

Dissection tonsillectomy: pattern of post-operative pain, medication and resumption of normal activity

P. MURTHY, F.R.C.S. (ORL), M. R. LAING, F.R.C.S.

Abstract

A prospective study of 99 adults undergoing tonsillectomy was carried out to determine the pattern of post-operative pain, intake of medication and timing of return to work and normal swallowing. The differences in the pain scores, as measured by a visual analogue scale, between every third consecutive day following post-operative day four were found to be highly significant ($p < 0.001$). Sixty-six patients (66.6 per cent) required medication in the form of analgesics and/or antibiotics after the first post-operative day. Sixty-four out of a total of 82 patients (78.2 per cent) returned to work within 14 days of surgery. Ninety-six patients (97 per cent) reported normal swallowing within 14 days of surgery. These results suggest that the majority of adult patients undergoing tonsillectomy can be appropriately advised pre-operatively regarding the probable pattern and duration of post-operative pain and the timescales they can expect to return to work and normal swallowing.

Key words: Tonsillectomy; Pain, post-operative

Introduction

Tonsillectomy in adults, a common surgical procedure, is accompanied by significant post-operative pain, referred otalgia and odynophagia. These symptoms are a result of disruption of mucosa, glossopharyngeal and vagal nerve fibres and from spasm of the pharyngeal muscles (Dempster, 1988). The actual disability experienced by patients is variable, although most patients require some form of analgesia in the initial post-operative period.

Previous studies have revolved largely around determining the influence of different operative techniques and the use of various peri-operative pharmacological agents on the post-operative morbidity. These include the use of bipolar diathermy or ligation (Choy and Su, 1992), sewing the faucial pillars together (Weighill *et al.*, 1986), KTP laser (Oas and Bartels, 1990), pre-incisional infiltration of bupivacaine (Schoem *et al.*, 1993), topical steroid injections (Liu and Su, 1996) and diclofenac (Dommerby and Rasmussen, 1984). The results of these studies have generally been inconclusive and have not led to standardization of technique and provision of analgesia. There is however a distinct lack of information on the post-operative course including the pattern of throat discomfort, and absence from work. Hence, we set out to prospectively study a group of adults undergoing tonsillectomy to assess the pattern of resolution of post-operative pain and dysphagia as well as timing of return to work.

Patients and methods

One hundred and twenty-six adult patients undergoing elective tonsillectomy were included in the study. A standardized anaesthetic technique was used in all patients. This consisted of pre-medication with temazepam 20 mg one hour before surgery, induction with intravenous propofol followed by a non-dipolarizing relaxant atracurium 600 mg/kg and alfentanil 50 microgram/kg, maintenance with nitrous oxide and oxygen and reversal with neostigmine 50 microgram/kg. All patients received intramuscular morphine 20 mg intra-operatively.

Tonsillectomy by the dissection technique was carried out in all cases and haemostasis achieved with bipolar diathermy. In the immediate post-operative period, intramuscular morphine and subsequently oral paracetamol was given for analgesia as required. All patients remained in hospital overnight and were discharged home the next day if deemed fit.

Each patient was given a form to complete, recording the severity of pain on a visual analogue scale (0 = no pain to 5 = very severe pain) every six hours for the first 14 days following surgery. The patients were advised to initially take paracetamol only for pain relief but asked to record the names of all other medication taken including other simple analgesics, prescription-only analgesics and antibiotics during the 14-day period. They were also

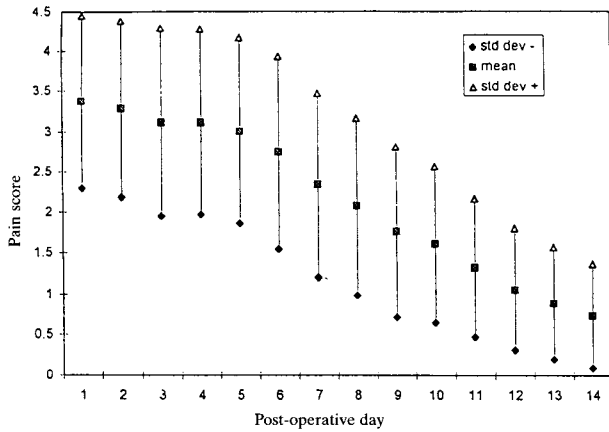


FIG. 1

Mean pain score and standard deviation for all patients for each day (n = 99)

requested to record the day that they returned to work and the day that they felt their swallowing had returned to normal.

The patients were asked to return the completed questionnaire following the study period. Mean pain scores and standard deviations were plotted. Details of post-operative medication taken were recorded and time taken to return to work and normal swallowing were noted. Changes in pain ratings on days one, four, seven, 10 and 14 were analysed using repeated measures one-way analysis of variance and the differences between the pain scores on the above days were calculated using Tukey-Kramer Multiple Comparisons test.

