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Adult obstructive sleep apnoea syndrome and tonsillectomy

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Abstract

A surgical cure for adult obstructive sleep apnoea syndrome (OSAS) is an attractive alternative to nasal continuous positive airway pressure, but current research suggests that uvulopalatopharyngoplasty is not effective in all patients. No subgroup of these patients, who might benefit from surgery to the oropharynx, has as yet been identified. In this study we examined the results of tonsillectomy either as an isolated procedure or as part of uvulopalatopharyngoplasty in seven patients, who had tonsillomegaly. In all seven there was a short-term improvement between the pre-operative and post-operative apnoea/hypoapnoea (A/H) index (100-65 per cent), which could not be accounted for by change in the body mass index (BMI). In one patient a diagnosis of Non-Hodgkin's lymphoma was made from histological examination of the tonsils. The results suggest that adult patients with tonsillomegaly may represent a subgroup of patients with OSAS, who would benefit from surgery aimed at the oropharynx.

Key words: Sleep apnoea syndrome; Apnoea, obstructive; Tonsillectomy

Introduction

It is commonly reported that childhood obstructive sleep apnoea syndrome (OSAS) can be cured by tonsillectomy (Croft *et al.*, 1990; Zucconi *et al.*, 1993) as the commonest cause of the obstruction is tonsillomegaly. Enlarged tonsils are far less common in adults due to progressive involution after the age of seven years. The treatment of adult OSAS usually consists of non-surgical therapies such as weight correction and nasal continuous positive airway pressure. With the exception of tracheostomy surgery is considered to be less successful.

The results of uvulopalatopharyngoplasty for adult OSAS both in the short- and long-term are conflicting. Early reports suggested a successful short-term outcome in up to 50 per cent of patients following surgery (Fujita *et al.*, 1985) both in the subjective improvement of the patient and as recorded by polysomnography. However, recent studies are more pessimistic about the value of uvulopalatopharyngoplasty with several commenting upon the need for prolonged evaluation of these patients post-operatively in order to assess the long-term objective benefit from surgery (Walker *et al.*, 1989; Shoa-Jung *et al.*, 1995). It has also been widely reported that there is a poor correlation in the patient's subjective response to uvulopalatopharyngoplasty and the post-operative results of polysomnography (Walker *et al.*, 1989; Shoa-Jung *et al.*, 1995). At present there are few predictors of outcome for surgery in OSAS although there is evidence that uvulopalatopharyngoplasty with tonsillectomy may be beneficial in adults with tonsillomegaly (Walker *et al.*, 1989). In our retrospective study on seven selected adults with OSAS, who had clinically enlarged tonsils, we have demonstrated improvement in the apnoea/hypoapnoea (A/H) index following tonsillectomy, either as an isolated procedure or as part of uvulopalatopharyngoplasty.

Methods

This was a retrospective study of patients with documented sleep disordered breathing noted to have large tonsils. Seven patients were identified between 1990 and 1995. All patients presented to ENT surgeons at several district general hospitals and were referred to the regional sleep laboratory for investigation of antisocial snoring both with, and without, symptoms of excessive daytime sleepiness. The body mass index (BMI) was recorded both pre- and post-operatively. Breathing during sleep was documented by one of the following investigations: pulse oximetry (Ohmeda, 3700), respiratory monitoring (Densa DMS 100), or polysomnography (CNS CASS). Three patients successfully used nasal continuous positive airway pressure and one patient required tracheostomy prior to tonsillectomy. Tonsillectomy with or without palatal resection was performed by the referring ENT surgeon. Within

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TABLE I
SUMMARY OF RESULTS

Case	Age	BMI		Operation	A/H index	
		Pre-op	Post-op		Pre-op	Post-op
1	48	27.6	28	T	56	4
2	48	30.4	28.4	T	49	10
3	32	28.3	26	T/UVPP	56	20
4	43	33.2	32.4	T	70	3
5	38	44.9	41.5	T	42	1
6	42	25.2	25.4	T	56	0
7	34	27.5	27.5	T/UVPP	27	11
Mean	41	31	30		51	7

three months of the procedure each patient underwent repeat investigation of breathing during sleep in the regional sleep laboratory.

