Laser-Assisted Tonsillectomy

Medical Policy

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Description

Traditionally, tonsillectomy has been performed by means of "cold" dissection. The tonsil and its capsule are separated from the surrounding tissues using metal instruments (i.e., scissors, snare or knife). The upper pole of the tonsil is mobilized then dissection continues to the base of the tongue.

A laser-assisted tonsillectomy may describe any of the following procedures: 1) the use of a laser as a surgical tool in an otherwise standard tonsillectomy procedure; 2) the use of the laser to sequentially vaporize the tonsils in a series of outpatient visits; and 3) the use of the laser to vaporize the surface of the tonsils, i.e., a cryptolysis or a subtotal tonsillectomy.

Either a hand-held carbon dioxide laser (Acupulse® 30 and 40, Lumenis, Inc., Santa Clara, CA), a potassium-titanyl-phosphate laser (KTP/532), diode laser (Quanta System Diode Medical Laser System®, Quanta System SpA, Olona VA, Italy) or an ND:YAG long pulse laser (NaturaLase LP® Laser, Focus Medical, Bethel, CT) may be used.

Policy

A laser-assisted total tonsillectomy performed in either a single sitting or by serial surgery is considered not medically necessary.

A subtotal or partial tonsillectomy (cryptolysis) is investigational.
Policy Guidelines

No applicable information

Rationale

2005 Update

A search of the literature based on the MEDLINE database was performed for the period of 1997 to October 2005. No published studies were identified that would prompt revision of the policy statement; therefore, the policy statement remains unchanged. When used as a surgical tool in an otherwise conventional tonsillectomy procedure, no data are available to suggest that the use of a laser is associated with an improved outcome; data do, however, suggest that the use of a laser is, in fact, associated with increased postoperative pain. (1) No additional data were found regarding the use of a laser to perform a tonsillectomy in a series of ablative procedures, and no data were available regarding the role of a subtotal tonsillectomy. It is likely that research interest has refocused on the use of radiofrequency tissue volume reduction as a technique for performing submucosal ablation of tonsillar tissue. (2)

2006 Update

A search of the MEDLINE database for the period of July 2005 through October 2006 identified no evidence that would prompt reconsideration of the policy statement. A technology review from the Canadian Agency for Drugs and Technologies in Health found no evidence to support an improvement in health outcomes with laser-assisted tonsillectomy or tonsillotomy. (3)

2007-2008 Update

A search of the MEDLINE database for the period of November 2006 through December 2007 identified several studies on laser-assisted tonsillectomy. One study was a randomized within-subject double-blind comparison of tonsillectomy performed with laser, blunt dissection, electrocautery, or radiofrequency coblation. (4) For each of the 60 adult patients, tonsillectomy was performed with coblation on one randomly chosen side; for the other tonsil one of the other 3 “standard” techniques was used (20 patients per comparison group). Pain ratings were higher for laser and electrocautery than for blunt dissection and coblation. Both operative time and blood loss were higher for laser (20 min and 20 ml, respectively) than coblation (10 min and 2.5 ml). Laser and electrocautery resulted in more histopathological thermal tissue injury than coblation. Healing, determined by a blinded evaluator, was slower for electrocautery, but similar for blunt dissection, laser and coblation. No evidence was found to suggest that use of a laser improves health outcomes in comparison with other methods.
Guidance from the United Kingdom's National Institute for Health and Clinical Excellence considers safety and efficacy data to be adequate to support the use of this technique. (5) Efficacy data indicates slower wound healing and increased pain between 24 hours and 2 weeks after surgery compared with cold-steel dissection. It was also noted that although intraoperative blood loss may be less, the risk of post-operative hemorrhage may be greater. There is also a risk of damage to the patient’s face and upper airway.

