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Coblation tonsillectomy: a double blind randomized controlled study

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Abstract

Tonsillectomy has been performed by a number of techniques. This double blind randomized controlled study compares the technique of tissue coblation with bipolar dissection for the removal of tonsils in 10 adult patients with a history of chronic tonsillitis. A significant reduction in post-operative pain and more rapid healing of the tonsillar fossae were found in the side removed by tissue coblation. There were no episodes of primary or secondary haemorrhage on either side. This new technique for tonsil removal warrants further study.

Key words: Tonsillectomy; Diathermy, Surgical; Radiofrequency; Treatment Outcome

Introduction

Tonsillectomy continues to be one of the most common procedures performed by Otolaryngologists in recent years. Despite a range of different techniques, including blunt dissection, guillotine,[1] diathermy,[2] or laser[3] and the use of multiple analgesics, post-operative pain remains the major side-effect of the operation. A prolonged period of post-operative recovery lasting up to two weeks is standard and there is always the risk of bleeding from secondary infection of the tonsil bed during this time.

Coblation (Cold Ablation, Axis Medical, Harrogate HG2 8PB, UK) is a new technique in soft tissue surgery. Recently the use of this new technique in the treatment of snoring, nasal congestion and sleep apnoea has received considerable research interest.[4,5] The system involves passing a radiofrequency bipolar electrical current through a medium of normal saline which results in the production of a plasma field of sodium ions. These ions are able to breakdown intercellular bonds and in effect melt tissue at a temperature of only 60°C. The presence of irrigating saline helps to limit the amount of heat delivered to the surrounding structures and hence reduces the amount of post-operative pain experienced by the patient. Coblation is a biopolar system and therefore requires no ground pads.

Anecdotal evidence suggests that there is considerably less pain and rapid healing of the tonsillar fossae achieved after a tonsillectomy using this technique. We aim to evaluate these two aspects of tonsillectomy morbidity with this study.

Materials and methods

Ten adult patients who were listed for a routine tonsillectomy were recruited into the study. They all had a history of recurrent tonsillitis, but there was no history of tonsillitis within the three weeks prior to surgery. Patients with a history of a quinsy, bleeding disorder or other past medical history were excluded from the study.

Patients were randomized, via numbers stored in opaque envelopes, to have one tonsil removed completely by tissue coblation, using an ArthroCare CoVac™ 70 ArthroWand®, the other by routine bipolar dissection (set at 4/10 and 50 watts power). Patients were not informed which side of their oropharynx had received which surgical technique. The same surgeon operated on the patients with the same anaesthetist in attendance, who gave them all the same immediate post-operative analgesia. Patients acted as their own controls in terms of pain threshold, tissue healing and post-operative dietary intake.

All patients were discharged some the same day of operation with co-codamol and Voltarol to take on a PRN regimen over the next nine days, as long as there were no contra-indications to either drug.

Patients were given a daily questionnaire with a visual analogue pain score for each side of their throat and space to write any other symptoms they noticed. The pain score charts consisted of a 10 cm linear scale with 10 gradations ranging from: 1 equating to no pain, to 10 equating to severe pain. They were all seen in the out-patient department on day 9 post-operation by a different surgeon, who was not aware of which technique had been used to

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TABLE I
MEDIAN DAILY PAIN SCORES (RANGE)

Day	Coblation	Bipolar	
1	5 (1–9)	7 (3–10)	$p = 0.001$
2	4 (1–6)	7 (4–10)	$p = 0.002$
3	5 (1–6)	7.5 (6–9)	$p = 0.001$
4	3.5 (1–6)	7.5 (6–10)	$p = 0.001$
5	3 (1–5)	7.5 (4–9)	$p = 0.001$
6	1.5 (1–6)	7.5 (4–10)	$p = 0.001$
7	1.5 (1–6)	6 (2–10)	$p = 0.001$
8	1 (1–3)	5.5 (1–8)	$p = 0.002$
9	1 (1–3)	4.5 (1–7)	$p = 0.002$

remove each tonsil and the questionnaire collected. An examination of their throat was carried out with a subjective measure about the area of the tonsillar fossa that was healed or covered in slough.

A comparison of the pain scores for each day and the examination findings from the throat were compared to see if there were any differences.

The results were analysed by non-parametric methods using the Wilcoxin matched-pairs signed-ranks test and *p*-values recorded.