Results

A total of 99 correctly completed questionnaires were received and analysed (78.5 per cent respondents). The patients in this group comprised 67 females (67.7 per cent) and 32 males (32.3 per cent) with an age range of 16–53, mean 26.5 years. The mean pain score and standard deviation for the 14 post-operative days is illustrated in Figure 1. There is a trend showing very little difference in the severity of pain over the first five days with a more rapid decrease in pain experienced over the following nine days.

Assessment of difference in pain scores between post-operative days one, four, seven, 10 and 14 using repeated measures one-way analysis of variance is shown in Table I. A highly significant difference between columns ($p < 0.0001$) was obtained, indicating that variation among column means is significantly greater than expected by chance.

Changes in the pain scores and 95 per cent confidence intervals between the days studied are shown in Table II. Using the Tukey-Kramer Multiple Comparisons test, all the comparisons were significant ($p < 0.001$) except that between day one and day four ($p > 0.05$).

Table III illustrates the nature of medication taken in the post-operative period. Two-thirds (66.6 per cent) of the study group required some form of analgesia and/or antibiotics after the first post-operative day. Included in the category of simple analgesics are paracetamol, aspirin, throat lozenges, mouth washes and various over-the-counter compound preparations. The prescription-only analgesics comprised dextropropoxyphene, codeine and dihydrocodeine. Antibiotics prescribed by general practitioners to 23 patients (23.2 per cent) included penicillin, erythromycin, amoxycillin, cotrimoxazole, co-amoxiclav and cefixime.

Of the 82 patients who were working prior to surgery, 64 (78 per cent) returned to work within 14 days with the majority (56 per cent) requiring between 10 and 14 days absence from work (Figure 2). Eight (10 per cent) of the remaining 18 patients returned to work later than 14 days after surgery due to social reasons, three patients (four per cent) had prolonged throat symptoms that prevented earlier resumption of employment and seven (eight per cent) did not state their reasons for their prolonged absence from work.

The time taken to return to normal swallowing is shown in Figure 3. Ninety-six patients (97 per cent) felt that they had recovered painless swallowing within 14 days of surgery. The remaining three patients with persistent throat discomfort were the same as those that required prolonged absence from work for the same reason.

Discussion

Post-tonsillectomy pain has anecdotally been believed to often be worse around the fifth day following surgery. This has not been borne out in a review of the literature and a recent study has also refuted this opinion (Toma *et al.*, 1995). Although a varying degree of pain is universally experienced by all patients, the highly individualized tolerance and subjectivity of pain make objective comparison between individuals difficult. In clinical practice, the visual analogue scale has now been firmly established as a reliable method for the subjective recording of pain (Revoll *et al.*, 1976).

TABLE I
REPEATED MEASURES ANALYSIS OF VARIANCE OF CHANGES IN PAIN RATINGS ON POST-OPERATIVE DAYS ONE, FOUR, SEVEN, 10 AND 14

Source of variation	Degrees of freedom	Sum of squares	Mean square
Diurnal (between columns)	4	644.18	161.05
Individual (between rows)	98	172.63	1.7616
Random (residual)	392	272.64	0.6955
Total	494	1089.5	

F = 231.6, df = 4,392, $p < 0.0001$ for significant difference between columns (days one, four, seven, 10 and 14)

TABLE II
CHANGES IN PAIN SCORES BETWEEN POST-OPERATIVE DAYS ONE, FOUR, SEVEN, 10 AND 14

Comparison of mean scores	Mean difference	Tukey-Kramer Multiple Comparisons Test p value	95% C.I.
Day 1 vs Day 4	0.2190	$p > 0.05$	-0.1058-0.5438
Day 1 vs Day 7	1.0516	$p < 0.001$	0.7268-1.3764
Day 1 vs Day 10	2.3612	$p < 0.001$	2.0364-2.6860
Day 1 vs Day 14	2.8686	$p < 0.001$	2.5438-3.1934
Day 4 vs Day 7	0.8326	$p < 0.001$	0.5079-1.1574
Day 4 vs Day 10	2.1422	$p < 0.001$	1.8174-2.4670
Day 4 vs Day 14	2.6496	$p < 0.001$	2.3248-2.9744
Day 7 vs Day 10	1.3096	$p < 0.001$	0.9848-1.6344
Day 7 vs Day 14	1.8170	$p < 0.001$	1.4922-2.1417
Day 10 vs Day 14	0.5074	$p < 0.001$	0.1826-0.8321

Oropharyngeal discomfort and odynophagia following tonsillectomy arises mainly from the muscles that form the tonsillar fossa. The source of the pain is exposed nerve endings as well as chemical mediators of inflammation and ischaemia such as lactic acid, leukotrienes and prostaglandins. The presence of these agents is accompanied by muscle spasm that further contributes to ischaemia and leads to a protracted cycle of pain (Salassa *et al.*, 1988). Another theory is that muscle pain actually originates in vascular structures and connective tissues such as tendons, muscle insertions and joint capsules (Bud, 1981). This concept is supported by the fact that primary muscle diseases have little associated pain or muscle tenderness, whereas the collagen disorders involving primarily connective tissue and neural tissue are associated with significant muscle pain.