Partial Tonsillectomy
One study prospectively compared partial tonsillectomy (tonsillotomy) by laser with blunt dissection tonsillectomy in 113 children. (6) The authors noted that a randomized study could not be conducted since (in Germany) tonsillotomy is strictly contraindicated in patients with recurrent throat infections. Therefore, children who had obstructive problems (snoring, sleep apnea, mouth breathing and eating problems; n = 49) and no history of infection were treated with tonsillotomy while those who had recurrent tonsillitis (n = 64) underwent tonsillectomy with blunt dissection. For the tonsillotomy group no post-operative hemorrhage occurred; the mean time to discharge was 3 days (range 1–6). In the tonsillectomy group, 3 (5%) children had post-operative hemorrhage; the time to discharge was 6.9 days (range 5-12). Follow-up contact was achieved for parents of 40 children (82%) in the tonsillotomy group. Two of the 40 (5%) had regrowth of tonsillar tissue and required a subsequent tonsillectomy; none of the children with tonsillotomy were reported to have had recurrent tonsillitis (16 month average; 6 to 24 month range). Follow-up contact was achieved for parents of 57 children (89%) in the tonsillectomy group, who reported only on post-operative analgesic use. Additional studies with longer follow-up are needed to evaluate rates of post-operative hemorrhage, regrowth and recurrent tonsillitis with partial tonsillectomy. Therefore, the policy statements remain unchanged.

2009 Update
A search of the MEDLINE database for December 2008 through January 2009 identified one randomized trial. A prospective, randomized, clinical study (7) (n =80, males =35), conducted in Egypt, sought to compare the advantages and disadvantages of potassium titanyl phosphate (KTP) laser with those of bipolar radiofrequency techniques in pediatric patients aged between 10 and 15 years with tonsillectomy planned for chronic tonsillitis. Patients were prospectively randomized into 2 equal groups: KTP laser tonsillectomy (n =40) and bipolar radiofrequency tonsillectomy (n = 40). The outcome measures included; operative time, intra-operative blood loss, post-operative pain, and rate of post-operative complications. Follow-up visits were scheduled during the first, second and fourth post-operative weeks. Patients were asked to record their pain and discomfort on a standardized visual analogue scale (VAS).

Results:
- Operative time: operative time ranged 6 to 14 minutes in the radiofrequency group and 9 to 15 minutes in the KTP laser group; tendency for shorter operative time in the radiofrequency group, but this did not reach statistical significance.
- Intra-operative blood loss (ml): blood loss ranged from 25 to 35 ml in the radiofrequency group and 21 to 30ml in the KTP laser group; the mean difference of 9ml was statistically significant.
- VAS: First post-operative week pain and discomfort range of scores from 7.5 to 9.5 for the radiofrequency group and 6 to 9 in the KTP laser group; there was no statistically significant difference between the 2 groups; second post-operative week pain and discomfort range of scores had increased for the KTP laser group (range 7.5 to 9.5) compared with a decrease in the radiofrequency group(range 5 to 7); this difference was
not statistically significant; in the fourth post-operative week, both groups showed an equal improvement in pain score with a reduction in pain to normal levels.

- Post-operative complications: The authors noted there was no statistically significant difference between the 2 groups regarding post-operative complications. However, the article did not provide complication rate data for the treatment groups or the overall rate of complications.

The authors concluded both KTP and the bipolar radiofrequency techniques were safe and easy to use for tonsillectomy. Conclusions need to be tempered by the small size of the study groups, lack of inclusion of cold steel dissection technique (considered the gold standard technique), and need for long-term follow-up. In conclusion, future clinical trials comparing surgical techniques will need to ensure that the procedures are standardized, and outcome measures validated for both symptoms and surgical complications.

Summary
No evidence was identified that would alter the conclusions reached above. The policy statements remain unchanged; the total laser-assisted tonsillectomy procedure is considered not medically necessary and subtotal or partial tonsillectomy (cryptolysis) is investigational given the insufficient evidence available to evaluate the net health outcomes in comparison with alternative surgical procedures.

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