indications were adenoid hypertrophy (77 vs. 63%), persistent otitis media (42 vs. 20%), and obstructive sleep apnea (10 vs. 13%).

Technique for initial adenoidectomy was monopolar electrocautery in 55/99 cases (56%). Microdebrider was used in 22/99 cases (22%), curette was used in 21/99 cases (21%), and Coblation was used in only 1/99 cases (1%).

**DISCUSSION**

We have reported a need for revision adenoidectomy of 1.3% for a large population of children under 12 years of age. The initial procedure was performed at 2.8 years of age and the reoccurrence of symptoms were noted by 4.7 years. The causes of regrowth and the indications for revision surgery appear similar to the indications for the primary procedure.

As a component of Waldeyer’s ring, the adenoid tissue is situated in the nasopharynx and consists of fronds of lymphoid tissue. Size increases in this tissue during the first 12 years of childhood is well reported and may be the result of genetic factors, viruses, bacteria, and other allergens. The symptoms associated with adenoid hypertrophy include upper airway obstruction, obstructive sleep apnea, chronic adenoiditis, chronic rhinosinusitis, and chronic otitis media with effusion. Adenoidectomy is successful for most in relieving these symptoms.

There are, however, some patients who develop recurrent or persistent symptoms and seek revision adenoidectomy. Published data on rates of revision adenoidectomy is lacking. A 2008 study by Monroy et al. of over 13,000 adenoidectomies over an 11 year period showed a 0.55% revision rate. A 2008 study by Joshua et al. on long-term follow-up after adenoidectomy failed to define a specific rate for revision adenoidectomy, but suggested that adenoid regrowth or persistence may be related to the “surgical difficulty encountered by the indirect access to the adenoid pad” and adenoid tissue that “lacks discrete borders.” Other etiologies proposed for recurrence of symptoms after adenoidectomy include persistence of tubal tonsil tissue and reflux.

Various methods have been employed to perform adenoidectomy. These range from nonvisualized curettage to endoscope assisted, adenoidectomy. A recent study surveyed the practice patterns of 120 pediatric otolaryngologists and found that the most common technique was monopolar electrocautery (26%), followed by curette with cautery touch-up (23%), microdebrider with cautery touch-up (20%), and Coblation (7%). The authors also noted an increase in the use of cautery, microdebrider, and Coblation over the past 15 years and a decrease in the use of curette techniques. We observed similar trends; however, the microdebrider technique was used in a higher percentage of our study population.

Multiple reports are critical of the curette technique of adenoidectomy. Nonvisualized curette technique with digital palpation to confirm completeness of adenoid removal reported residual adenoid tissue in 80% of cases. Endoscopic evaluation immediately after curettage has shown residual adenoid tissue in >60% of patients. Other groups have advocated the use of transnasal endoscopy and microdebrider to remove residual adenoid tissue remaining after curette adenoidectomy.

Monopolar electrocautery has gained popularity as a method of adenoidectomy and is noted to be a precise, safe method of adenoidectomy, suitable for all ages. Cautery adenoidectomy reduces operative time and minimizes blood loss compared to curettage. Criticisms of this technique are the introduction of the complications of neck pain and torticollis associated with cautery surgery. Microdebrider adenoidectomy, also reduced operative time and reduced blood loss as compared to traditional curette. The disadvantages noted with microdebrider is the need for additional equipment and increased cost. Additionally, the fixed angle of the microdebrider blade and its fixed length may preclude its effective use in older children and adolescents.

Coblation adenoidectomy has gained popularity as an alternative to electrocautery surgery. This technology uses dissociation of isotonic saline between two electrodes to break molecular bonds between tissues. Coblation allows for tissue dissection at lower temperatures (60 and 70°C) compared to the 400°C of electrosurgery. Advocates tout Coblation’s primary and secondary

| TABLE I. Demographics of Revision Adenoidectomy patients. |
|-----------------|-----------------|
| Mean age at initial adenoidectomy | 2.84 years (SD = 1.69) |
| Mean age at revision adenoidectomy | 4.67 years (SD = 1.99) |
| Mean interval between procedures | 1.8 years (SD = 1.1) |
| Initial adenoid size | 3.5 (SD = 0.59) |
| Adenoid size at revision | 1.83 (SD = 1.12) |

| TABLE II. Indications for Adenoidectomy. |
|-----------------|-----------------|
| Initial (N = 99) | Revision (N = 100) |
| Adenoid hypertrophy—76 | Adenoid hypertrophy—63 |
| Chronic adenoiditis—10 | Chronic adenoiditis—6 |
| Obstructive sleep | Obstructive sleep |
| Apnea—10 | apnea—14 |
| Sinusitis—1 | Sinusitis—0 |
| Associated otitis media—42 | Associated otitis media—21 |
hemorrhage rates comparable to MEC coupled with a lower incidence of postop dehydration. Disadvantages with this technique include need for additional equipment and increased cost.

Whichever method used for the adenoidectomy procedure, revision surgery adds costs. Therefore, all surgeons must strive for complete removal of adenoid tissue from the area of the choanae and the eustachian tube at initial surgery so as to minimize the risk of regrowth of adenoid tissue and recurrence of symptoms. Because the rate of revision adenoidectomy is low, irrespective of technique used, a strengths of this study include the large size of the patient population. The 1.3% revision rate observed in a multistate pediatric healthcare system with 15 otolaryngologists forecasts the number of patients who may require a second operation on his/her adenoids, regardless of indication, preexisting condition, or comorbid conditions. Limitations of this study include its retrospective design.

CONCLUSION

Adenoidectomy remains a needed and commonly performed procedure in children. Regrowth of adenoid tissue with recurrence of symptoms is rare. We found the incidence of revision adenoidectomy in children to be 1.3%. Indications for revision are typically recurrence or persistence of initial presenting symptoms.

BIBLIOGRAPHY