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Middle Turbinate Saving Technique in Cribriform Plate CSF Leak Repair

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Abstract

Introduction: Middle Turbinate is an important structure of lateral nasal wall for air-conditioning of inhaled air. We need Middle turbinate as a landmark for revision surgeries if any. Saving Middle Turbinate would be a great Idea if we can perform surgery with same good exposure and not sacrificing nasal one structure.

Method: In cases planned for CSF repair from Cribriform plate, usual investigations and surgical procedures were followed. We cut the necessary anterior attachment of Middle turbinate and push it downwards, keeping its posterior attachment intact. After the surgery and sealing the Cribriform area with Fascia, the Turbinate is brought to its normal position and Merocel packing is done below turbinate.

Results: Three patients were done CSF repair having leak from one side Cribriform plate. Middle Turbinate saving procedure was followed. Per operative and post-operative results noted.

Conclusion: We can save Middle turbinate for normal Rhinological function and as surgical landmark in CSF leak repairs.

Keywords: Middle Turbinate; CSF leak; Cribriform plate;

Introduction

Middle Turbinate is an important structure of lateral nasal wall for air-conditioning of inhaled air, more importantly we need Middle turbinate as a landmark for revision surgeries if any. Saving Middle Turbinate would be a great Idea if we can perform surgery with same good exposure and not sacrificing one structure.

Review of Literature

Middle Turbinate is supplied mainly by branch of Sphenopalatine artery which enters it from posterior end and also a branch of anterior ethmoidal [1]. The Blood supply to the middle turbinate arises from the proximal portion of the posterior lateral nasal artery just after sphenopalatine foramen. The middle turbinate can be preserved in almost all, endoscopic skull base surgery while providing good exposure for surgery and skull base reconstruction. Postoperative sinonasal function may be better preserved with this technique [2,3]. The endoscopic transsphenoidal approach to the midline skull base structures has been increasing in popularity as it provides a minimally invasive yet maximally aggressive therapeutic treatment option. Short-term outcomes compare favorably to more traditional open or microscopic approaches [4-7]. The turbinates are important nasal structures that help humidify, filter, and regulate temperature of nasal airflow before entering the lower airways. They also provide nasal resistance and contain sensory fibers essential for the perception of nasal airflow. In addition, the middle and superior turbinate contain olfactory fibers in the superior region. Finally, the middle turbinate serves as an important surgical landmark for the skull base, frontal sinus, and orbit [8].

The indications for partial or total middle turbinectomy in the setting of sinusitis are controversial. Most surgeons agree that a compromised middle turbinate secondary to polypoid degeneration, concha bullosa, or a paradoxical middle turbinate contributing to nasal obstruction or sinus disease is an acceptable reason to remove a portion of the turbinate. However, routine turbinectomy for surgical access to the paranasal sinuses has become less favorable amongst surgeons in recent years. Many surgeons describe the routine sacrifice of one or both middle turbinates in endoscopic transsphenoidal skull base surgery, whereas other authors report adequate visualization and surgical access with preservation of this structure. Saving middle turbinates in nasal surgery is needed to save nasal functions. Concerns about partial or total middle turbinectomy include alteration of nasal function, synechia formation with

obstruction of sinonasal outflow tracts, promotion of frontal sinusitis, development of hyposmia, formation of excessive scar tissue, intra- and postoperative epistaxis, increased crusting postoperatively, loss of anatomic landmarks for revision surgery, and development of atrophic rhinitis or empty nose syndrome [9-13].

Material and Methods

In cases planned for CSF repair from Cribriform plate, usual investigations and surgical procedures were followed. We cut the necessary anterior portion of Middle turbinate and push it downwards, keeping its posterior attachment intact. After the surgery and sealing the Cribriform area with Fascia, the Turbinate is brought to its normal position and Merocel packing is done below turbinate.

Result

Three patients were done CSF repair having leak from one side Cribriform plate. Middle Turbinate saving procedure was followed. Per operative and post-operative results noted. In all three no difficulty in operative field was felt. Saved and displaced Middle turbinate did not come in operative field in any way. No problem in instrumentation was noted. Middle turbinate was easily replaced back in all three and Merocel packing done. No problem in pack removal was felt.

In all three uneventful CSF leak stopped.

a) Patients were followed for maximum 12 months. No dryness change in smell, empty nose syndrome or any complaint was present.

b) Post-operative endoscopic picture was as natural as normal nasal study in all three.

c) Post-operative CT Scan PNS revealed full length normal Middle turbinate in all three but the of left Middle Turbinate at Lamina Paparacia.

