Abstract

Objective: To (1) compare parent-reported outcomes and costs after adenotonsillectomy (T&A) in children between tonsillectomy technique and (2) determine if the technique used influences complication rate. Study Design: Cross-sectional survey with chart review. Results: Primary caregivers of children 1-18 years old who underwent outpatient T&A in a multi-hospital network were contacted via phone 14-21 days post-surgery. Data collected included parent-reported pain score at post-operative days (POD) 2, 3, 7, and 14, and daily normal diet/activity resumed vs hospital readmissions for post-operative complications. Results were compared by technique used. Results: 1,444 children met criteria and 672 surveys (46.5%) were completed. Electrocautery tonsillectomy (EC) was performed in 335 (49.9%) and coblation T&A (CO) in 295 (43.9%). Mean pain scores were significantly worse for CO on POD #7 (mean 1.82 ± 0.92 vs 4.9 ± 2.72, P=0.003). Normal activity resumed in 8.3 ± 3.2 days for EC and 9.2 ± 4.14 days in CO (P=0.002). EC patients used any pain medications fewer than CO patients (8.6 ± 4.2 vs 9.5 ± 4.35 days, P=0.001). No difference was found for duration until normal diet resumed or narcotics use. EC was cheaper than CO across all cost variables (P=0.0001). Complications requiring a hospital visit occurred in 7.8% of EC patients and 11.9% of CO patients (P=0.08). Post-operative hemorrhage occurred in 1.5% with EC and 4.5% with CO (P=0.006). Conclusions: Parent-reported pain scores were significantly different between electrocautery and coblation T&A except at POD #7. Electrocautery T&A had fewer days to resume normal activity and less post-operative hemorrhage.

Results

- 1,444 children meeting criteria were identified; 672 surveys were completed (response rate=46.5%).
- There was no difference in demographics between techniques.
- Significant differences were seen in mean pain reported on POD 7 (P=0.003), mean days to return to normal activity (P=0.002), and mean duration of any pain medication used (P<0.0001) (Figure 1).
- No difference was found in mean days to return to normal diet (8.7 ± 3.49 vs 8.9 ± 3.46, P=0.086) or mean duration of narcotic use (6.5 ± 3.60 vs 6.7 ± 3.62 days).
- Mean OR supply cost, Initial Encounter, and Global Cost differed significantly (Table 2).
- No difference was found in mean Surgery time (16 ± 6.87 ± 15 ± 6.76, min. P=0.212) or mean Total Room time (33 ± 10.19 vs 34 ± 9.58 minutes, P=0.263).
- Rate of return for each device, broken down by reason, is shown in Table 3.

Methods and Materials

Intermountain maintains a large Enterprise Data Warehouse (EDW) that contains administrative, financial (including both costs and charges), and clinical data. Using a previously described method we identified children 1-18 years old undergoing outpatient T&A at one of the Intermountain facilities between June 1 and December 31, 2014. Patients with procedures in addition to T&A at the same encounter and patients with significant co-morbidities or complex chronic conditions requiring an overnight observation were excluded. The primary caregivers of children meeting these criteria were contacted 14-21 days post-T&A.

- **Parent Reported Outcomes**: Parents rated their child’s pain using the Numerical Rating Scale from 0-10 on postoperative days 2, 3, 7, and 14, and reported the duration (days) that pain medication was required, the number of days to resuming normal diet/activity, and any unplanned return visits to a physician or hospital readmissions for postoperative complications (defined as pain, hemorrhage, dehydration, nausea and vomiting, or fever, or any operations for control of post-tonsillectomy hemorrhage) up to 21 days post-operatively. These visits were confirmed using the EDW.

- **Costs**: Using the EDW, it was determined which surgical technique was utilized for each patient’s procedure and the Initial Encounter Costs and OR supply cost. The cost of the postoperative readmission revisits were added to the Initial Encounter Cost to obtain the Global Cost for each encounter.

Introduction

Value in healthcare is defined as health outcomes achieved per dollar spent. With the implementation of the Affordable Care Act, payers are shifting from fee-for-service to value-based reimbursement. As such, the costs of common surgical procedures should be taken into consideration when evaluating outcomes. As technology has progressed, newer techniques have been developed in hopes of expediting recovery while mitigating the risk of postoperative hemorrhage following pediatric adenotonsillectomy (T&A). We recently found in a study of over 19,000 procedures that there was no difference in complications based on the technique, however, it shows that increased costs do not correlate with improved outcomes. In light of such evidence, providers who perform adenotonsillectomy in the pediatric population should examine the value of the routine use of more expensive techniques.

Discussion

- This is the largest known cohort comparing patient reported outcomes and complications by T&A technique in the pediatric population.
- Our cross-sectional cohort spans multiple surgeons and hospitals, making the data applicable to both rural and urban surgeons.
- Costs varied significantly between techniques, with coblator being more expensive.
- Parent reported outcomes (pain at POD 7, return to activity, and duration of pain medication use) were worse for more costly techniques.
- Postoperative hemorrhage was seen significantly more often with the coblation technique.
- Limitations include the observational nature of the study, possible recall bias by caregivers, and the use of the EDW to determine technique could result in mis-assignment of patients if there were a coding error.

Conclusion

With the changing healthcare landscape and the shift to value-based reimbursement, it is imperative that individual providers strive to improve the value of care they provide. This study confirms that hospital costs for pediatric adenotonsillectomy are significantly impacted by instrument costs for the two most common surgical techniques. More importantly, it shows that increased costs were not associated with improved outcomes. In light of such evidence, providers who perform adenotonsillectomy in the pediatric population should examine the value of the routine use of more expensive techniques.

References