

Tonsillectomy using ultrasonic scalpel

Interventional procedures guidance

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www.nice.org.uk/guidance/ipg178

1 Guidance

- 1.1 Current evidence on the safety and efficacy of tonsillectomy using ultrasonic scalpel appears adequate to support the use of this technique provided that normal arrangements are in place for consent, audit and clinical governance.
- 1.2 The use of ultrasonic scalpel for tonsillectomy may result in higher rates of secondary haemorrhage than some other techniques, and clinicians wishing to use ultrasound scalpel should be specifically trained. The British Association of Otorhinolaryngologists – Head and Neck Surgeons has agreed to produce standards for training.
- 1.3 Surgeons should ensure that patients or their parents/carers understand the risk of haemorrhage after tonsillectomy using ultrasonic scalpel. In addition, use of [NICE's information for the public](#) is recommended.
- 1.4 Surgeons should audit and review rates of haemorrhage following

tonsillectomy in their own practices and in the context of the techniques they use. Publication of further information about the influence of different techniques and other factors (such as age) on the incidence of haemorrhage after tonsillectomy would be useful in guiding future practice.

2 The procedure

2.1 Indications

- 2.1.1 Indications for tonsillectomy include recurrent acute or chronic tonsillitis, peritonsillar abscess and pharyngeal obstruction/obstructive sleep apnoea. Life-threatening complications of these conditions are rare and the main aim of surgery is to relieve symptoms.
- 2.1.2 Tonsillectomy has been typically undertaken by 'cold steel' using traditional surgical instruments. It consists of two stages: removal of the tonsil followed by haemostasis. Bleeding is controlled by pressure, then by ligatures. The use of ligatures may be supplemented by diathermy and the use of packs.
- 2.1.3 Techniques using thermal energy can be used in tonsillectomy for dissection and haemostasis. Diathermy uses radiofrequency energy applied directly to the tissue, and it can be bipolar or monopolar. The heat generated is used in dissection to incise the mucosa and remove the tonsil, and for haemostasis, by coagulating the bleeding vessels. Other methods that use thermal energy include coblation and lasers.

2.2 Outline of the procedure

- 2.2.1 Tonsillectomy using ultrasonic scalpel uses ultrasonic energy to simultaneously dissect through tissues and seal blood vessels. A disposable blade is used, which vibrates at ultrasonic frequency, thereby cutting the tissue. This vibration also transfers energy to the tissue, which leads to coagulation and haemostasis. The temperature generated by the vibration is 55–100°C and is lower than that produced by other

thermal methods such as diathermy or lasers.

2.3 Efficacy

- 2.3.1 Six studies assessed pain following tonsillectomy using ultrasonic scalpel, cold-steel dissection or diathermy. Pain scores up to 7 days were similar for the three methods. Three randomised studies reported on pain at 2 weeks or more. In one study of 120 patients, only three patients reported any pain on day 14, all from the diathermy group (n = 59). In another study in which 32 patients had ultrasonic-scalpel tonsillectomy on one side and blunt-dissection tonsillectomy on the other, pain was significantly greater on the ultrasonic-scalpel side during the second week.
- 2.3.2 Return to normal diet was assessed in four studies, all of which reported that patients who had undergone tonsillectomy with the ultrasonic scalpel returned to normal diet at a similar time or earlier than those who had undergone cold-steel dissection or diathermy. In one study of 172 patients, return to normal diet was reported by 44% (43/97) of the ultrasonic scalpel group at day 1 and by 74% (72/97) at day 3, compared with 23% (17/75) and 47% (35/75) of the diathermy group, respectively. For more details, refer to the 'Sources of evidence' section.
- 2.3.3 The Specialist Advisers did not have any particular concerns about the efficacy of this procedure but noted that the evidence base was still small and that a number of the studies had methodological limitations.

2.4 Safety

- 2.4.1 Bleeding is an important complication of tonsillectomy. It can occur intraoperatively, during the first 24 hours after the operation (defined in most studies as primary haemorrhage) or after 24 hours (secondary haemorrhage). Postoperative haemorrhage may require the patient to be re-admitted to hospital and may sometimes necessitate further surgery.
- 2.4.2 In general, primary haemorrhage rates appeared to be lower with the ultrasonic scalpel than with cold-steel dissection or diathermy. In a

retrospective review of 316 patients, primary haemorrhage occurred in 1% (1/70) of patients in the ultrasonic-scalpel group, 3% (3/109) in the diathermy group and 3% (4/132) in the cold-steel-dissection group.

- 2.4.3 In a retrospective review of 407 patients, primary haemorrhage rates were 1% (1/165), 7% (7/102) and 2% (3/140) for patients treated with ultrasonic scalpel, dissection with monopolar diathermy and dissection with bipolar diathermy, respectively. However, in most of the studies other techniques (such as ligatures or diathermy) were needed in addition to the ultrasonic scalpel to achieve haemostasis.
- 2.4.4 Secondary haemorrhage rates varied among the studies. In a randomised controlled trial of 120 children, secondary haemorrhage occurred in 8% (5/61) of children in the ultrasonic group, compared with 5% (3/59) in the diathermy group, although this difference was not statistically significant. In a small randomised controlled trial of 21 patients undergoing ultrasonic-scalpel tonsillectomy on one side and diathermy on the other side, there were two cases of delayed bleeding – one with each method. Another within-patient comparative study of ultrasonic-scalpel and cold-steel tonsillectomy reported that 11% (3/28) of patients had delayed bleeding, all occurring on the ultrasonic-scalpel side. These data are in general agreement with results from the National Prospective Tonsillectomy Audit, which found that the lowest rates of secondary haemorrhage (requiring or not requiring further surgery) were associated with cold-steel dissection with suture haemostasis; higher rates were associated with other techniques such as coblation and with the use of diathermy for both dissection and haemostasis. For more details, refer to the 'Sources of evidence' section.
- 2.4.5 The Specialist Advisers stated that the safety is much the same as for any other method of tonsillectomy; however, it appeared that there is a slight increase in postoperative haemorrhage compared with cold-steel dissection.

2.5 Other comments

- 2.5.1 It was noted that the National Prospective Tonsillectomy Audit recommends that all surgeons undertaking tonsillectomy should be

trained in the use of cold-steel dissection and ligature haemostasis, as well as in the use of any electro-surgical techniques.

3 Further information

- 3.1 NICE has published [guidance on electro-surgery \(diathermy and coblation\) for tonsillectomy](#).

Sources of evidence

The evidence considered by the interventional procedures advisory committee is described in the [interventional procedure overview of tonsillectomy using ultrasonic scalpel](#), August 2005.

Information for patients

NICE has produced [information on this procedure for patients and carers](#). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

Update information

Minor changes since publication

January 2012: minor maintenance.

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Endorsing organisation

This guidance has been endorsed by [Healthcare Improvement Scotland](#).