ABSTRACT

OBJECTIVE:
1. Discuss the theory of multilevel sleep surgery for obstructive sleep apnea (OSA) management
2. Evaluate the outcomes of lateral pharyngoplasty and midline glossectomy

SUBJECTS AND METHODS: Retrospective chart review of adult patients with polysomnographic evidence of OSA treated at a tertiary care center with multilevel surgery involving lateral pharyngoplasty and midline glossectomy between 2009 and 2010. Outcome measures included change in preoperative and postoperative AHI, RDI, and oxygen nadir. Statistical analysis performed using student’s t-test and Wilcoxon rank test.

RESULTS: Thirty-three patients were identified that met inclusion criteria. The mean preoperative BMI was 30.4, and postoperative BMI was 29.1 (P=0.058). The mean decrease in AHI was 14.5 from 34.1 to 19.60 (P=0.016). The mean decrease in RDI was 17 from 38.7 to 21.7 (P=0.021). The mean improvement in oxygen nadir was 22% from 64.3 to 86.42 (P=0.013).

CONCLUSIONS: Multilevel sleep surgery results in a statistically significant improvement in polysomnographic metrics, such as AHI and RDI, for obstructive sleep apnea.

INTRODUCTION

In patients intolerant of CPAP, multilevel sleep apnea surgery is a therapeutic option. OSA is usually caused by multilevel obstruction, and surgical treatment has evolved to target each of these areas. Multilevel sleep apnea surgery has been shown to be successful in two-thirds of treated patients demonstrating significant improvement in the severity of sleep apnea. Lateral pharyngoplasty is a modification of other pharyngeal expansion procedures, which has proven successful in resolving lateral pharyngeal collapse. Midline glossectomy is a proven, effective surgical modality for OSA patients with significant macroglossia.

METHODS

• Retrospective chart review from 2009 to 2010
• Tertiary care referral center
• Inclusion Criteria:
  • Polysomnographic evidence of OSA
  • Failed CPAP
  • Multilevel surgery involving above techniques
• Statistics: student’s t-test and Wilcoxon rank
• Significance set at p < 0.05

LATERAL PHARYNGOPLASTY

After the tonsillectomy, vertical incisions are made on both extremes of the lateral soft palate. This full thickness palate cut beginning inferiorly, but the anterior surface has a minimal cut and the posterior surface has a high (superior) cut. This leaves the soft palate hinged superiorly. With the palatopharyngeus cut, we advanced the soft palate anteriorly and laterally by using horizontal mattress sutures (from posterior soft palate to the area near maxillary tuberosity) and other supporting sutures. The anterior and posterior tonsillar pillars are sutured, closing the tonsillar fossa. A view of the velopharynx from below with a 70 degree scope before and after the lateral pharyngoplasty reveals immediate AP advancement to about 1 cm and a lateral expansion of over a 1 cm.

MIDLINE GLOSSECTOMY

A 70 degree endoscope is used to visualize the base of tongue. The Coblator® (Arthrocare Corp, Austin, Tx, USA) is set on coblate 9 and cauterize 3. Coblate is used for the entire dissection which starts 1 cm anterior to the circumvallate papillae and continues posteriorly to the midline glossoepiglottic fold (vallecula near mid-epiglottis). During the dissection, stay sutures are used to pull the tongue anteriorly and laterally, which advances and splays open the midline tongue base for dissection. Lateral dissection is always within 1 cm from the midline, and continues to a depth of about 1.5 cm. No sutures are used to close the wound, thus preventing hematoma or collection.

RESULTS

• Thirty three patients met inclusion criteria
• 26 male; 7 female
• Mean Age: 42.4 years (22 - 65)
• Mean BMI: Preop 30.32 ; Postop 29.06
• Presenting symptoms
  • Snoring: 33/36 (92%)
  • Daytime somnolence: 26/33 (79%)
  • Hypertension: 14/33 (42%)
  • Nighttime arousal: 23/33 (70%)
• Procedures Performed
  • Septum: 20 (61%)
  • Turbinate Reduction: 25 (76%)
  • Tonsil: 25 (76%)
  • Adenoid: 4 (12%)
  • Pharyngoplasty: 31 (94%)
  • Glossectomy: 24 (73%)
  • Hyoid Suspension: 15 (45%)

<table>
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<th>Metric</th>
<th>PreOp</th>
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<td>BMI</td>
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<td>AHI</td>
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<td>Oxygen Nadir</td>
<td>64.30</td>
<td>86.42</td>
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CONCLUSION

• OSA is a significant health hazard
• Multilevel surgery results in statistically significant improvements in PSG metrics, including AHI, RDI, and oxygen nadir
• There was a decrease in BMI (30.37 ➔ 29.13) that approaches statistical significance
• Further research is necessary to define effective techniques for managing OSA