Operative Techniques in Otolaryngology (2007) 18, 7-10

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Operative Techniques in

Otolaryngology

Palatal stiffening after failed uvulopalatopharyngoplasty with the Pillar implant system

Michael Friedman, MD,[a] Paul Schalch, MD[b]

From the [a]Section of Head and Neck Surgery, Department of Otolaryngology and Bronchoesophagology, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois; and the [b]Department of Otolaryngology–Head and Neck Surgery, University of California–Irvine Medical Center, Orange, California.

KEYWORDS
Revision uvulopalatopharyngoplasty;
Uvulopalatopharyngoplasty salvage;
Pillar Implant System;
OSAHS treatment

The Pillar Implant Technique (Restore Medical Inc, St. Paul, MN) for soft palatal stiffening may offer a good alternative for surgical revision of patients who underwent uvulopalatopharyngoplasty for obstructive sleep apnea/hypopnea syndrome (OSAHS), and who have recurrent symptoms like increased daytime sleepiness, snoring, and worsening polysomnographic parameters. The technique is identical to the one previously described for patients with intact soft palates. Due to its low morbidity, this technique is a good option for appropriately selected patients that are unwilling to accept continuous positive airway pressure as a permanent form of management for recurrent OSAHS, or that refuse more aggressive revision surgery. The presence of palatal implants does not in any way affect or complicate subsequent palatal revision procedures in patients who might consider having surgery for persistent OSAHS after the revision Pillar Implant Technique.

Stiffening of the soft palate using the Pillar Palatal Implant System (Restore Medical Inc, St. Paul, MN) is a simple, office-based procedure with minimal morbidity, designed for the treatment of snoring and mild-to-moderate obstructive sleep apnea/hypopnea syndrome (OSAHS). An improvement in snoring, as determined by patients and their bed partners, that ranges between 43% and 88%, has been described by several authors.[1-3] Its effectiveness in reducing the apnea/hypopnea index by 50% or more, to an absolute value <20, ranges from 34% to 47% in appropriately selected patients.[1] This compares favorably to the objective cure rates achieved by uvulopalatopharyngoplasty (UPPP).[4] Results from long-term follow-up after soft palate implant placement indicate that both snoring and OSAHS polysomnographic parameters remain stable, with only a slight tendency toward relapse, which again compares favorably with other techniques that address the soft palate, and with far less morbidity.[2,3]

Address reprint requests and correspondence: Michael Friedman, MD, Department of Otolaryngology and Bronchoesophagology, Rush-Presbyterian-St. Luke's Medical Center, 30 North Michigan Avenue, Suite 1107, Chicago, IL 60602.

E-mail address: hednnek@aol.com.

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doi:10.1016/j.otot.2007.01.001

UPPP is the single most common surgical procedure performed for the correction of retro-palatal obstruction causing or contributing to OSAHS. Many studies, however, still show considerable failure rates. Causes of persistent obstruction range from morbid obesity with pan-airway obstruction, to inadequate palatal resection with a variable amount of remaining soft palate, in variable positions.[5] Several authors[5,6] have extensively studied the implication of the retro-palatal space in UPPP failure. Up to 75% of patients exhibit persistent obstruction localized to the level of the palate after manometric analysis of the retro-palatal airway. In fact, sleep endoscopic studies have shown that in 50% of patients, persistent obstruction is not attributable to airway collapse at the base of the tongue after having undergone unsuccessful UPPP but to persistent retro-palatal obstruction. In our practice, we have found that a significant number of patients are treated with a form of minimal or conservative UPPP, for a variety of reasons. These patients may present with persistent OSAHS due to a long segment of palate that causes persistent obstruction.

The Pillar Implant Technique (PIT) for soft palatal stiffening may offer a good alternative for surgical revision of patients who underwent UPPP for OSAHS, and who have recurrent symptoms like increased daytime sleepiness, snor-

ing, and worsening polysomnographic parameters. Due to its low morbidity, this technique is a good option for appropriately selected patients seeking surgical treatment due to unwillingness to accept continuous positive airway pressure as a permanent form of management for recurrent OSAHS. The PIT might be a good first attempt to correct persistent retro-palatal obstruction, before attempting more aggressive revision surgery.[7]

