



INFEROLATERAL PHARYNGOPLASTY

Hasan Tanyeri,MD; Gediz Murat Serin,MD; Elif Ayanoglu Aksoy,MD; Senol Polat, MD; Ömer Faruk Ünal,MD

Acibadem University, School Of Medicine, Department of Otolaryngology Head and Neck Surgery

ABSTRACT

Objectives: This study describes inferolateral pharyngoplasty (ILP) and its effectiveness as a surgical technique to enlarge pharyngeal air space inferolaterally which compliments submucosal uvulopalatopharyngoplasty (smUPPP) in the treatment of obstructive sleep apnea (OSA).

Methods: 36 patients underwent complete tonsillectomy including lingual portions of palatine tonsils during smUPPP. Reconstruction included double layer closure, muscle and mucosa emphasizing inferolateral portions of smUPPP. Pre and postoperative Muller maneuver were analyzed.

Results: The study group consisted of 34 males (94.4%) and 2 females (5.6%). The mean age was 37±9.5. The pharyngeal collapse during MM in the preoperative subjects is 2.61 and standart deviation is 0.8. The pharyngeal collapse during MM in the postoperative subjects is 1.31 and standart deviation is 0.7. The score of collapse significantly decreased in postoperative patients (p<0.0005)

Conclusions: ILP is a complimentary procedure to smUPPP which might increase the effectivity of the procedure. This effect might originate from double layer closure in particular emphasis on inferolateral portions. We propose that smUPPP in conjunction with ILP is an effective procedure to ameliorate OSA condition.

Key words: Obstructive Sleep Apnea; Snoring; Pharyngoplasty.

CONTACT

Hasan Tanyeri, MD, Prof.
Acibadem University, Department of Otolaryngology, Maslak Hospital
Email: hasan@tanyerikbb.com
Phone: +90 532 7074100

INTRODUCTION

Obstructive sleep apnea (OSA) is occurring by the partial or total collapse of the soft tissues at any level through the entire upper airway. Collapse of the upper airway is usually multilevel, at the level of the soft palate, the base of tongue, and the lateral pharyngeal walls. Lateral pharyngeal wall collapse has been demonstrated to be important in the pathogenesis of OSA and it plays a significant role in the pathogenesis of OSA.^{1,2}

There have been numerous surgical procedures for the treatment of OSA and each procedure has its limitations and disadvantages. Uvulopalatopharyngoplasty (UPPP) is the commonest surgical procedure performed for patients with OSA with predominantly retropalatal collapse.^{3,4} UPPP procedures has many modifications and the success rate for UPPP in unselected cases was about 50% only.^{4,6}

Inferolateral pharyngoplasty (ILP) is a complimentary procedure to submucosal UPPP (smUPPP) which might increase the effectivity of the surgery. Reconstruction included double layer closure, muscle and mucosa emphasizing inferolateral portions of smUPPP. We aimed to observe the changes in the inferolateral pharyngeal airway utilizing fiberoptic laryngoscopy (FOL) with Muller's maneuver (MM) after surgeries.

METHODS AND MATERIALS

Thirty-six patients with OSA who underwent smUPPP with ILP between January 2010 and May 2012 were enrolled in the study. Surgeries were done by the same otolaryngologist (HT). Patients underwent an otolaryngological clinical examination, FOL with MM and an overnight attended polysomnogram preoperatively. All patients underwent smUPPP as described by Friedman et al⁴ complemented with ILP.

All the procedures were performed while the patient was under general anesthesia with orally endotracheal intubation. Patients had their heads extended and a mouth gag was used to adequately expose the oropharynx. SmUPPP's were done as described by Friedman et al.⁷ The palatoglossus, palatopharyngeus, and superior pharyngeal constrictor muscles were easily identified following the UPPP. Additional attention was paid to the inferolateral parts of each tonsillar fossa. The flap edges were closed in two layers (muscle and mucosa) with absorbable sutures. Palatopharyngeous muscle and the superior pharyngeal constrictor muscles were grasped and sutured laterally to the ipsilateral palatoglossus muscle with 3-0 polyglactin (Vicryl Rapid, Ethicon GmbH) (Figure 1). Mucosal edges were approximated with 3.0 polyglactin to the base of the tongue consecutively (Figure 2).

