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Post-tonsillectomy pain with selective diathermy haemostasis

H. L. TAY, F.R.C.S.

Abstract
A prospective randomized study was carried out to assess the post-tonsillectomy morbidity of the selective diathermy technique as opposed to the ligation technique. One hundred and five patients had one tonsillar fossa haemostasis secured by unipolar diathermy and the opposite side by ligation technique. There was significantly less pharyngeal pain on the diathermy side in the first post-operative day. However, there was no significant difference between the two sides, both in pharyngeal discomfort and otalgia for the rest of the post-operative period. There was no difference in the incidence of haemorrhage between the two techniques.

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

Introduction

The relief of post-tonsillectomy pain has concerned ENT surgeons for generations. Sorethroat and earache are the common symptoms experienced in the post-operative period. Many studies have investigated various surgical methods to reduce post-operative pain. Blunt dissection and ligation was the most common technique used in the UK. However, diathermy has been increasingly used either to achieve haemostasis or for dissection of tonsils (electrodissection). In a previous prospective randomized study (Tay, 1995), it was shown that electrodissection significantly increased the delayed post-operative pharyngeal pain and otalgia. It would be interesting to see if similar results were obtained if diathermy was used to achieved haemostasis only (selective diathermy). This study, therefore, forms part of the preliminary study (Tay, 1995) and aims to investigate whether tonsillectomy using selective diathermy haemostasis results in more post-operative pain than with the ligation technique.

Methods

The methodology used in this study was described in a previous study (Tay, 1995). All patients over the age of seven years admitted for elective tonsillectomy were entered into the study. None of these patients had any symptoms of upper respiratory tract infection during the six weeks prior to admission. Patients who had adenotonsillectomy or other concurrent operations were excluded. The children were assessed with their parents pre-operatively to ascertain the co-operation and capability of the children to complete the questionnaires. The surgery was all performed under general anaesthesia by the same surgeon. The side of diathermy haemostasis was decided randomly by selecting sealed instructions from a bag whilst the patient was anaesthetised in theatre. The tonsils were removed by blunt dissection. Haemostasis was secured by ligation with linen sutures on one side and unipolar diathermy on the other side. The power settings for the unipolar diathermy were 25 Watt for children and 30 Watt for adults.

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 per-operatively 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 a 80

From the Department of Otolaryngology, Ninewells Hospital, Dundee, UK.
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TABLE I
PATIENTS DETAILS AND THE SIDE OF DIATHERMY

	Side of selective diathermy	
	Right	Left
Number of patients	53	52
Females:Males	35:18	36:16
Mean age in years	18.6	17.3
Children less than 14 years old	14	15

per cent chance of demonstrating a 50 per cent difference in post-operative pain response.

Results

One hundred and five consecutive patients between the ages of seven and 35 years entered the study and completed the questionnaires. The mean age of the 71 females and 34 males was 17.9 years. There were 18 girls and 11 boys, under 14 years of age. None of these patients had had previous hospital admission for the treatment of quinsy. Table I shows the patients' details according to the side of diathermy.

In the first post-operative day, the mean pain score for all the patients was 4.76 on the diathermy side and 5.23 on the ligation side. Non-parametric Wilcoxon's signed rank sum test showed that this difference was significant at p=0.028. There was therefore significantly less pharyngeal pain on the selective diathermy side in the first 24 hours. Tables II and III show that by the third post-operative day there was no difference on either side in the degree of pharyngeal pain and otalgia.

The degree of post-operative pharyngeal pain in some patients was not severe enough to require analgesic medication. Table IV shows that 66 patients (63 per cent) were using analgesic medication at the end of first week in contrast to only 11 patients (10 per cent) at the end of second week. Of those patients on analgesic medication after surgery, there was no statistical significant difference between those complaining of worse pain on the diathermy or ligation side.

There was one case of reactionary (first 24 hours) haemorrhage on the diathermy side who was returned to theatre and the offending vessel diathermised. One case of secondary haemorrhage was noted on the ligation side on the sixth post-operative day. None of the patients had blood transfusion. Both these patients were 22 years old. However, a further 10 other patients (two child and eight adults) reported minor 'spotting of blood' in their completed questionnaires, occurring between the third and tenth post-operative day (mean of 4.8 days after surgery).

TABLE II
POST-OPERATIVE PHARYNGEAL PAIN

Time after tonsillectomy	Side of greater pain			No pain	p-value
	Diathermy	Equal	Ligation		
First day	18	52	35	0	<0.03
Third day	25	40	39	1	NS
Seventh day	28	32	39	6	NS
Second week	24	34	15	32	NS

TABLE III
POST-OPERATIVE OTALGIA

Time after tonsillectomy	Side of otalgia			No otalgia	p-value
	Diathermy	Both	Ligation		
First day	1	6	3	95	NS
Third day	9	34	19	43	NS
Seventh day	15	26	20	44	NS
Second week	8	14	9	74	NS

Discussion

Pain presenting as sorethroat and earache is the major morbidity following tonsillectomy. The majority of patients experienced the most severe pain at the end of the first week in the post-operative period (Fenton and O'Dwyer, 1995). In an attempt to understand the factors influencing post-operative pain, many studies investigating a variety of surgical methods had been described. The use of diathermy in tonsillectomy has proved popular in a recent survey (Murty and Watson, 1990). Some studies claim that selective diathermy may increase post-operative pain in certain age groups (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).

This study has shown that apart from a transient reduction in the severity of pharyngeal pain on the first post-operative day, there was no significant difference between the ligation side and the diathermy side for the two weeks post-operatively.

In a previous study (Tay, 1995) electrodissection tonsillectomy was compared with the standard ligation technique in 104 subjects. The result showed that there was a significant transient reduction in the severity of pharyngeal pain in the immediate post-operative period. However, by the end of the first week there was more severe pharyngeal pain and otalgia on the electrodissection side. 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 hypothesise that the difference in pain morbidity would not be observed if coagulative diathermy is used for selective haemostasis only.

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

Time after operation	Side of greater pain			*p-value
	Diathermy	Equal	Ligation	
Seventh day (n=66)	18	20	28	0.185
Fourteenth day (n=11)	6	3	2	0.289

*McNemar's test.

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Despite the fact that this study and the previous one (Tay, 1995) uses the same methodology and has similar patient characteristics, the results are different especially for the delayed post-operative pain. The difference in the results could be explained by the reduction in the extent of diathermy used in selective diathermy method as opposed to the electrodissection technique. These studies seem to support the hypothesis that the extent of diathermy used in tonsillectomy has a direct influence on the *delayed* post-operative pain (after the third day). The more extensive the diathermy was used, the more delayed post-operative pain was experienced. The patients in these studies were predominantly adults and the number of children were too small to be of statistical use. Salam and Cable (1992) found no increased post-tonsillectomy pain in children with the use of diathermy and therefore the increased delayed morbidity of diathermy may not apply to children.

In conclusion, the use of selective diathermy instead of ligatures for haemostasis in tonsillectomy does not significantly alter the post-operative pain apart from a transient reduction of pharyngeal pain in the first post-operative day.

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Address for correspondence:
H. L. Tay, F.R.C.S.,
Department of Otolaryngology,
Ninewells Hospital,
Dundee DD1 9SY.

Fax: 01382 632816