Patient selection

All patients considered candidates for Pillar Implant revision after UPPP should undergo a full otolaryngologic examination, including fiberoptic nasopharyngoscopy, and in select cases, sleep endoscopy. Patients should be offered this treatment alternative if they have a history of OSAHS initially treated with UPPP, with recurrence of snoring with or without daytime sleepiness symptoms. The best candidates are those diagnosed with mild (apnea-hypopnea index [AHI] $\geq$5 and $\leq$15) or moderate (AHI 16-40) OSAHS on polysomnography at the time of recurrence of symptoms. Patients should demonstrate evidence of persistent retro-palatal obstruction based on physical examination, Mueller maneuver, and sleep endoscopy as a cause for recurrent symptoms. A residual soft palatal segment $\geq$2 cm (Figure 1) is required because the implants themselves are 1.8-cm long.

Patients that have evidence of nasopharyngeal stenosis, severe OSAHS (AHI $\geq$40), or persistent tongue base obstruction contributing to OSAHS are probably not adequate candidates for this revision strategy (Figure 2).

Surgical technique

The surgical technique for Pillar implant placement in post-UPPP patients is identical to the conventional technique in regular patients.[1] Care must be taken to perform an adequate measurement of the residual palate before selecting appropriate candidates to ensure a minimum length of 2 cm. The oral cavity is prepared with chlorhexidine gluconate rinse. Implantation sites are marked just in front of the soft palate/hard palate junction (midline and 2-3 mm laterally, on each side). The exact location of the insertion site is determined by palpating the junction of the soft and hard palate with the index finger. A mixture of 1% lidocaine HCL with epinephrine 1:100,000 is injected into each of the marked sites. The device needle is inserted into the soft palate at the midline marking first, while the angle and depth are estimated with the index finger of the free hand. The needle is advanced until the full insertion depth marker (which should remain visible), thus creating a tunnel in the soft palate muscles, into which the implant is then deployed. The device is unlocked by pressing the lock located beneath the slider downwards. The slider is pushed halfway, until a click is heard. The needle is then withdrawn until the halfway depth marker, and the slider is pushed all the way in, thus deploying the implant into the residual soft palate. In the same fashion, the 2 lateral implants are inserted on each side of the midline (Figure 3).

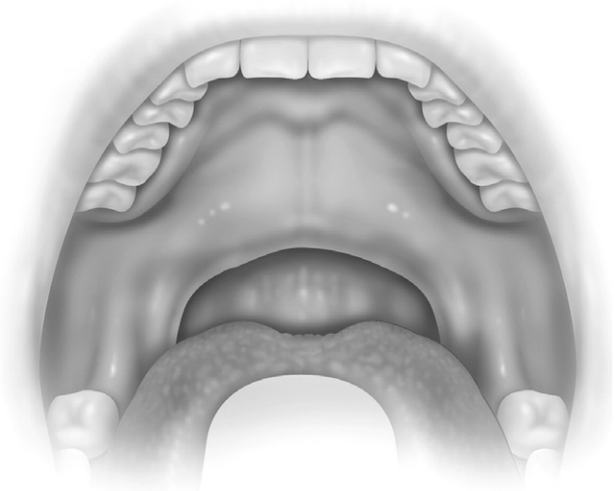

Figure 1 Post-UPPP palate. Adequate candidate for a revision PIT due to soft-palatal segment >2 cm, adequate retro-palatal space, and absence of nasopharyngeal stenosis.

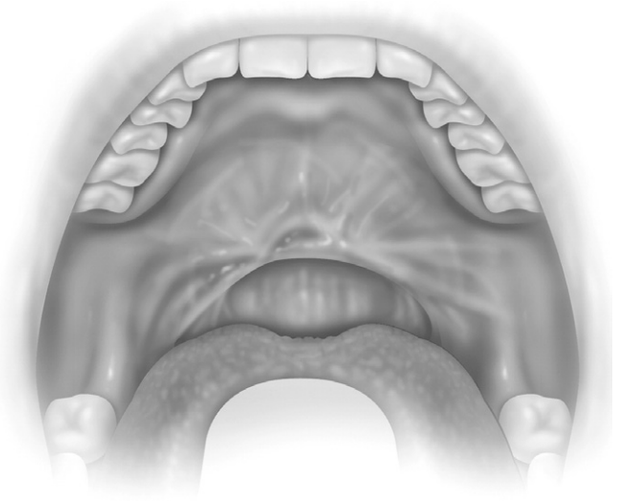

Figure 2 Post-UPPP palate with nasopharyngeal stenosis secondary to scarring. Not an ideal candidate for a revision PIT.