RESULTS

Thirty-six patients underwent smUPPP with ILP. There were 34 (94.4%) male and 2 (5.6%) female. The mean age was 37 years. The mean score of inferolateral pharyngeal wall collapse observed during MM in the preoperative subjects is 2.61 and standart deviation is 0.8. The mean score of inferolateral pharyngeal wall collapse observed during MM in the postoperative subjects is 1.31 and standart deviation is 0.7. The score of collapse significantly decreased in postoperative patients (p<0.0005). Figure 3 and 4 shows a demonstration of a representative patient with the inferolateral pharyngeal airway collapse during MM pre and postoperatively.

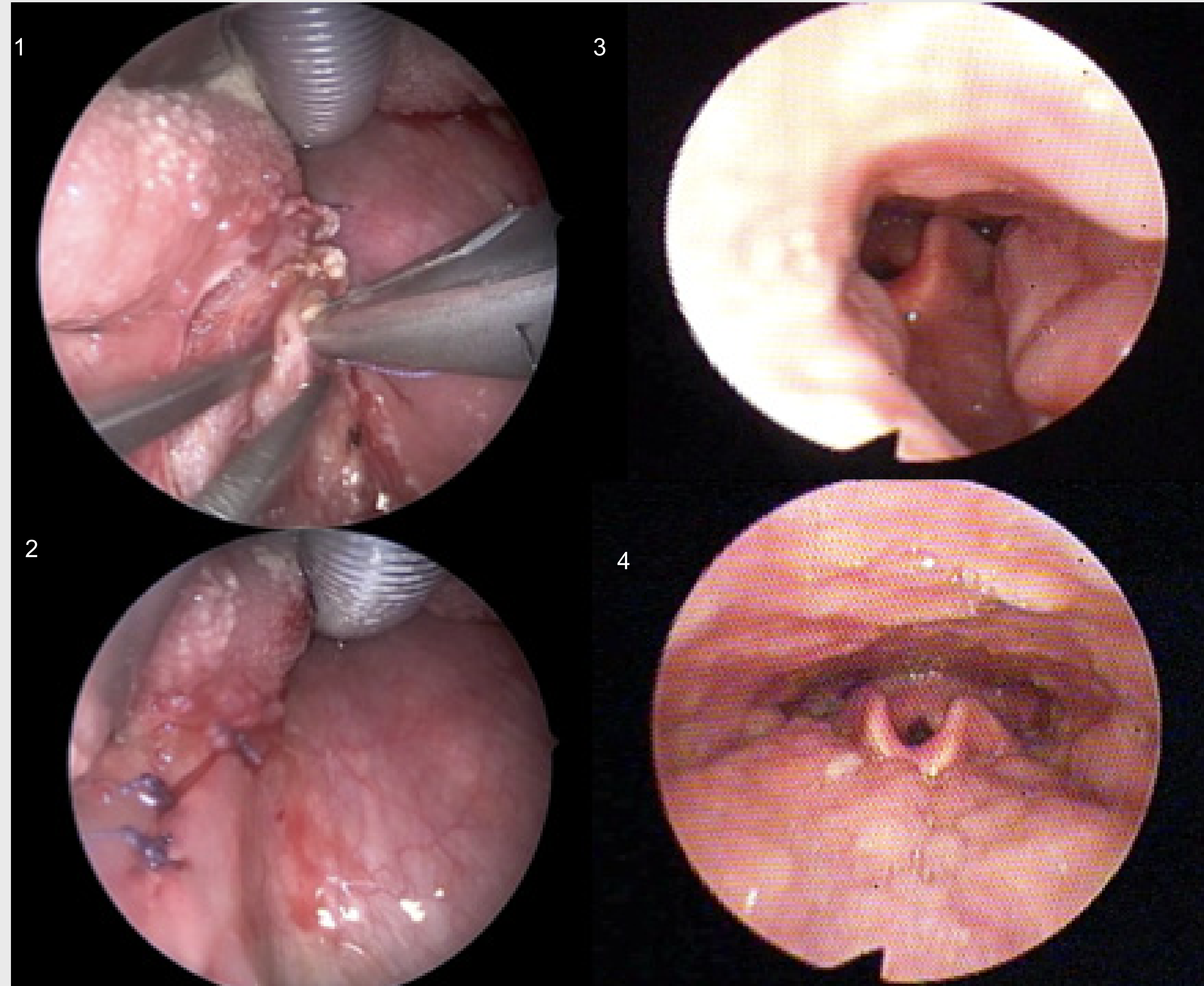


FIGURE LEGENDS

Figure 1: Palatopharyngeous muscle and the superior pharyngeal constrictor muscles were grasped and sutured laterally to the ipsilateral palatoglossus muscle with 3-0 polyglactin

Figure 2: Mucosal edges were approximated with 3.0 polyglactin to the base of the tongue consecutively

Figure 3 and 4: Representative pictures of the same patient pre and postoperatively during FOL

DISCUSSION

Uvulopalatopharyngoplasty is the commonest surgical procedure performed for patients with OSA with pre-dominantly retropalatal collapse.⁹ The success rate for UPPP in unselected cases was about 40% only.¹⁰ Limited effectiveness is probably due to multilevel pathogenesis of OSA, inadequate airway diagnosis preoperatively or failure of surgical technique. Therefore, optimal surgical therapy directed at specific sites of obstruction can increase surgical success rates.

