

Post-operative morbidity in electrodissection tonsillectomy

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Abstract

A prospective randomized study was carried out to assess the post-tonsillectomy morbidity of the electrodissection technique as opposed to the blunt dissection and ligation technique. One hundred and four patients, each serving as his or her own control, were randomized to have either the right or left tonsil removed by electrodissection. There was significantly less pharyngeal pain on the electrodissection side in the first post-operative day in adult patients. This, however, was transient as there was increased pharyngeal discomfort and otalgia, both in severity and duration, on the electrodissection side by the end of first week. There was no difference in the incidence of haemorrhage between the two techniques.

Key words: Pain, post-operative; Tonsillectomy; Diathermy

Introduction

Post-operative pain and haemorrhage are the two main causes of morbidity in tonsillectomy. The techniques of tonsillectomy have been refined over time in an effort to reduce the morbidity. Blunt dissection and ligation was the most common technique used in Great Britain. However, with the introduction of endotracheal intubation and non-explosive anaesthetic gases, diathermy has been used either to achieve haemostasis or for dissection of tonsils (electrodissection). Several trials have shown that the use of diathermy can reduce the operating time by up to a half (Papangelou, 1972; Roy *et al.*, 1976; Phillipps and Thornton, 1989). Some studies claim that diathermy increases post-operative pain (Weimert *et al.*, 1990; Salam and Cable, 1992) and/or haemorrhage (Carmody *et al.*, 1982; Siodlak *et al.*, 1985) whereas others have found no significant difference in morbidity (Phillipps and Thornton, 1989; Choy and Su, 1992; Watson *et al.*, 1993). However, most of these studies were done using diathermy for haemostasis alone. This prospective study was designed to compare the morbidity of electrodissection tonsillectomy with the cold dissection and ligation technique.

Methods

All patients over the age of seven years admitted for elective tonsillectomy were entered into the study. Patients who had adenotonsillectomy or other concurrent operations were excluded. The children were assessed with their parents pre-operatively to ascertain the cooperation and capability of the children to complete the questionnaires. The surgery was all performed under general anaesthesia by the same surgeon. The side for electrodissection was decided randomly by selecting sealed instructions from a bag whilst the patient was anaesthetized in the

theatre. The tonsils were removed with a blend of cutting and coagulation diathermy (electrodissection) on one side and blunt dissection and ligation on the other side.

Post-operatively, the patients were kept in hospital for 24 hours and the post-operative analgesia was paracetamol. In the first post-operative day, the patients were asked which side of the pharynx, if any, hurt more. They were asked to score the degree of pharyngeal pain in each side on a scale of 0–10 (0 meant they were pain free and 10 meant very severe pain). On discharge, all patients were given a questionnaire to be completed over the next two-week period. Specific questions were asked about the degree of pharyngeal discomfort, otalgia, the use of analgesia and bleeding episodes. The side of the tonsillectomy techniques used was not made known to the patient. No patient was given antibiotic preoperatively or in the immediate post-operative period.

The incidence of post-operative pharyngeal pain and otalgia on the diathermy side was compared with the ligation side. McNemar's test was used to test the null hypothesis that there was no significant difference between two sides. A statistical *p* value <0.05 was taken as significant. A power analysis suggests that at least 85 patients will be required to give an 80 per cent chance of demonstrating a 50 per cent difference in post-operative pain response.

Results

One hundred and four consecutive patients between the ages of seven and 50 years entered the study and completed the questionnaires. The mean age of the 68 females and 36 males was 18.4 years. There were 31 children, 18 girls and 13 boys, under 14 years of age. Table I shows the patients' details according to the side of diathermy.

In the first post-operative day, the mean pain score for

TABLE I
PATIENTS' DETAILS AND THE SIDE OF DIATHERMY

	Side of electrodissection	
	Right	Left
Number of patients	52	52
Females:males	33:19	35:17
Mean age in years	19.1	17.7
Children less than 14 years old	13	18

all the patients was 4.49 on the diathermy side and 5.41 on the ligation side. Non-parametric Wilcoxon's signed rank sum test showed that this difference was significant at $p < 0.002$. However, the mean pain score of the children's group (less than 14 years old) was 5.03 on both sides. There was therefore significantly less pharyngeal pain on the electrodissection side in the first 24 hours in adult patients. Tables II and III show that by the third post-operative day there was no difference on either side but after the seventh day there was increased pharyngeal pain and otalgia on the electrodissection side.