Postoperative management and complications

A 5-day course of antibiotics was given to all patients postoperatively. As the local anesthesia wears off, most patients report adequate postoperative pain control with over-the-counter acetaminophen. Alternatively, patients can be prescribed acetaminophen with codeine or hydrocodone for a couple of days.

Potential complications of Pillar implantation include extrusion or infection. In a recent series of 26 patients that underwent the PIT for recurrent OSAHS after UPPP, we did not observe any complications in any of the patients participating in this study. No patient reported dysphagia, and pain levels postoperatively ranged from 3 to 6/10 during the

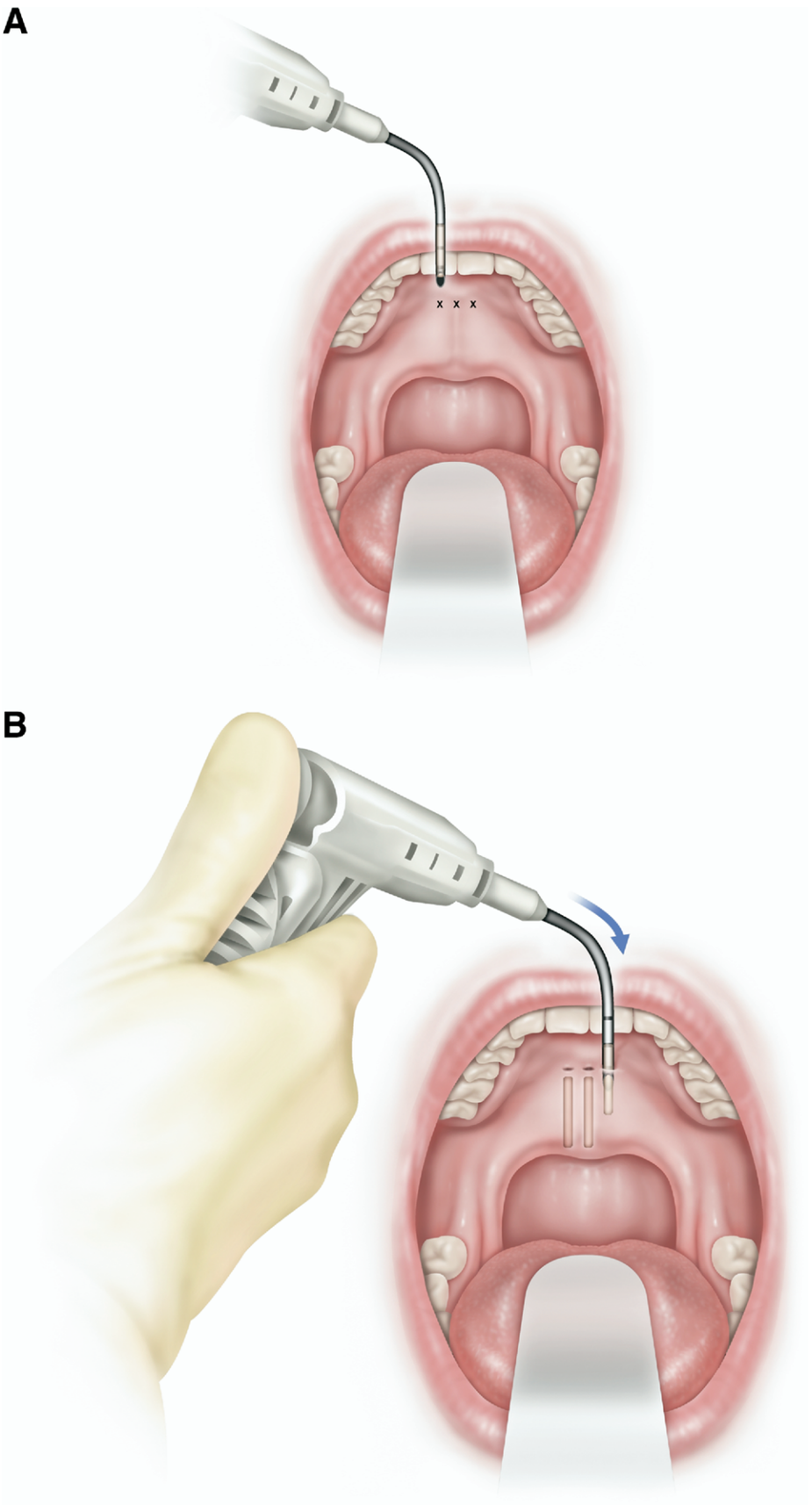

Figure 3 PIT in post-UPPP palate. (A) The insertion sites at the soft palate-hard palate junction are marked 2-mm apart from each other. (B) Implants are inserted with the delivery system at the midline and on each side of the midline.

first 24 hours after the procedure. Patients required over-the-counter oral analgesics for up to 48 hours in all cases, and all patients were able to immediately resume normal levels of activity and a regular diet.[8]

Success rate of the procedure

There was an overall subjective improvement in 73.9% of 26 patients that underwent the PIT after UPPP. Likewise, Quality of Life scores demonstrated significant improvements in all but most domains, thus confirming the effectiveness of the PIT in achieving subjective improvement in patients with recurrence of symptoms (mainly snoring) after UPPP.[8] Results, however, indicate that objective cure was only achieved in 21.7% of patients undergoing the procedure,[8] which compares unfavorably to the objective success rates of other UPPP-revision procedures, like Z-palatoplasty (67.7%)[7] or transpalatal advancement pharyngoplasty (67%).[9]

The PIT may have a role as an alternative procedure that addresses recurrent symptoms in patients refusing more aggressive surgery. This is especially important in patients whose only symptom is snoring. The advantages are the low morbidity and the fact that the presence of palatal implants does not in any way affect or complicate subsequent palatal surgery or revision procedures in patients who might consider them in light of persistent OSAHS after the PIT. Often, UPPP can be performed without disturbing the previously placed implants, since the residual soft-palatal segment is usually longer than 2 cm. Its effectiveness in achieving an objective cure is, however, limited.