Results

All seven patients were males ranging in age from 31 to 52 years (mean 40) and with a pre-operative BMI range of 25 to 45 (mean 31) (Table I). Each patient was diagnosed as suffering from OSAS by overnight investigation with a pre-operative range in the A/H index of between 27 to 70 episodes per hour (mean 51). Five of the patients underwent tonsillectomy in isolation and in the remaining two it formed a part of a uvulopalatopharyngoplasty. There were no post-operative complications. Histological examination of the tonsils revealed a non-Hodgkin's lymphoma in one of the patients. One patient had undergone a tracheostomy for OSAS prior to the tonsillectomy. In three of the patients there was no evidence of weight loss after the procedure and in the remaining four the weight loss was slight (Figure 1). All patients demonstrated improvement in their A/H index following surgery (Figure 2).

Discussion

This study was performed retrospectively on a small number of selected patients with severe OSAS all of whom had large tonsils. Previous studies have reported conflicting evidence on the value of uvulopalatopharyngoplasty in OSAS in adults, both in the short- and long-term, and few studies have commented on the size of the tonsils in adults. Early reports suggested that uvulopalatopharyngoplasty

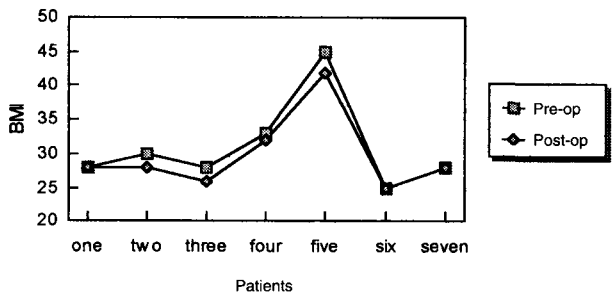

FIG. 1
Comparison of pre- and post-operative body mass index (BMI) in patients undergoing tonsillectomy.

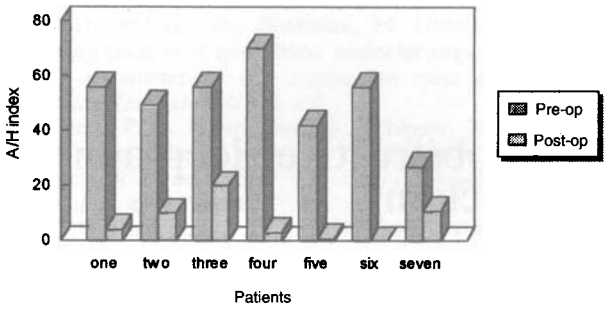

FIG. 2
Comparison of pre- and post-operative apnoea/hypoapnoea (A/H) index in patients undergoing tonsillectomy.

was successful in the short-term, at both relieving the patients' symptoms and improving the features of OSAS as recorded by polysomnography (Conway *et al.*, 1985; Fujita *et al.*, 1985). Fujita *et al.* in 1985 reported an almost complete reversal in the signs and symptoms of OSAS in 33 out of the 66 patients studied and Conway *et al.* (1985) in a follow-up paper showed that in the 20 of these 33 patients that could be contacted all maintained their improvement as recorded by polysomnography after 12 months. Whether or not this improvement continues has been questioned in a recent report by Shoa-Jung *et al.* (1995), who followed up 15 patients for five years post-operatively and described evidence of deterioration in polysomnographic findings at the first evaluation (between three to 12 months) and those performed at five years. This deterioration could not be accounted for by change in the patient's weight.

Perhaps what is more disturbing than the suggestion of a deterioration in the long-term effects of surgery are the recent reports which indicate that uvulopalatopharyngoplasty has no effect upon adult OSAS. Walker *et al.* (1989) in a prospective study of 11 patients who underwent uvulopalatopharyngoplasty for adult OSAS and were followed up with repeated polysomnography at three and 12 months showed an improvement in only one patient. Interestingly, it was noted that this patient was the only one to have enlarged tonsils. This finding would be in keeping with the improvement recorded following surgery in our study. Walker *et al.* (1989) contended that few previous studies were based upon strict criterion for both pre- and post-operative polysomnographic recordings for outcome measures. Certainly there is agreement now amongst many researchers that the patient's subjective response to surgery correlates poorly with post-operative results of polysomnography, and the doubt that exists as to the value of uvulopalatopharyngoplasty in adult OSAS has led many centres to restrict the use to the treatment of snoring only (Sharp *et al.*, 1990). Much has been published concerning the symptomatic improvement in snoring that can be obtained by uvulopalatopharyngoplasty (Croft and Golding-Wood, 1990; Sharp *et al.*, 1990). As we were

operating upon these patients in an attempt to cure OSAS we have restricted our outcome measures to objective results.