The degree of post-operative pharyngeal pain in some patients was not severe enough to require analgesic medication. Table IV shows that 74 patients (71 per cent) were using analgesic medication at the end of first week in contrast to only 19 patients (18 per cent) at the end of second week. Of those patients on analgesic medication one week after surgery, a significant number were complaining of a greater degree of pharyngeal pain on the electrodissection side ($\chi^2 = 9.45$; $p = 0.002$).

There were no reactionary haemorrhages but three patients had secondary haemorrhage between four and six days after surgery necessitating readmission for observation and antibiotic treatment. None had blood transfusion or needed surgical intervention. These three patients were between 19 and 22 years old: one patient bled from the diathermy side, the second from the ligation side and the third from both sides. However, a further nine patients (one child and eight adults) reported minor 'spotting of blood' in their completed questionnaires, occurring between the third and 12th post-operative day (mean of 5.2 days after surgery). They did not return to the unit for treatment and therefore would not have been noted except for their returned questionnaires.

Discussion

The dichotomy of opinion amongst consultant otolaryngologists in the UK on the use of diathermy for achieving haemostasis at tonsillectomy was examined by Murty and Watson (1990). A substantial proportion of surgeons

TABLE III
POST-OPERATIVE OTALGIA

Time after tonsillectomy	Side of otalgia			No otalgia	p value
	Diathermy	Both	Ligation		
First day	3	10	4	87	NS
Third day	24	15	29	36	NS
Seventh day	42	14	17	31	<0.002
Second week	28	5	9	62	<0.004

TABLE II
POST-OPERATIVE PHARYNGEAL PAIN

Time after tonsillectomy	Side of greater pain			No pain	p value
	Diathermy	Equal	Ligation		
First day	22	37	45	0	<0.008
Third day	35	38	31	0	NS
Seventh day	59	24	18	3	<0.0001
Second week	47	20	14	23	<0.0001

believe that diathermy causes more post-operative pain and haemorrhage than ligatures.

In the electrodissection technique, diathermy is used both to dissect out the tonsils and for haemostasis, thus reducing blood loss (Weimert *et al.*, 1990). This study showed that the technique was a safe procedure and did not increase the post-operative haemorrhage. The results also showed that there was a significant transient reduction in the severity of pharyngeal pain in the immediate post-operative period in adult patients. However, by the end of the first week there was more severe pharyngeal pain and otalgia on the electrodissection side. This temporal change in pain morbidity has not been described before. The delayed increased pain morbidity is probably due to the slower healing rate of the diathermy side and could be related to the extent of diathermy used. Thus, it might be reasonable to hypothesize that the difference in pain morbidity would not be observed if coagulative diathermy was used for selective haemostasis only.

This study also highlights the importance of the definition of secondary haemorrhage. There are obviously a significant number of patients who experienced a minor bleed, usually described as spotting of blood, which stops spontaneously without medical intervention. It is not clear why there was an increased incidence of blood spotting reported in adults, but this might be related to the form and quantity of food intake. The incidence of secondary haemorrhage has been shown by Phillipps and Thornton (1989) to be influenced by the patient's age. Both their study and ours showed that there was an increased tendency of post-operative haemorrhage in adults compared to children. Hence comparisons of the incidence of post-operative haemorrhage in different studies need to take this into account.

The clinical significance of the greater delayed pain morbidity of electrodissection tonsillectomy needs to be weighed against the technique's advantages. The main advantages seem to be decreased bleeding and a shorter operating time (Weimert *et al.*, 1990). The practical significance of reduced blood loss in an otherwise healthy patient is arguable. For the majority of patients, it is unlikely that any one technique of tonsillectomy can be regarded as superior to another.

TABLE IV
NUMBER OF PATIENTS ON ANALGESIC MEDICATION AND SIDE OF PHARYNGEAL PAIN

Time after operation	Side of greater pain		
	Diathermy	Equal	Ligation
Seventh day (n = 74)	40	18	16
Fourteenth day (n = 19)	11	3	5

Conclusion

Electrodissection tonsillectomy is as effective as the blunt dissection and ligation technique in the control of primary and post-operative haemorrhage. It is associated with a significant decreased severity of pharyngeal pain in the first post-operative day. However, its main disadvantage is a delayed increase in pain morbidity.

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