

Modified Palatal Stiffening Procedure for Snoring

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ABSTRACT

Objective: To evaluate the efficacy of a modified procedure of palatal stiffening for the treatment of snoring.

Study Design: A quasi-experimental study.

Place and Duration of Study: ENT, and Head and Neck Surgery Departments of Pakistan Air Force (PAF) Hospital Masroor, Combined Military Hospital (CMH) Rawalpindi and PAF Hospital Sargodha, from January 2000 to January 2005.

Methodology: Patients of either gender and above 20 years of age having snoring as their primary complaint were registered. Patients with an obvious cause of upper airway obstruction like oropharyngeal swelling, growths and obstructive sleep apnea were excluded. A grading system was designed to classify the patients according to severity and criteria for successful outcome defined; grades were equated with VAS. Palatal stiffening was achieved by using an insulated 22 gauge LP needle for infiltration cauterization. Results were analyzed at 6 weeks post operatively on SPSS-16. Paired t-test was applied to compare the improvement in snoring and significance was tested at p-value less than 0.05.

Results: Forty four (44) patients underwent the palatal stiffening procedure. Male to female ratio was 42:2. Twenty eight (28) patients (63%) had complete resolution of symptoms after first surgery. Out of the remaining, ten more patients (22.72%) became symptom free after 1st revision surgery while six patients (12.5%) needed 2nd revision. Pain in throat was the main post operative complaint which settled in 10 to 14 days.

Conclusion: Palatal stiffening procedure causing relatively less morbidity, simple and minimally invasive, but effective at the same time.

Key words: Snoring. Sleep apnoea. Palatal surgery. Palate stiffening.

INTRODUCTION

Snoring is the hallmark symptom of a spectrum of sleep related breathing disorders collectively termed as sleep disordered breathing. The pathophysiological cause of sleep disordered breathing is sleep induced airway obstruction. Approximately 20% of all adults including 50% of those over 60 years of age are chronic snorer.¹ Minimal obstruction causes primary or simple snoring. On the other extreme complete obstruction causes obstructive sleep apnea syndrome (OSAS).² OSAS traditionally receives more attention than snoring because of its well documented influence on the mortality. It is now evident that untreated snoring also has medical and social implications. Although there is no convincing evidence that snoring in the absence of sleep apnea is an independent risk factor for cardiovascular diseases but it is becoming an important social problem between spouses and inmates.³ Continuous snoring usually does not have any sleep disturbing effects. It is also a major problem where there is concentration of more people in a single room or sharing of room between room mates like inmates of hostels and military barracks. Habitual snoring, nocturnal apnea, and excessive daytime sleepiness are

leading symptoms of the obstructive sleep apnea syndrome.⁴ Large number oronasal and dental devices have been devised for its treatment with variable results.⁵ Surgical treatments of the snoring are usually focused at retropalatal pharynx and retrolingual pharynx.^{6,7} All patients who complain of snoring should attempt conservative treatment first, as these are simple, safe and part of healthy life style therapy. Surgery for snoring is performed in stepwise manner, usually beginning with the palatal procedures then if necessary, progressing to other procedures.⁸ The aim of this study was to determine the efficacy of a modified procedure for palatal stiffening which was less invasive.

METHODOLOGY

This was a quasi-experimental study carried out at the departments of ENT, and Head and Neck Surgery PAF Hospital Masroor (January, 2000 to April, 2002), Combined Military Hospital Rawalpindi and PAF Hospital Sargodha (May, 2002 to June, 2005). Patients primarily complaining of snoring were included in this study as reported by spouse or other relative/room-mate. Patients with obvious cause of snoring like oropharyngeal swellings, growths, obstructive sleep apnea and day time hyper somnolence were excluded from the study. Severity of snoring was classified as following:

Grade 1 = mild snorer (spouse or other person can sleep in the same room with unaided ears). Grade 2 = Moderate (spouse or other person can sleep in the same room

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with aided ears). Grade 3 = Severe (spouse or other person can not sleep in the same room with aided ears). Grade 4 = Unbearable snoring (snoring can be disturbing in the side / neighboring room). A change of grade from worse to better grade was labelled as successful outcome.

To rule out OSAS, patients were admitted a day before surgery in the main ITC where 06 hours night sleep was monitored with holter monitoring and pulse oxymetry. Fiberoptic examination of the upper aerodigestive tract was also carried out.