Methods designed to combat post-tonsillectomy pain have been targeted to controlling raw traumatized nerve endings, central pain perception, local products of inflammation and anoxia, and muscle spasm. Previous studies which have focused on the use of local anaesthetic agents, non-steroidal anti-inflammatory drugs, steroids, centrally-acting narcotic analgesics and the use of various surgical techniques have met with mixed results. However, prior to conducting valid trials on the various surgical and pharmacological modalities available, it is essential to obtain some baseline information on the course of the patient's post-operative symptoms as well as their effect on disruption of lifestyle and occupation.

The above study was carried out to determine the pattern and course of post-operative throat discomfort and its effect on swallowing and normal activity

TABLE III
MEDICATION TAKEN IN POST-OPERATIVE PERIOD AFTER DISCHARGE
(14 DAYS, N = 99)

Medication	Number of patients (%)
Simple analgesics only	25 (25.25)
Prescription analgesics only	12 (12.12)
Simple + prescription analgesics	6 (6.06)
Antibiotics only	8 (8.08)
Analgesics + antibiotics	15 (15.15)
No medication	33 (33.33)
Total	99 (100.0)

following tonsillectomy. Our findings show that the pain persisted relatively unchanged for the first four days and comparison of pain scores between day one and day four showed a difference which was not significant ($p < 0.05$). Following day four, the mean pain scores showed a progressive decrease until day 14 with a significant difference in the scores between any two of days four, seven, 10 and 14 ($p < 0.001$). Although an attempt was made initially to standardize the mode of analgesia by asking all patients to confine their intake to paracetamol only, as many as 41 per cent required additional medication in the form of stronger analgesics or antibiotics for severe symptoms. Ideally, a true reflection of the pattern of post-operative throat discomfort would only be obtained if all patients refrained totally from taking any form of analgesia. It would however be unethical to expect this course of action, especially in the case of patients with high mean pain scores.

Ninety-seven per cent of all patients recovered normal pain-free swallowing and 78 per cent of working patients resumed their duties within 14 days. Taking into account the patients who delayed returning to work for social reasons, these figures closely reflect the pattern of post-operative pain which had reached absent or comfortable levels by day 14.

In conclusion, our study demonstrates that the pattern of post-operative pain in the vast majority of adults undergoing tonsillectomy is that of sustained pain of moderate to severe intensity for the first four to five days followed by a progressive decrease in the degree of pain. The symptoms can be experienced up to day 14 and are accompanied by a proportionate

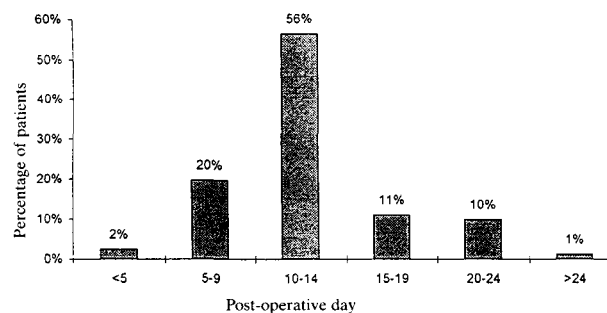


FIG. 2
Time taken to return to work (n = 82)

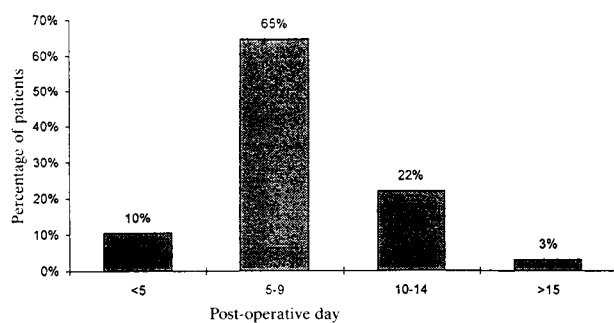


FIG. 3

Time taken to return to normal swallowing (n = 99)

degree of difficulty with swallowing. Most patients can expect to return to work within 14 days of surgery. The above information is useful for the purpose of advising patients appropriately in the pre-operative period regarding the post-operative course and the likely requirement for sick leave.

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Address for correspondence:
Mr P. Murthy, F.R.C.S. (ORL),
Department of Otolaryngology,
Head and Neck Surgery,
Raigmore Hospital NHS Trust,
Inverness IV2 3UJ.