Results

Ten adult patients were entered into the trial; they all had a history of recurrent tonsillitis. Their ages ranged from 18 to 36 years, with a mean age of 25.3 years. There were seven female and three male patients.

As visual analogue scores are not symmetrical we have used median values to compare the two sides. Table I shows the median pain scores values for each side with the range of pain scores for the two sides. These figures show several patients scoring maximal pain scores in the bipolar side, with a markedly lower range of pain scores in the corresponding coblation side for each patient.

In the fossa operated on by coblation, two points become evident. Firstly, the daily median pain scores were lower on the coblation side and secondly, there was a fall to a very low pain score after day 5, that was mirrored on the bipolar side. The bipolar pain scores reflect a normal post-operative outcome from bipolar dissection tonsillectomy with an initial rise in pain score followed by a protracted recovery period taking more than nine days for discomfort to settle. The *p*-values shown in this table comparing the medians are highly significant.

When examining the throat at nine days post-operation, there was a large difference in the appearance of the tonsillar fossae, with one side often fully healed and considerable slough present in the opposite side (Table II). Analysing the median values for the percentage area healed (coblation = 0, bipolar = 100) by the Wilcoxon matched-pairs signed-rank test is highly significant ($p = 0.001$).

No other post-operative complications were noticed or recorded on the patient questionnaires. There were no episodes of primary or secondary haemorrhage in this group of patients.

TABLE II
AREA OF SLOUGH IN EACH TONSILLAR FOSSA
(0% totally healed, 100% covered in slough)

Name	Coblation side	Bipolar side
TT	0%	50%
DA	50%	100%
LM	0%	100%
EC	0%	100%
DM	0%	100%
SA	0%	100%
ZC	25%	100%
AL	25%	100%
SC	0%	100%
EW	0%	100%

Discussion

Coblation tonsillectomy has not been previously described in the literature. While bipolar tonsillectomy has been found to be a fast and bloodless technique, it has conferred no benefits in terms of post-operative pain or rates of healing.[6] Nelson[7] has shown that the reduction of chronic obstructive tonsillar hypertrophy using Somnoplasty (a monopolar radiofrequency treatment operating at low temperatures) is a safe procedure that can be performed as an out-patient, with patients reporting minimal post-operative discomfort and were able to resume normal activities within one to two days.

Coblation tonsillectomy has been shown in this study to be significantly less painful with more rapid healing of the tonsillar fossae when compared with bipolar dissection. Questions remain about the long-term effects of the minimal amounts of tonsil tissue remaining in the fossa, but logically they should cause no more problems than persisting lingual or other pharyngeal lymphoid tissue.

With the recent changes in tonsillectomy practice, single-use coblation equipment is entirely compliant with the latest government guidelines on totally disposable instrumentation. The cost of disposable wands also compares favourably with routine disposable tonsillectomy equipment.

This study was designed purely to assess post-operative pain levels and rates of healing in coblation and bipolar dissection tonsillectomy. Very significant benefits have been demonstrated in both of these respects when using this new technology. We believe that this justifies further evaluation of this interesting technique.

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References

1 Goycoolea MV, Cubillod PM, Martinez GC. Tonsillectomy with a suction coagulator. *Laryngoscope* 1982;**92**:818–9
2 Yuan CC, Yu DY, Jun TS. Guillotine tonsillectomy without anaesthesia. *Auris Nasus Larynx* 1984;**11**:29–35
3 Martinez SA, Akin DP. Laser tonsillectomy and adenoidectomy. *Otolaryngol Clin North Am* 1987;**20**:371–6

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4 Madani M. Radiofrequency somnoplasty: A new treatment for snoring and sleep apnoea. *Int J Oral Maxillofac Surg* 1999;**1**:108–9
5 Powell NB, Riley RW, Troell RJ, Blumen MB, Guilleminault C. Radiofrequency volumetric reduction of the tongue. A porcine pilot study for the treatment of obstructive sleep apnea syndrome. *Chest* 1997;**111**:1348–55
6 Pang YT. Paediatric tonsillectomy: bipolar electrodissection and dissection/snare compared. *J Laryngol Otol* 1995;**109**:733–6
7 Nelson LM. Radiofrequency treatment for obstructive tonsillar hypertrophy. *Arch Otolaryngol Head Neck Surg* 2000;**126**:736–40

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