The Laryngoscope

The Triological Society Best Practice

When Should We Recommend Intracapsular Tonsillectomy in Pediatric Patients?

Ashley L. Soaper, MD; Carol Li, MD; Jay Paul Willging, MD

BACKGROUND

Tonsillectomy is one of the most frequently performed operations in the United States, with the most common surgical indications including sleep disordered breathing, obstructive sleep apnea, and recurrent tonsillitis. Intracapsular tonsillectomy (also known as intracapsular tonsillotomy, partial tonsillectomy, subtotal tonsillectomy) was first introduced in 1910, but has recently been gaining more popularity. Intracapsular tonsillectomy is performed by removing the tonsillar tissue down to the level of the tonsillar capsule. This is typically performed with either a coblator (Smith and Nephew) or microdebrider (Medtronic), but can also be performed with cold steel, harmonic, laser, or bipolar electrocautery.

Intracapsular tonsillectomy is not yet included in the clinical practice guidelines and not widely performed nationwide. One of the greatest barriers toward adopting this technique is concern for tonsillar regrowth, with many surgeons citing this as their main reason for not adopting this method. Additional obstacles include the learning curve associated with mastering a new tonsillectomy technique as well as concerns for increased intraoperative blood loss with microdebrider intracapsular tonsillectomy. Others are hesitant to offer intracapsular tonsillectomy in chronic or recurrent tonsillitis, with the thought that if the entirety of the tonsil is not removed, these symptoms could recur.

A recent meta-analysis showed that patients who underwent intracapsular tonsillectomy had lower absolute pain scores and a faster return to normal diet and activity level compared to those who underwent extracapsular tonsillectomy[1]. There are numerous short- and long-term studies supporting the benefits of intracapsular tonsillectomy, but there is a paucity of information regarding the efficacy in special populations, such as syndromic patients.

LITERATURE REVIEW

Retrospective reviews and comparative studies between intracapsular and total tonsillectomy have demonstrated multiple short-term benefits of intracapsular tonsillectomy including decreased risk of postoperative bleeding and improved pain control. This is thought to be due to the preservation of the pharyngeal musculature and formation of a biological dressing over the capsule[1]. In a study by Soaper et al., short-term and long-term outcomes were compared between intracapsular and extracapsular tonsillectomy, with a mean follow-up time of 8.2 years. The rate of post-tonsillectomy hemorrhage with intracapsular tonsillectomy was 0.76%[2]. In the Walton et al. review, the bleeding rate after intracapsular tonsillectomy was 0.72% in all studies evaluated[3].

Sleep disordered breathing has been the most studied indication for intracapsular tonsillectomy. This method has been shown to be an effective treatment option and decreases the overall morbidity, with a lower incidence of postoperative hospital admission for dehydration, as well as quicker return to normal diet and activity. In a systematic review of randomized controlled trials, the mean number of days before resolution of pain was 5.0 days in the intracapsular tonsillectomy group and 7.6 days in the extracapsular group ($p = 0.45$ between the groups)[3]. Intracapsular tonsillectomy has been shown to have similar efficacy as extracapsular tonsillectomy when reviewing sleep disordered breathing symptoms including snoring and apneas[4]. Several studies have also shown that intracapsular tonsillectomy is effective in reducing the apnea-hypopnea index (AHI) to normal levels in pediatric patients[3].

Tonsillar regrowth rates have been cited between 0.76% and 16.6% in the literature. In the Soaper et al. study, 0.12% of patients needed revision tonsillectomy to address tonsillar regrowth, with repeat surgery occurring at a mean of 61 months postoperatively[2]. In a systematic review by Sathe et al., two studies demonstrated a

From the Cincinnati Children's Hospital Medical Center (A.L.S., C.L., J.P.W.), Cincinnati, Ohio, USA.

Editor's Note: This Manuscript was accepted for publication on March 19, 2024.

The authors have no funding, financial relationships, or conflicts of interest to disclose.

Send correspondence to Ashley Soaper, 3333 Burnet Avenue, MLC 2018, Cincinnati, Ohio 45229, USA. Email: ashley.soaper@cchmc.org

DOI: 10.1002/lary.31427

tonsillar regrowth rate of 2.4% (three children) and required total tonsillectomy[4]. Sagheer et al. evaluated predictive factors for revision tonsillectomy in 12,145 intracapsular tonsillectomy cases over a 15-year study period. In this large population study, the revision rate was 1.4% (169 patients) with a mean time to revision surgery of 3.5 years and a mean age at revision surgery of 8.4 years. Many surgeons performing intracapsular tonsillectomy will cite a revision rate of around 2.5%[1]. The most common indication for revision surgery was tonsillitis (50%) followed by sleep disordered breathing (38.7%). Risk factors for revision surgery included younger age (5 years vs. 7.5 years), surgical indication of tonsillitis, and history of gastroesophageal reflux disease[5].

In the Soaper et al. cohort, 0.14% of patients undergoing intracapsular tonsillectomy developed peritonsillar abscess, with a mean of 114 months postoperatively[2]. In the Walton et al. review, four studies evaluated the rates of postoperative tonsillitis or pharyngitis after extracapsular versus intracapsular tonsillectomy, and there was no statistically significant difference between these groups with follow-up between 6 months and 3 years[3]. In the Sathe et al. study, children in the intracapsular tonsillectomy group had more throat infections than the extracapsular group, but this was not statistically significant[4].

BEST PRACTICE

Intracapsular tonsillectomy has multiple benefits including decreased postoperative hemorrhage rate and faster resolution of pain. Most of the available data have demonstrated the benefits of intracapsular tonsillectomy in pediatric patients with sleep disordered breathing, but this method is effective for obstructive sleep apnea and recurrent tonsillitis as well. Long-term complications such as tonsillar regrowth are higher than extracapsular tonsillectomy, but still rare. Many studies reflect that the benefits of intracapsular tonsillectomy outweigh this risk. Intracapsular tonsillectomy is a safe and effective method for performing tonsillectomy and should be included in future clinical practice guidelines for tonsillectomy. Further prospective studies reviewing outcomes in syndromic patients will be helpful to confirm its efficacy in these populations.

LEVEL OF EVIDENCE

Sedgwick et al. is a level 1 study, Walton et al. is a level 1 study, Soaper et al. is a level 3 study, Sathe et al. is a level 1 study, and Sagheer et al. is a level 3 study.

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