Forty four (44) patients having snoring as their primary complaint were selected by convenient sampling. Informed consent was taken from all the patients. Customized equipment was used for the surgical procedure. Twenty two (22) gauge LP needle was insulated by applying tubing of the butterfly and was used for infiltration cautery. Long needle 15 cm in length with insulation was used to cut the free end of the uvula and soft palate with cutting cautery. About 4 to 6 mm of the posterior free margin of the soft palate and uvula was excised from one posterior tonsillar pillar to the other with the cutting cautery (sparing the pillars) (Figure 1). Care was taken to avoid damage to the posterior pharyngeal wall. Electric cautery of Mertin Membi was used. Infiltration cautery of the soft palate with coagulation cautery at 15 to 20 different places was done for 15 seconds with insulated LP needle as shown in the picture till the surrounding margin of the cauterized palate of about 2 mm (2-4 volts) became white (Figure 2). The LP needle was insulated in such a manner that its distal 4 mm was naked and it could go into the depth of the soft palate. Thirty four (34) cases were done under GA with orotracheal intubations while ten cases (10) were done under local anaesthesia on patient's choice. Post-operatively patients were advised soft diet particularly milk diet for first 24 hours. No antibiotics were advised except in one case who suffered from diffuse swelling and pain post-operatively. Most of the patients (15) were discharged 4 hours after the full recovery from GA, while others were discharged on the next day. Those cases, in which the surgery was done under local anaesthesia were discharged 3 hours after the surgery. Follow-up was done weekly for first 2 weeks then twice weekly for the next 04 weeks. Results were analyzed at 6th week post-operatively. Pre and post-operative change in palatal stiffening is shown in one of the patient in (Figure 3 and 4). Revision was offered to 16 cases only. While 02 cases refused revision. Patients were classified into above four (4) categories for study purpose.

Data was analyzed using SPSS version 16. Mean and standard deviation (SD) were calculated for age, weight, and height. Frequency (percentages) were used to describe gender, grades of severity and success rate.

Pre and post-operative severity of snoring was compared using chi-square test at p-value of 0.05; values less than 0.05 were considered significant.

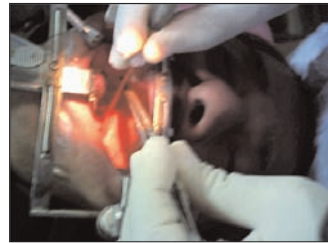


Figure 1: Cutting of the posterior margin of the soft palate including uvula from one posterior pillar to the other.

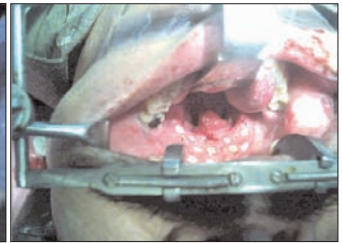


Figure 2: Infiltration cautery of the soft palate with coagulation cautery at 15 to 20 different places.



Figure 3: Pre-operative large boggy soft palate.



Figure 4: Pre-operative scarred and shortened hard palate (same patient as in Figure 3).

RESULTS

A total number of 44 cases participated with primary complaints of snoring between January 2000 to June 2005 for this interventional study. There were 42 males and 2 females. The age of patients varied from 23 years to 58 years. Average weight of patients was 78 kg with a weight range of 65 to 91 kg. Height of the male patients ranged between 1.77 meter to 1.9 meter with an average of 1.832 meter.

Out of 44 selected patients, 22 were in grade III, 14 patients were in grade II, while 4 each were in grade I and grade IV snorers. After first surgery the result in grade I was 100% (4 patients), while the result of grade 2 and 3 was 71.42% (10) and 63.63 (14), while all the patients in grade IV needed revision, although their extent of severity reduced (Grade changed from IV to III or II) (Table I). After 1st revision, result in the grade II also became 100%, while 04 more patients improved after surgery in grade III. Two patients in grade IV improved, while the other 2 were offered 2nd revision which they refused although their grading changed (Table II). Significant statistical change was noted after treatment ($p=0.001$).

The commonest post-operative complication was pain which became maximum on 4-7th post-operative day and settled down on 10th post-operative day usually completely within 02 weeks. Pain was minimized when mucosal ulceration do not occur. Bleeding was usually mild except in one case in which underlying vessel in the

Table I: Results after 1st surgery for total patients.

Severity	Number of patients	Successful after 1st surgery	Patients needed revision	Result (%)
Grade I	4	4	0	100%
Grade II	14	10	4	71.4%
Grade III	22	14	8	63.6%
Grade IV	4	0	4	0

Table II: Results after 1st revision surgery for all patients.

