

Uvulopalatopharyngoplasty and Uvulopalatal Flap for the Treatment of Snoring: Technique to Avoid Complications

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Objective: To review the outcome of 50 snoring patients treated with uvulopalatopharyngoplasty and uvulopalatal flap, looking for a decrease in the surgical complications rate.

Design: A longitudinal, prospective, self-controlled pilot study.

Setting: Sleep Disorders Clinic of the National University of Mexico and Angeles Lomas Hospital.

Material and Methods: Fifty consecutive patients underwent surgical treatment for snoring. The Müller manoeuvre was performed in all of them to determine the site of obstruction. In all cases, the bed partner was asked about the presence of snoring before and 6 months after the procedure. Polysomnography was performed before and after the surgery to assess sleep apnea in all patients and to determine the success regarding the snoring index. Every complication was registered.

Results: All patients had only habitual snoring, without sleep apnea. Thirty-eight males and 12 females were included in the study. At the sixth postoperative month, the bed partner of 48 patients (96%) reported that snoring was gone, 2 (4%) said that snoring was no longer a problem, the initial snoring index mean was 214, and 6 months after the procedure it decreased to 12. No patients had any complication related to the surgical procedure.

Conclusions: Despite the fact that there are a number of techniques for snoring and sleep apnea, we achieved good postoperative results while avoiding the most common complications.

Key words: snoring, uvulopalatal flap, uvulopalatopharyngoplasty

The relationship between cardiac and brain conditions and snoring is well known. In a series of 177 patients, Palomaki and colleagues found that stroke occurred often immediately after awakening, and snoring seemed to be associated with the diurnal variation of brain infarction.¹ Guilleminault and colleagues, in 1983, reported an association of cardiac arrhythmias and conduction disturbances with sleep-disordered breathing.²

Many treatments are currently available for snoring and obstructive sleep apnea (OSA): behavioural and

medical interventions (diet, nasal steroids, mandibular advance devices, continuous and bilevel positive airway pressure),^{3,4} surgical procedures ranging from bariatric surgery to laser-assisted uvulopalatoplasty (LAUP), and radiofrequency volumetric reduction.⁵⁻⁷ All of these treatment methods have shown a variable degree of efficacy.

In 1981, Fujita and colleagues described uvulopalatopharyngoplasty (UPPP) as a surgical procedure useful to treat snoring and OSA, and it remains the most commonly used.⁸ However, the long-term results of this and other surgical treatment modalities seem to be disappointing, owing perhaps to a poor preoperative evaluation.^{9,10} On the other hand, complications may appear, and many of them have been described (nasopharyngeal stenosis, palatal incompetence, bleeding, wound dehiscence, dysphagia, and speech disorders), and their incidence is relatively high.^{11,12} Powell and colleagues, in 1996, reported a new uvulopalatal flap (UPF) technique that reduced the risk of presentation of complications such as velopharyngeal incompetence and stenotic scar but achieved good postoperative results.¹³

The success of the treatment is also related to the accurate localization of the site of airway obstruction.

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DOI 10.2310/7070.2008.0053

Regarding this point, there are some diagnostic modalities: head and neck examination, cephalometric x-ray assessment, and fibre-optic nasopharyngeal endoscopy with the Müller manoeuvre.¹⁴⁻¹⁶ All of them remain controversial, but at least one of them should be included in every patient evaluation.¹⁷ We should remember that the obstruction may be located at any place of the upper airway: nasal septum, turbinates, adenoids, tonsils, soft palate, uvula, anterior and posterior pillars, base of the tongue, and epiglottis. The role of the redundant posterior pillars in sleep-disordered breathing is often underestimated or even forgotten, leading frequently to failure of the surgical treatment.

We present a modification of the traditional UPPP technique, which achieves a wider airway but without the complications owing to excessive tissue removal and with a UVP that helps the soft palate to gain stiffness, avoiding palatal vibration, which could lead to snoring. Finally, it is potentially reversible if persistent velopharyngeal incompetence is found in the postoperative period.