The situation in children who suffer from OSAS may differ from that in adults. As early as the 1960s there was evidence that intermittent airway obstruction occurring during sleep could lead to pulmonary hypertension, cor pulmonale and cardiac failure in children and that there was the potential for reversal if adenotonsillectomy was performed (Menashe, 1965; Noonan, 1965). Zucconi *et al.* (1993) obtained short-term nocturnal polysomnographic results in 14 out of 60 children studied and showed that pathological respiratory events were eliminated in all but three of the children after surgery. It is postulated that OSAS in childhood is related to the ratio of tonsillar size to the oropharyngeal diameter. The relative widening of the airway that occurs following adenotonsillectomy leads to the improvement in breathing during sleep. However, it can be difficult to compare results of these studies in children and adults because of differences in the authors' definitions of OSAS and in the range of surgical procedures performed by different authors. These can vary within a study, or between studies, from adenoidectomy, adenoidectomy with monotonsillectomy, and adenoidectomy with bilateral tonsillectomy making statistical analysis difficult. There is also little long-term data published on the value of adenotonsillectomy in childhood OSAS.

Despite these reservations the improvement in childhood OSAS that can be obtained by tonsillectomy raises the possibility of a similar effect in adults. Woodhead *et al.* demonstrated a high incidence of adult OSAS (46 per cent) in the 35 patients referred with heavy snoring and has shown that it is possible to correlate closely (94 per cent) the results of polysomnography with the classifications of the loudness of the snoring and the clinical appearance of the oropharynx (Woodhead *et al.*, 1991). At present there are no reliable predictors of outcome in OSAS and although emphasis is often placed upon clinical examination and the findings of sedation nasendoscopy, there is remarkably little information as to the size of the tonsils in those studies that evaluate uvulopalatopharyngoplasty in adult OSAS. We were encouraged by the success of the procedure in those who we identified as having large tonsils although the size was not objectively assessed. The improvement in the A/H index was the least marked in the two patients who underwent tonsillectomy as part of a uvulopalatopharyngoplasty, which may be an indication that the tonsils were relatively smaller. Although four of our patients did lose weight postoperatively this loss was slight and we believe that the improved A/H index in all patients was a result of surgery. However, it remains to be seen whether this improvement is sustained in the long-term. It is interesting to note that neoplasia was diagnosed on histological examination of the tonsils in one patient and that the tonsillectomy cured his OSAS. This serves to remind us that enlarged tonsils may harbour significant disease as well as causing OSAS.

A surgical cure for OSAS is an attractive alternative to nasal continuous positive airway pressure, which requires patient compliance, and also avoids the potential complications of tracheostomy. However, it is important that any improvement from surgery is measurable and does not rely upon the subjectivity of the patient. If the patient's snoring lessens it may be difficult to persuade them that nasal continuous positive airway pressure is still required despite the evidence of post-operative polysomnography. A lack of objectivity in the measurements of outcome may account for the high reported success rate of uvulopalatopharyngoplasty reported in some studies. Although there is conflicting evidence as to the value of uvulopalatopharyngoplasty in OSAS we believe that it may be possible, by estimation of the tonsillar size, to select those patients who will benefit from surgery. It is possible to argue that because the patients in this study have tonsillomegaly, they are precluded from having idiopathic OSAS and we have been careful to avoid using this term. However, the classification of OSAS is often arbitrary and at present there are no useful predictors of outcome for surgery. We believe that emphasis should be placed upon the size of the tonsils during clinical examination because those patients in whom they are enlarged will benefit from tonsillectomy either in isolation or as part of a uvulopalatopharyngoplasty.

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