Severity	Number of patients	Successful after 1st surgery	Patients needed revision	Result (%)
Grade I	0	0	0	100%
Grade II	4	4	0	100%
Grade III	8	4	4	81.8%
Grade IV	4	2	2	50%

palate got punctured. It was controlled by applying quilting ligature. Swelling of the uvula and palate became maximum on 2nd day leading to plummy character of the sound along with pain. It settled down on 6-7th post-operative day. There is mild velopharyngeal incompetence in 12 cases which settled within the first three weeks time. There was ulceration of the mucosa in 2 cases with mild hemorrhage; this was reduced in subsequent cases by ensuring proper insulation of the needle and controlling the voltage of the cautery. Odynophagia was the prominent complaint after the procedure starting from day 3 to 10th day, maximum between 4th to 7th day and it resolved mostly on the day 12.

DISCUSSION

Simple snoring without apnea is a common problem affecting 40% population of the middle aged and above with strongly male predominance.³ Sleep apnea syndrome and obesity are directly related however, most of the patients of primary snoring are non-obese.⁹ It has got almost uniform demographic and racial distribution. Patients with primary snoring often complain of great distress and social embarrassment and therefore request professional help.^{3,9,10} Thus the otorhinolaryngologist has to consider different treatment options that are possible and sensible.¹ Apart from behavioral changes and general measures (weight loss, reduction of alcohol consumption, sleep position training, etc.), different forms of surgeries are available for its treatment. Surgery for snoring is rationally performed in a stepwise manner, usually beginning with procedure that address palatopharynx and if necessary, progressing to procedures that correct other levels of airway obstruction like base of tongue.^{3,7,11} A number of techniques have been described to improve patient selection for snoring surgeries. Objective measurement such as the muller maneuvers and sleep nasendoscopy attempt to identify palatal snorers, but the reliability of each of these procedures has been brought into question.^{5,9} More recently, acoustic analysis

respiration (SNAP testing) has shown promise as a technique to identify the low frequency of velum-like snoring. It is difficult to interpret the results of various studies because of the lack of standardized methods to report snoring outcomes.¹² Several promising measurement techniques are now used. The subjective recording of surgery outcomes on a standardized visual analog scale is the most prominent of the new techniques, and its use will lessen some of the confusion.⁹

The otolaryngologist should customize palatal snoring surgery in accordance with the patient's anatomy, the patient's social and financial concerns, and with his or her own practice parameters. There are four major surgical techniques in vogue now a days to treat snoring. These are uvulopalatopharyngoplasty (UPPP), laser assisted uvuloplasty (LAUP), radiofrequency ablation (RFA) and palatal stiffening procedure with electric cautery. UPPP is preferred for the snorer with a redundant posterior pharyngeal wall or large tonsil. It is more cumbersome, require hospitalization and is associated with more severe post-operative pain and complications.^{10,14} LAUP is attractive for compliant patients with large posterior tonsillar pillars and where laser equipment is readily available. RFA should be considered when a radiofrequency generator and disposable hand pieces are available.^{7,8}

The palatal stiffening operations using electric cautery can be performed as a single office procedure under local anesthesia with minimal expenses. Palatal scarring is the common denominator of all snoring surgeries, so it is logical to use technique that induce as much scarring as possible without unnecessary disturbing velopalatal function. In this study, a modified procedure was used for palatal stiffening. An insulated 22 gauge LP needle was used for infiltration cautery of soft palate and uvula. Satisfactory results were achieved in terms of control of symptoms and patient satisfaction. A total of 44 patients were operated out of which 10 were done under local anaesthesia in office setting. This procedure was not much invasive with good patient compliance.

Radiofrequency ablation (RFA) of the soft palate is also minimally invasive procedure, however it is less effective as single stage procedure.

Back and colleagues studied 32 patients who received RFA surgery of soft palate. Their 5.9% patients were cured by first surgery, whereas in this study 63.6% patients became symptom free after 1st surgery.¹³ Cekin and colleagues performed UPPP and UPF as treatment of primary snoring. Their success rate was higher (85% and 83.3% respectively),¹⁴ as compared to 63.6% in this study. However, these procedures were more invasive and duration of pain was significantly longer.

Yourk *et al.* have combined two modalities of treatment for the management of primary snoring. They have

combined radiofrequency assisted uvulopalatoplasty (RAUP) and uvulopalatopharyngoplasty (UPPP) and achieved satisfactory results in 87% of their patients,¹⁵ which was better than the presently reported. The short-term results in this study are very encouraging. This is probably the first study of its kind in Pakistan; however, it has limited number of patients. It needs further evaluation with more number of patients and prolong follow-up for the long-term results.

It should be emphasized that the procedures discussed in this study address palatal snoring exclusively, and they make up only one component of the management of snoring patients. All patients with complaints of snoring should attempt conservation therapy first because it is simple, and part of a healthy lifestyle.

CONCLUSION

Palatal stiffening procedures are relatively less morbid, simple and minimally invasive. They do not interfere with velopharyngeal function. By simply stiffening the palate rather than shortening, it can reduce the flutter and hence snoring.

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