Methods

Fifty consecutive patients were included in this study, with snoring being the only complaint (primary snoring, with a respiratory distress index [RDI] < 5). Appropriate informed consent was obtained from all of them, and clinical procedures were performed to conform to the Declaration of Helsinki. The diagnosis was made based on the clinical and polysomnographic findings. The Müller manoeuvre was performed in every patient to determine that the obstruction level was located only at the soft palate and uvula. Any patient with base of the tongue or nasal obstruction was excluded.

The 50 patients underwent UPPP with the UPF. All patients were given lysine clonixinate as analgesic medication (500 mg trice a day, on an oral basis) during the first week, as well as a prophylactic antibiotic. Pain levels were measured with a visual analogue scale.

The bed partner of every patient was asked about the presence and/or volume of snoring before and 6 months after the surgical procedure.

The "K point" (the point of greatest traction as the patient says the "K" sound) at the soft palate is marked while the patient is still awake. The patients are placed using the Ross position under the effects of general anesthesia. If possible, the patient is intubated in a nasotracheal fashion. Traditional tonsillectomy is then performed as care is taken not to damage the posterior pillars (Figure 1A). The absence of bleeding is verified, and we proceed to amputate the tip of the uvula with a scalpel,

removing the excess mucosa and exposing the muscle but taking care not to hurt it (Figure 1B). Lateral to the uvula base, a trench is cut in each side, similar to those made in LAUP, making sure to cut just palatal redundant mucosa. The size of the trenches is determined as 50% of the remaining uvula (Figure 1C). A rhombus is then drawn joining the tip of both trenches with the K point, and then its mucosa is carefully removed with a number 15 scalpel (Figure 1D). The excessive mucosa of the posterior pillar is removed, widening the airway. The uvula is then reflected back toward the soft palate, covering the denuded area, with a flap stitch from the uvula tip to the K point with 3-0 chromic catgut, and then the rest of the surgical wound is sutured, and the border of the posterior pillar is joined with the anterior one only in the upper third (Figure 1E).

The mean snoring index was analyzed using the Student *t*-test, using SPSS 11.0 for Windows (SPSS Inc, Chicago, IL).

Results

Thirty-eight male and 12 female patients were studied. Their ages ranged from 18 to 72 years, and all of them were diagnosed as primary snorers with an overnight sleep test. Body mass index ranged from 25 to 29. The preoperative RDI had a mean of 3.7, ranging from 2.3 to 4.9, whereas the preoperative snoring index had a mean of 145.52. All of them had retropalatal collapse. The average surgical time was 45 minutes.

At the sixth postoperative month, 48 patients (96%) said that "the snoring is gone," and only 2 (4%) answered that "snoring is no longer a problem." The postoperative snoring index mean was 36, whereas the Student *t*-test had a *t* value of 12.699 for a *p* < .001, with 95% confidence intervals of 112.98 to 155.45 for the snoring index. Operative bleeding average was 60 mL, and the visual analogue scale for pain (0-10) ranged from 1 to 3 on the first postoperative day, from 2 to 6 on the third one, and from 0 to 1 on the sixth. The mean values are displayed in Figure 2. None of the patients had significant pain after the sixth day.

All of them had mild transient velopharyngeal incompetence during the first 2 or 3 weeks, but it gradually disappeared. No stenotic scars, postoperative bleeding, persistent velopharyngeal incompetence, dysphagia, speech disorders, or other major complications were seen after 1 year of follow-up.

Discussion

This study has some weak points. In the first place, a clinical, controlled, and blind trial is the ideal kind of

