2017

Radiofrequency ablation of the lateral palatal space for snoring

B T. Woodson
Medical College Of Wisconsin

Kent S. Tadokoro
Medical College Of Wisconsin

Stuart MacKay
University of Wollongong, stuartma@uow.edu.au

Publication Details
Radiofrequency ablation of the lateral palatal space for snoring

Abstract
Objective Pilot study to examine the effect of radiofrequency ablation (RFA) of the lateral palatal fat pad in patients with socially-disruptive snoring. Method Snoring outcomes and complications were compared between a group of patients with treated with RFA ablation of the lateral soft palate fat pad with or without inferior turbinate reduction (8 patients) and another group undergoing inferior turbinate reduction alone (12 patients). Results Snoring loudness and bothersomeness improved in the palate but not inferior turbinate group. Pain was mild and no major complications were observed. Conclusion The study supports RFA ablation of the lateral palatal space as a potential low morbidity procedure for snoring.

Keywords
radiofrequency, space, palatal, lateral, ablation, snoring

Publication Details
Research Paper

Radiofrequency ablation of the lateral palatal space for snoring

B. Tucker Woodson a,*, Kent S. Tadokoro a, Stuart G. MacKay b

a Department of Otolaryngology Division of Sleep Medicine and Sleep Surgery, Medical College Wisconsin, Milwaukee, WI, USA
b Division of Otolaryngology, Head and Neck Surgery, University of Wollongong, Wollongong, NSW, Australia

Received 12 April 2017
Available online 23 June 2017

KEYWORDS
Snoring; Radiofrequency; Somnoplasty; Radiofrequency ablation; Inferior turbinate reduction; Turbinoplasty

Abstract Objective: Pilot study to examine the effect of radiofrequency ablation (RFA) of the lateral palatal fat pad in patients with socially-disruptive snoring.

Method: Snoring outcomes and complications were compared between a group of patients with treated with RFA ablation of the lateral soft palate fat pad with or without inferior turbinate reduction (8 patients) and another group undergoing inferior turbinate reduction alone (12 patients).

Results: Snoring loudness and bothersomeness improved in the palate but not inferior turbinate group. Pain was mild and no major complications were observed.

Conclusion: The study supports RFA ablation of the lateral palatal space as a potential low morbidity procedure for snoring.

Introduction

Snoring is a common nuisance affecting almost half of males and a third of females between 30 and 60 years of age.1 It results from increased upper airway resistance and airway flutter during sleep. Progression may lead to obstructive sleep apnea (OSA). Snoring’s bothersomeness often leads sufferers to seek treatment. Treatments include weight loss, smoking/alcohol cessation, positional therapy, and oropharyngeal exercises. Use of mandibular advancement devices, nasal devices, and continuous positive airway
pressure (CPAP) are other mechanical alternatives. Multiple surgical procedures have also been proposed.

The present study introduces a novel technique that aims to ablate a fat pad in the lateral palate (supratonsillar fat) using radiofrequency ablation (RFA) to decrease snoring. This contrasts to RFA of the midline muscular palate initially described by Powell et al. and others which although reduces snoring with low serious adverse effects, requires multiple treatments with variable outcomes. While the current technique is conceptually similar, it differs in being directed towards a lateral anatomic space containing "supratonsillar fat".

Anatomy

The lateral palatal space is bounded medially by the curving fibres of palatopharyngeus, laterally by the superior constrictor muscle, inferiorly by the superior pole of the tonsil, medially and ventrally by the palatoglossus muscle, and ventrally by the mucosa of the palate (Figs. 1 and 2). The space is somewhat pyramidal in shape, wider and deeper inferiorly near the tonsil, and tapering superiorly towards the hamulus. The space contains a variable amount of fat, the removal of which exposes the boundary structures and opens the area to make it amenable to various surgical techniques. To our knowledge, and upon review of literature and anatomy texts, this space has not previously been described, nor has its surgical importance clearly outlined. It is however, a critical space and outcomes from palatal surgery that are reconstructive/repositioning by nature are influenced by awareness of this key surgical anatomy.

Methods

Study design

Following approval by the IRB of the Medical College of Wisconsin, a retrospective chart review of RFA office based snoring surgeries was performed. RFA aimed at the lateral palatal space \( (n = 8) \) was performed with Coblation (Arthrocare, Smith Nephew, Austin TX). Six of these had simultaneous treatment of the inferior turbinates. Twelve patients with only inferior turbinate reduction were used as a comparison group. Pre-operative and post-operative Epworth sleepiness scale, NOSE, snoring loudness and bothersomeness (10 point visual analog) scales were assessed.

Procedure

Following lidocaine with epinephrine 1% injection into the area of the lateral palatal space, the RF probe was inserted near the tip of the hamulus into the region of the lateral palatal space. Device activation often created an audible crackling/popping noise indicating correct placement.
which indicated ablation of fat instead of muscle. Three or four lesions were then repeated in the area. Amoxicillin (1 g) and prednisone 10–20 mg were given peri-operatively. Pain was controlled with acetaminophen and popsicles; no pain medication was prescribed.

Statistical analysis

Outcomes were analyzed using two way paired t-tests for within subjects and an analysis of variance for comparisons between groups. Statistical significance was a P value less than 0.05.

Results

Patients who received RFA of the lateral palatal space had significant reduction in snoring loudness and bothersomeness (4.5 ± 2.9 and 3.6 ± 2.4 units respectively, Table 1 and Fig. 3). No changes in NOSE scale or Epworth sleepiness scores were observed. Patients who received only inferior turbinate RF ablation did not have a significant improvement in snoring loudness or bother (0.3 ± 1.7 and 0.0 ± 2.0 units respectively). There were no reported complications.

Discussion

This study introduces a modified surgical procedure for snoring and a description of relevant palatal anatomy. Radiofrequency ablation of the lateral palatal space has the goal of reducing the volume of the supratonsillar fat and altering the structure and or compliance of the adjoining structures. Removal of the fat during traditional palatopharyngoplasty is thought to alter the lateral pharyngeal wall, and RF ablation may provide a less invasive alternative to modify this tissue.

The anatomy of the region is significant in that the boundaries of the space describe many of the muscles and tissues that are involved in various reconstructive palatopharyngoplasty techniques for sleep apnea. The palatopharyngeus, palatoglossus, and superior constrictor muscles may be directly modified in this space.

The muscular plane between the palatopharyngeus and constrictor muscles is crossed by the levator palatine muscle superiorly near the eustachian tube.

This preliminary data demonstrates short-term reduction in snoring loudness and bother following a single RFA treatment of the lateral palatal space. This contrasts to the control group with RFA to the inferior turbinates in isolation.
which had little effect. Although this data has limited power due to the small sample size, the modification of treatment locations is a minor change to a currently established procedure that has demonstrated effectiveness and low morbidity.

Conclusion

This limited series offers evidence that volume reduction of the fat in the lateral space and associated scarring alters the properties of the palatopharyngeus and surrounding muscles and reduces phonic vibration. Although further data on effectiveness of snoring reduction, duration of effect, and appropriate patient selection is required, the low risk of major complications makes ablation of this space a potential option for individuals who are already candidates for palatal RF procedures.

References


Edited by Jing Li