Mini Inferior Turbinoplasty-Tunneling Technique

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Received: 15 January 2018 / Accepted: 26 February 2018 / Published online: 28 February 2018
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Abstract Techniques for inferior turbinate reduction vary with various surgical methods, which differ in the approach of preservation of tissue from total turbinectomy to limited submucosal cauterization. Our preferred method to address hypertrophic inferior turbinate by mini turbinoplasty-tunneling technique are presented. Critical steps include creation of window in the inferior turbinate with a 4 mm microdebrider blade and removal of both inferior turbinate mucosal hypertrophy and bony component to convert a convex looking inferior turbinate to concave shape. This allows proper debulking of the entire medial aspect of the inferior turbinate and widening of the nasal valve area. Mini turbinoplasty-tunneling technique for hypertrophic inferior turbinates, is a safe method in achieving turbinate size reduction with minimal morbidity and long-term relief of nasal obstructive symptoms without added risk of complications.

Keywords Nasal obstruction · Inferior turbinate reduction · Tunneling · Microdebrider

Introduction

Inferior turbinate pathology in the reduction of nasal air-flow is well documented. When medical treatment for patients with hypertrophic turbinates or vasomotor rhinitis fails, they may benefit from turbinate reduction procedures. There are several techniques of turbinate reduction which include turbinectomy, submucous turbinectomy, inferior turbinoplasty, cryotherapy, submucous electrosurgery, CO₂ laser turbinoplasty, Coblation channeling and others [1]. Each technique is associated with its own short-term and long-term complications such as bleeding, crusting and rehypertrophy of the turbinate [2].

Techniques such as partial or total inferior turbinectomy, cryosurgery, electrocautery and laser all destroy the mucosa, thereby interfering with nasal physiology. Mini turbinoplasty by tunneling technique of the inferior turbinates is designed to preserve the mucosa which also permits endoscopic visualization similar to a tunnel allowing visualization of inferior turbinate bone which can also be reduced under vision. Powered instrumentation offers advantages compared to other techniques with regard to complications and mucosal preservation [3–5].

Preparation

For a right-handed surgeon and the patient's head placed in the neutral anatomic position with the operative bed placed in 15°–20° reverse trendelenburg position. Under Local Anaesthesia, gentle nasal packing done with ribbon gauze soaked with 4% lignocaine with adrenaline in the ratio of 1:1 for nasal decongestion and analgesic effect. Transpalatal and sphenopalatine ganglion blocks with 23 gauge spinal needle (0.5 cc) were performed bilaterally with 1%

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s12070-018-1292-9>) contains supplementary material, which is available to authorized users.

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lignocaine within 1/100,000 adrenaline. The inferior turbinates were injected with the same solution in a submucosal plane. If combined with other sinus surgeries, patient may be taken under General anesthesia but the above infiltrations are given to get better hemostasis and plane of dissection.

Description

The procedure commences with the creation of a window in anterior end of head of the inferior turbinate with a straight microdebrider (4-mm tip with tricut blade or serrated). The inferior turbinate soft tissue with bony component was debrided at 5000-cps oscillating mode for soft tissue and non-oscillating mode for bony component in a ventro-caudal manner. Debridement was performed with the blade positioned laterally which is the tunneling technique, with intent of converting a convex looking inferior turbinate to concave. This allows proper debulking of the entire medial aspect of the inferior turbinate and widening of the nasal valve area. Particular attention was paid to preserve the mucosal flap. Tunneling should be done up to the posterior end of the inferior turbinate without making button holes in the medial mucosa.

Tunneling technique could also pocket visualization by a 0° rigid hopkins endoscope. With endoscopic vision undebrided hard bones are removed with thru-cutting instruments and loose bony fragments with tilley's nasal dressing forceps. We haven't come across severe bleeding needing cautery as per senior authors 7 years' experience of over 900 cases. The reduction in size of the inferior turbinate was easily recognized immediately after approximating mucosal surface at the site of window created. No packing of the nasal cavity was done post procedure. Complications of bleeding, crusting, foul odor, mucosal tears, synechia were minimal, with no nasolacrimal duct injury. Postoperatively long term follow up to 5 years, the size of the inferior turbinate have significantly reduced with good nasal airway passage compared to preoperative status (Figs. 1, 2, 3, 4, 5)

Postoperative Care

Nasal irrigation commences on postoperative day 1 and the patient follows up between 7 and 10 days postoperatively for removal of any crusting over the anterior end the inferior turbinate (window area)

Fig. 1 Endoscopic view of the Right side inferior turbinate. (Convex Shape inferior turbinate)

Fig. 2 Creating a window in the inferior turbinate with a 4 mm microdebrider blade

Fig. 3 Debrider used for removal of the Right hypertrophic inferior turbinate mucosal and bony component

Conclusion

Mini turbinoplasty-tunneling technique of inferior turbinates is a safe method of achieving turbinate size reduction without morbidity encountered in other turbinate procedures due to nasal airway obstruction secondary to turbinate disease. Bleeding is a rare complication. Preservation of mucosa leads to early healing and absence of crusting and exposed bone. Tunneling technique lends itself to precise tissue removal with satisfactory reduction of

Fig. 4 Removal of additional bony component using Tilley nasal forceps through tunnel created allowing endoscopic visualization of the Right inferior turbinate ventro-caudal aspect. Tunneling Technique

Fig. 5 Post removal of mucosal and bony component of Right inferior turbinate. After approximating mucosal surface at the site of window created. (Concave shape Right inferior turbinate)

tissues. The final results takes up to 3 months for the fibrosis to set in the submucosal plane.

Author's Contributions AN: Performed surgery, own surgical technique and patient preoperative and postoperative management and follow up. RDK: Preparation of the manuscript, literature review and review of manuscript.

Compliance with Ethical Standards

Conflict of interest All authors declares that they have no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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