Endoscopic examination with Muller's maneuver demonstrates upper airway collapse at the levels of the palate, base of tongue and the lateral pharyngeal wall (LPW).¹¹ LPW is a complex structure composed of numerous pharyngeal muscle groups, in addition to lymphoid tissue (palatine tonsils). The role of the LPW in the pathogenesis of OSA has been demonstrated by Schwab et al.¹² Surgical procedures to alter the LPW can be approached by direct splinting of the LPW by sewing the superior pharyngeal constrictor muscle. The lateral pharyngoplasty, first described by Cahali, was aimed at addressing the LPW collapse in patients with OSA.¹³ Lateral pharyngoplasty procedure has many modifications and they all showed promising results.

The MM was first described by Borowiecki and Sassin for the preoperative assessment of OSA.¹¹ The MM consists of having the patient perform a forced inspiratory effort against an obstructed airway with fiberoptic endoscopic visualization of the upper airway to imitate collapse during sleep. The data from this small retrospective series of 36 patients suggest that the ILP may offer benefits to the collapsed inferolateral pharyngeal wall in addition to smUPPP.

CONCLUSIONS

Inferolateral pharyngoplasty complimenting smUPPP is a choice of surgical treatment and the efficacy of this procedure increases when patients are selected properly. This effect might originate from double layer closure in particular emphasis on inferolateral portions. We propose that smUPPP in conjunction with ILP is an effective procedure to ameliorate OSA condition.

REFERENCES

Cahali MB. Lateral pharyngoplasty: a new treatment for OSAHS. Laryngoscope 2003;113:1961-8.
Pang KP, Woodson BT. Expansion sphincter pharyngoplasty: a new technique for the treatment of obstructive sleep apnea. Otolaryngol Head Neck Surg. 2007 Jul;137(1):110-4.
Fujita S, Conway W, Zorick F, et al. Surgical correction of anatomic abnormalities in obstructive sleep apnea syndrome: uvulopalatopharyngoplasty. Otolaryngol Head Neck Surg 1991;89:923-34.
Friedman M, Schaich P. Surgery of the palate and oropharynx. Otolaryngol Clin North Am. 2007 Aug;40(4):829-43. Review.
FriedmanM, Vidyasagar R, Bizziakas D, et al. Does severity of obstructive sleep apnea/hypopnea syndrome predict uvulopalatopharyngoplasty outcome? Laryngoscope 2005; 115: 2109-13.
FriedmanM, Ibrahim H, Joseph N. Staging of obstructive sleep apnea/hypopnea syndrome: a guide to appropriate treatment. Laryngoscope 2004;114:454-9.
Friedman M, Landsberg R, Tanyeri H. Submucosal uvulopalatopharyngoplasty. Op Tech Otolaryngol Head Neck Surg 2000;11:26-9.
Terra DJ, Hansson MM, Liu YC. Reliability of the Muller maneuver and its association with sleep-disordered breathing. Laryngoscope 2000; 110:1819 -23.
Shepard J.W. & Olsen K.D. (1990) Uvulopalatopharyngoplasty for the treatment of obstructive sleep apnea. Mayo Clin. Proc. 65, 1260-1267.
Sher A.E., Schechtman K.B. & Piccirillo J.F. (1996) The efficacy of surgical modifications of the upper airway in adults with obstructive sleep apnea syndrome. Sleep 19, 156-177.
Borowiecki BD, Sassin JF. Surgical treatment of sleep apnea. Arch Otolaryngol 1983;109:506-12.
Schwab RJ, Getler WB, Hoffman EA, et al. Dynamic upper airway imaging during awake respiration in normal sub- jects and patients with sleep-disordered breathing. Am Rev Respir Dis 1993;148:1385-1400.
Cahali MB. Lateral pharyngoplasty: a new treatment for OSAHS. La- ryngoscope 2003;113:1961-8.