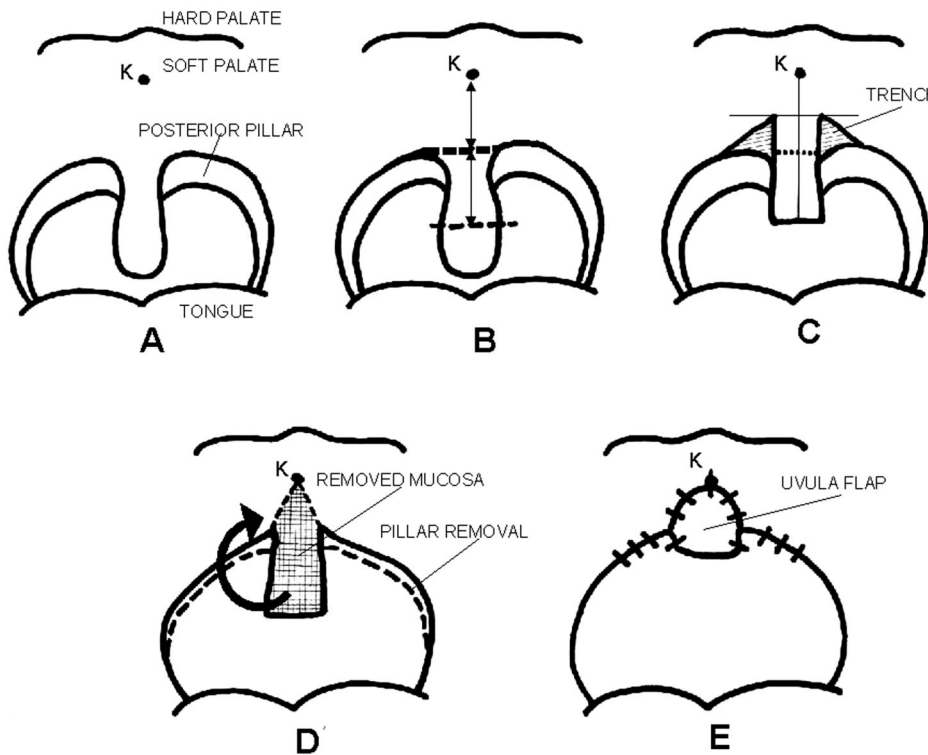


Figure 1. Surgical steps of uvulopalatopharyngoplasty with a uvulopalatal flap. See details in the text.

design to know if any new treatment is effective. However, this is not the aim of the study because we only want to describe a new technique, with a low rate of complications, although successful as a treatment for snoring without sleep apnea in this pilot study. The presence of the Hawthorne effect (subjective improvement owing to the fact of being treated) is, of course, a risk in this study because only snoring and pain were assessed. Further studies in the near future will be mandatory. We have, nevertheless, a statistical test proving that snoring (as a

parametric variable) improved significantly after the procedure.

In this series, we found a high rate of improvement of snoring: it disappeared in 96% of cases and decreased in 4%, so the clinical results are equivalent to those of the traditional UPPP and other modalities of treatment. We had no major complications, neither during the procedure nor in the postoperative period.

Despite all of the cases presenting with velopharyngeal incompetence in the early postoperative period, it did not last beyond the third postoperative week. It is well known that permanent velopharyngeal incompetence is the most common complication of UPPP. However, as we avoid large continuous incisions, making small cuts in different directions, the scar does not tend to be concentric. In the event of permanent incompetence, the uvula flap can be undone in the office under local anesthesia, avoiding the need for general anesthesia to rotate palatal flaps to correct the palatal incompetence. The postoperative pain was fully controlled with oral lysine, and it had its highest peak at the third day. This clearly contrasts to other techniques, such as LAUP, in which significant pain is frequently seen.

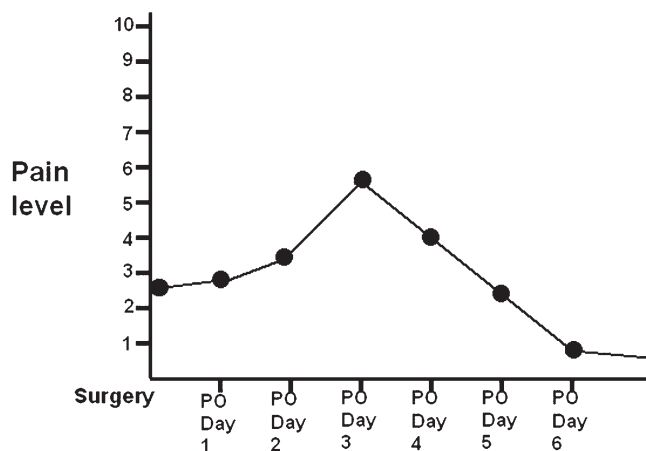


Figure 2. The visual analogue pain scale shows no significant pain on the sixth postoperative (PO) day.

