Pediatric intracapsular tonsillectomy with bipolar electrosurgical scissors

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Abstract
This article describes the benefits of performing intracapsular tonsillectomy with bipolar electrosurgical scissors as an alternative to the powered microdebrider. These scissors are used to excise approximately 90% of the tonsillar mass en bloc. The remaining tonsillar tissue is electrodesiccated by monopolar suction cautery, while the anterior and posterior pillars are completely preserved. The procedure leaves a smaller surgical wound than do extracapsular techniques. Surgical time averages 6 minutes. There is typically no intraoperative blood loss. Bipolar electrosurgical scissors are an efficient and low-cost tool for performing pediatric intracapsular tonsillectomy.

Introduction
Despite a century of technical refinement, pediatric tonsillectomy still causes a significant amount of morbidity.1 Immediate (<24 hr) postoperative bleeding complicates 0.2 to 3% of all cases, and delayed (>24 hr) hemorrhage occurs in 1 to 7%.2,3 Moreover, postoperative pain, dysphagia, and weight loss are nearly universal.2,3

In response to these continuing problems, Koltai et al in 2003 advocated a revival of the abandoned procedure of partial (intracapsular) tonsillectomy, a procedure in which the lateral portion of the tonsil and its capsule are preserved.4 They reported their first cases in 20025 and subsequently described a large series of intracapsular tonsillectomies for the treatment of upper airway obstruction.6 They found that the intracapsular procedure was associated with less morbidity and bleeding than was classic total (extracapsular) tonsillectomy.6

Most authors use a powered microdebrider for intracapsular tonsillectomy followed by electrodesiccation of the tonsillar remnant.6 Although this technique has proved to be workable, resection proceeds slowly, blood loss occurs during dissection, and the microdebrider tips are expensive.

Bipolar electrosurgical scissors were introduced to the United States market in the spring of 1997. Since then, we at the Temple University Children’s Medical Center in Philadelphia have used these scissors for all of our tonsillectomies.7 In more than 1,000 extracapsular tonsillectomies, they have proved to be a safe and efficient instrument for achieving bloodless dissection with minimal damage to surrounding tissues. The length of surgical time has averaged 6 minutes. In this article, the author describes the use of bipolar electrosurgical scissors for intracapsular tonsillectomy.

Surgical technique
Surgeons at the author’s institution use 7-inch bipolar Metzenbaum electrosurgical scissors (PowerStar BP-320; Ethicon Endo-Surgery; Cincinnati) (figure 1). Patients are orotracheally intubated and placed in the Rose position. The mouth is opened with an appropriately sized Crowe-Davis gag, and a headlight is used for illumination. We have found that neither loupe magnification nor an operating microscope is helpful.

The tonsil is grasped near its superior pole with a DeBakey forceps and drawn medially (figure 2, A). By drawing the tonsil in and out, it is possible to estimate its lateral extent beneath the anterior tonsillar pillar and to determine the appropriate depth of the excision. The surgeon then aims the tips of the scissors into the substance of the tonsil with the intent of excising approximately 90% of the tonsillar mass en bloc. The remaining tonsillar tissue is electrodesiccated by monopolar suction cautery, while the anterior and posterior pillars are completely preserved. The procedure leaves a smaller surgical wound than do extracapsular techniques. Surgical time averages 6 minutes. There is typically no intraoperative blood loss. Bipolar electrosurgical scissors are an efficient and low-cost tool for performing pediatric intracapsular tonsillectomy.

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Figure 1. The PowerStar BP-320 bipolar electrosurgical scissors can be obtained from Canada and Europe.
mately 90% of the tonsillar mass (figure 2, C). Care must be
taken to ensure that the scissor tips are in view throughout
the dissection to avoid entering the extracapsular plane
between the tonsillar capsule and the superior constrictor
muscle. Dissection is carried through the tonsillar substance
to the inferior pole, where the tonsil is separated from the
tongue base (figure 2, D).

If islands of tonsillar tissue remain, they are grasped
individually with the DeBakey forceps and excised with
the bipolar scissors. Monopolar suction cautery is used to
electrodesiccate the remaining tonsil (figure 2, E), leaving
behind only a shell of charred tissue (figure 2, F). Neither
the anterior nor the posterior tonsillar pillar is disturbed.
A small, shallow wound results that heals quickly (figure 3).

Figure 2. A: A DeBakey forceps is used to grasp the tonsil near its superior pole and draw it medially. B: With the scissors in
electrified mode, a mucosal incision is made parallel to and just medial to the anterior tonsillar pillar. C: The tips of the scissors
are aimed toward the substance of the tonsil. D: Dissection is carried through the tonsillar substance to the inferior pole, where
the tonsil is separated from the tongue base. E: The remaining tonsillar tissue is electrodesiccated by monopolar suction cautery.
F: Only a shell of charred tissue is left behind.
Ideally, the superior constrictor muscle and the veins of the tonsillar plexus remain covered.

Discussion
In all tonsillectomy procedures, the surgeon’s goal is to remove the tonsil quickly with minimal blood loss. Until the tonsillar fossae are fully mucosalized, patients experience pain and face the risk of postoperative bleeding. Pain during the healing phase is the result of exposure of the superior constrictor muscle and associated nerve endings to mechanical stretch, the ingestion of hypotonic solutions, and abrasion by food. Posttonsillectomy bleeding can be caused by exposure of the thin-walled veins of the tonsillar plexus to these mechanical forces and to the inflammation associated with secondary healing.

Healing time can be shortened by limiting thermal damage to extratonsillar tissue, preserving the tonsillar pillars, and minimizing the size of the oropharyngeal wound. Also, leaving a coating layer of semiviable tonsillar tissue may reduce exposure of the veins in the tonsillar plexus and

Figure 3. At 2 weeks postoperatively, the pharynx has healed completely.
superior constrictor muscle. These principles have guided the development of the intracapsular tonsillectomy technique.

Several authors have described their experiences with intracapsular tonsillectomy.\(^6\) In each series the pain and bleeding associated with the intracapsular procedure were less than that associated with extracapsular techniques. Widespread acceptance of intracapsular tonsillectomy has been delayed by historical cautions against partial tonsillectomy and adenoidectomy. A review of 3,340 cases. Ear Nose Throat J 1990;69:155-60.


The author hopes that the manufacturer will make these scissors easier to purchase in the United States.

References