Discussion

As arterial supply of Middle turbinate comes from both the ends, while detaching Middle turbinate in Cribriform plate CSF leak cases we preserve the posterior attachment of Turbinate and keep it downwards with its intact posterior Sphenopalatine supply (Figure 1). As it is pushed down there is no hindrance in surgical field. After the surgery Turbinate is brought to its possible natural position. Giving normal looking anatomy. Per operative it gives a good live tissue support and pressure to the material kept for sealing like Fascia and may help in early vascularization of the graft (Figure 2). All the functions of Middle turbinate like humidification of inhaled air, filtration and temperature controls are unaffected. Chances of empty nose syndrome is avoided. Post operatively in case of any revision surgery Middle turbinate being important landmark is saved. The replaced Middle turbinate is attached at different place from its natural attachment in post-operative CT Scan PNS. So, if revision surgery is planned and done for any reason, we should keep in mind that its changed attachment may misguide as landmark (Figures 3 & 4).

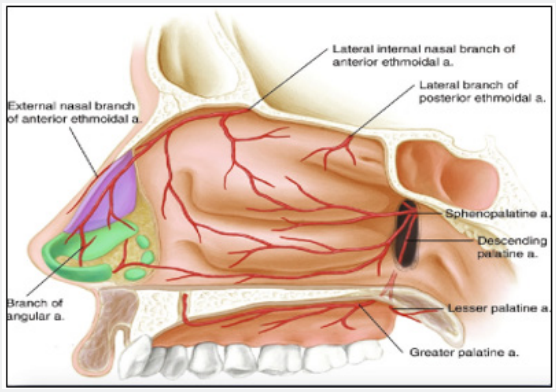

Figure 1: Arterial supply of Middle Turbinate.

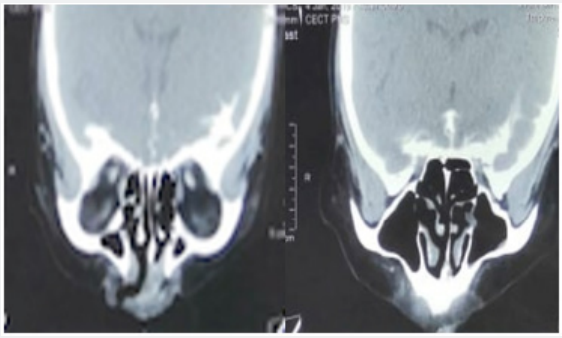

Figure 2: Showing attachment of left Middle turbinate at Cribriform plate

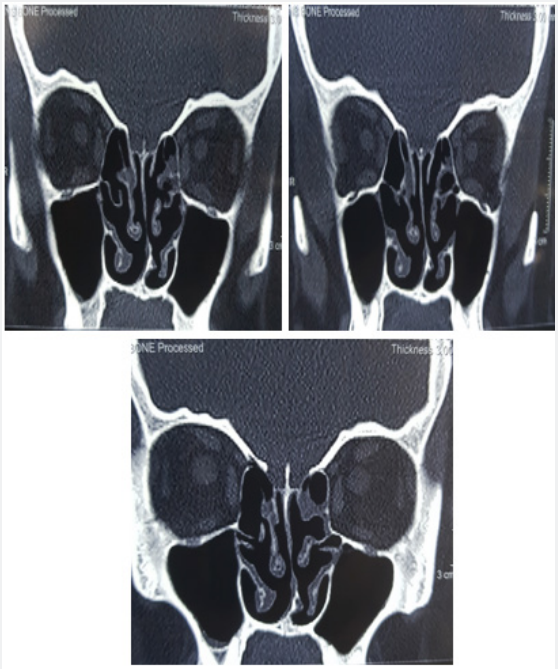

Figure 3: Post-Operative lower displaced attachment of left Middle Turbinate at Lamina Paparacia.

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Figure 4: Post-Operative look of left Middle Turbinate.

Conclusion

We can save Middle turbinate for normal Rhinological function, as surgical landmark and for better post-operative result in CSF leak repairs.

Summary

i. Middle Turbinate is an important structure of lateral nasal wall for air-conditioning of inhaled air.

ii. We need Middle turbinate as a landmark for revision surgeries if any.

iii. Saving Middle Turbinate in cribriform plate CSF Leak surgery would be a great Idea if we can perform surgery with same good exposure.

iv. Thus, we are not sacrificing one structure (Turbinate) and doing surgery without compromising exposure.

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