PASS Palatal Advancement and Suspension Suture Technique: A Novel, Minimally Invasive Uvulopalatopharyngoplasty Technique for Sleep Apnea

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ABSTRACT

Objectives: To develop a minimally invasive surgical technique to treat the palatal component of OSA. To perform a pilot trial to determine feasibility.

Study Design: Prospective, non-randomized clinical trial.

Methods: Twenty-eight patients were studied. The PASS technique was used to treat the palatal component of obstruction in multilevel surgery for OSA (mild-severe).

Results: The PASS technique proved to be a consistently reliable method to advance and suspend the palate without palatal mucosal excision to correct the palatal component of OSA.

Conclusions: The results of the pilot study demonstrated that the PASS technique was a functionally and anatomically based non-destructive treatment for palatal obstruction to treat apnea.

INTRODUCTION

Surgical correction of obstructive sleep apnea syndrome (OSAS) can be challenging. Complicating surgical correction of OSAS is the multifactorial (anatomy, obesity) and the multi-level anatomic components to the disease (nasal, oropharyngeal, hypopharyngeal).

In the pursuit of treating the palatal component of OSAS, Fujita first described the uvulopalatopharyngoplasty in 1981. Since then, various modifications of the palatoplasty have been proposed. Friedman later described a Z-palatoplasty used primarily for patients who had a previous tonsillectomy.

Further, minimally invasive techniques to address the palate have been proposed. Palatal stiffening procedures for snoring and mild sleep apnea such as injection snoreplasty, cautery assisted palatal stiffening (CAPSO), radiofrequency ablation, and Pillar® implantation have been described and promoted.

The ideal palatal procedure for the treatment of the palatal component of OSAS should: 1) be effective; 2) minimize complications; 3) be anatomically based; 4) be non-destructive; 5) provide consistent results.

The PASS (Palatal Advancement and Suspension Suture Technique) was developed to meet the above goals.

METHODS AND MATERIALS

Study Design: Prospective, non-randomized clinical trial.

Methods: 28 patients were studied. The PASS technique was used to treat the palatal component of obstruction in multilevel surgery for OSA (mild-severe). The distance from the free edge of the palate to the posterior pharyngeal wall was measured at the level of the arches (bilateral) of the palate prior to PASS. Three permanent (ethibond®), submucosal, periosteal based sutures were then placed: bilaterally from each hamulus to the ipsilateral palatalpharyngeus muscle within the posterior tonsillar pillar and one to two submucosal sutures where then passed from the hamulus to midline or from the junction of the hard and soft palate in the midline. Gentle retraction resulted in advancement of the palate. An elongated uvula was truncated but all patients had intact uvular tissue at the completion of the surgery.

If combined with tonsillectomy, the palatopharyngeus muscle was identified within the posterior tonsillar pillar of the surgical bed. If prior tonsillectomy had been performed (figure 1) an incision was made in the posterior tonsillar pillar to identify and imbricate the muscle prior to suspension.

RESULTS

Twenty-eight patients were treated with the PASS procedure to treat the palatal component for the surgical treatment of multi-level OSAS.

The average advancement of the right and left palatal arches were 1.13 cm and 1.03 cm, respectively. The average total advancement was 1.0 cm.

There were no complications of VPI in any patient. During the initial use of the procedure, CV-3 Gore® suture was used and later ethibond® suture was used. Because of the narrow width of the palate in the region of the hamulus, suturer/knot extrusion was the most frequent complication occurring in 25% of the patients. Removal or trimming of the exposed suture in clinic resolved this. 10% experienced infection of the wound site which resolved after antibiotics.

REFERENCES


DISCUSSION

The pursuit of the perfect palatal procedure for snoring and OSAS remains elusive. Pang and Woodson have significantly advanced innovative palatal procedures with the lateral pharyngoplasty and palatal advancement. J. Hur describes a “sling snoreplasty” in which a permanent (4.0 nylon) is used in the clinical setting to address snoring.

The Palatal Advancement and Suspension Suture Technique (PASS) is a realization that a lateral sphincter pharyngoplasty and the palatal advancement are anatomic based procedures. Further, the PASS attempts to incorporate the minimally invasive concepts of the sling snoreplasty with a more robust suture material. The PASS procedure lateralizes the soft tissue of the lateral pharyngeal wall (compare fig. 1 & 4) by localizing and plicating the palatopharyngeus muscle. During the PASS procedure, the free edge of the palate is objectively elevated and suspended (chart 1) in a non-ablative manner. The uvular tissue is largely left intact. With the mucosal arches, uvula, and palatal muscles left intact, velopharyngeal insufficiency is completely eliminated as a possible complication.

CONCLUSIONS

Conclusions: The results of this pilot study demonstrated that the PASS technique was a functionally and anatomically based non-destructive treatment for palatal obstruction to treat apnea. The limitations of the following study are the limited numbers of patients; the lack of a control arm with the gold standard UPPP; and the lack of isolating the PASS as a single treatment for palatal only OSA. The complications were minor and were primarily suture extrusion and infection of the suture material.