Conclusions

As with every new technique, UPPP used along with a UVP has to be validated. However, it seems to be a

potentially successful procedure in the treatment of sleep-disordered breathing, with the advantage of being reversible in the case of persistent velopharyngeal incompetence. It has been initially proved to treat snoring with good results, but further studies will show if it is useful to treat OSA as well.

The complication rate seems to be low with this procedure while achieving good subjective results regarding snoring. The possibility of correcting velopharyngeal incompetence without too much discomfort and expenses and the not significant postoperative pain are the main advantages of performing this technique because it shows no differences compared with other surgical procedures regarding efficacy.

The real role of this technique is still to be discovered, but we have to keep it in mind as a good tool in the treatment of snoring at this time.

References

1. Palomaki H, Partinen M, Juvela S, et al. Snoring as a risk factor for sleep-related brain infarction. *Stroke* 1989;20:1311-5.
2. Guilleminault C, Connolly SJ, Winkle RA. Cardiac arrhythmia and conduction disturbance during sleep in 400 patients with sleep apnea syndrome. *Am J Cardiol* 1983;52:490-4.
3. Piccirillo JF, Gates GA, White DL, et al. Obstructive sleep apnea treatment outcomes pilot study. *Otolaryngol Head Neck Surg* 1998;118:833-44.
4. Ichioka M, Tojo N, Yoshizawa M, et al. A dental device for the treatment of obstructive sleep apnea: a preliminary study. *Otolaryngol Head Neck Surg* 1991;104:555-8.
5. Scheuller M, Weider D. Bariatric surgery for treatment of sleep apnea syndrome in 15 morbidly obese patients. Long term results. *Otolaryngol Head Neck Surg* 2001;125:299-302.
6. Neruntarat C. Laser-assisted uvulopalatoplasty: short-term and long-term results. *Otolaryngol Head Neck Surg* 2001;124:90-3.
7. Sher AE, Flexon PB, Hillman D, et al. Temperature-controlled radiofrequency tissue volume reduction in the human soft palate. *Otolaryngol Head Neck Surg* 2001;125:312-8.
8. Fujita AS, Conway W, Zorick F, et al. Surgical correction of anatomic abnormalities in obstructive sleep apnea syndrome: uvulopalatopharyngoplasty. *Otolaryngol Head Neck Surg* 1981;89:923-34.
9. Boot H, van Wegen R, Poublon RML, et al. Long-term results of uvulopalatopharyngoplasty for obstructive sleep apnea syndrome. *Laryngoscope* 2000;110:469-75.
10. Riley RW, Powell NB, Guilleminault C. Obstructive sleep apnea syndrome: a review of 306 consecutively treated surgical patients. *Otolaryngol Head Neck Surg* 1993;108:117-25.
11. Fairbanks DNF. Uvulopalatopharyngoplasty complications and avoidance strategies. *Otolaryngol Head Neck Surg* 1990;102:239-45.
12. Riley RW, Powell NB, Guilleminault C, et al. Obstructive sleep apnea surgery: risk management and complications. *Otolaryngol Head Neck Surg* 1997;117:648-52.
13. Powell NB, Riley RW, Guilleminault C, et al. A reversible uvulopalatal flap for snoring and sleep apnea syndrome. *Sleep* 1996;19:593-9.
14. Woodson BT, Naganuma H. Comparison of methods of airway evaluation in obstructive sleep apnea syndrome. *Otolaryngol Head Neck Surg* 1999;120:460-3.
15. Skatvedt O. Localization of site of obstruction in snorers and patients with obstructive sleep apnea syndrome: a comparison of fiberoptic nasopharyngoscopy and pressure measurements. *Acta Otolaryngol (Stockh)* 1993;113:206-9.
16. Terris DJ, Hanasono MM, Liu YC. Reliability of the Muller maneuver and its association with sleep disordered breathing. *Laryngoscope* 2000;110:1819-23.
17. Labra A, Huerta-Delgado A, Alanis-Calderon J, et al. Diagnosis of sleep apnea syndrome. Presented at the annual meeting of the Mexican Society of Otolaryngology; 2002; Puebla.

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