Conclusions

The PIT is an effective means for achieving subjective improvement of recurrent or persistent symptoms of snoring, daytime sleepiness, and overall quality-of-life perception in post-UPPP patients. It has a limited efficacy in attaining an objective cure. The PIT can be performed with the same ease as in patients who have not undergone any previous surgical procedure. Due to the safety and low morbidity associated with the procedure, the PIT may be offered as a reasonable alternative to improve symptoms in patients not willing to accept continuous positive airway pressure as a permanent form of management, and who also refuse more aggressive revision surgery.

References

1. Friedman M, Vidyasagar R, Bliznikas D, et al: Patient selection and efficacy of Pillar implant technique for the treatment of snoring and obstructive sleep apnea/hypopnea syndrome. Otolaryngol Head Neck Surg 134:187-196, 2006
2. Maurer JT, Hein G, Verse T, et al: Long-term results of palatal implants for primary snoring. Otolaryngol Head Neck Surg 133:573-578, 2005
3. Norgard S, Stene BK, Skjostad KW, et al: Palatal implants for the treatment of snoring: Long-term results. Otolaryngol Head Neck Surg 134:558-564, 2006
4. Sher AE, Schechtman KB, Piccirillo JF: The efficacy of surgical modifications of the upper airway in adults with obstructive sleep apnea syndrome. Sleep 19:156-177, 1996
5. Metes A, Hoffstein V, Mateika S, et al: Site of airway obstruction in patients with obstructive sleep apnea before and after uvulopalatopharyngoplasty. Laryngoscope 101:1102-1108, 1991
6. Woodson BT, Wooten MR: Manometric and endoscopic localization of airway obstruction after uvulopalatopharyngoplasty. Otolaryngol Head Neck Surg 111:38-43, 1994
7. Friedman M, Duggal P, Joseph NJ: Revision uvulopalatoplasty by Z-palatoplasty. Otolaryngol Head Neck Surg 2007 (in press)
8. Friedman M, Schalch P, Joseph NJ: Palatal stiffening after failed uvulopalatopharyngoplasty with the Pillar Implant System. Laryngoscope 116:1956-1961, 2006
9. Woodson BT, Toohill RJ: Transpalatal advancement pharyngoplasty for obstructive sleep apnea. Laryngoscope 103:269-276, 1993