


**How I do it –**

## **Powered Inferior turbinoplasty in children**

Rubasinghe MS<sup>1</sup> 


<sup>1</sup> - Consultant ENT and Head & Neck Surgeon, Lady Ridgeway Hospital for Children, Sri Lanka

### **Abstract**

Powered inferior turbinoplasty in children is described in detail in this “How I do it” article. This procedure is not commonly done in either children or in adults in the local setup. The procedure is simple, rarely gives complications and relatively easy. Equipment and instruments needed for this procedure are available in most of our ENT theatres.

**Key words:** Inferior turbinate hypertrophy, Microdebrider, nasal obstruction, Paediatric

**Copyright:** © 2021 Rubasinghe MS

This is an open access article distributed under the [Creative Commons Attribution License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/)   
This license lets others distribute, remix, tweak, and build upon the work, even commercially, as long as they credit the original author for the creation.

**Funding:** None

**Competing interest:** None

**Correspondence:** Dr.M.S.Rubasinghe (dileepdenta@yahoo.com)

Published Date : 31<sup>st</sup> December 2021

## Introduction

Inferior turbinate hypertrophy in children can be troublesome causing nasal obstruction and snoring, sometimes leading to poor sleep hence a poor quality of life. When medical management fails, which is usually a trial of a steroid nasal drops or aerosol spray for at least 3 months, a surgical procedure is recommended for symptomatic relief<sup>[1]</sup>. Commonly done procedures in children with this regard are inferior turbinate reduction using needle monopolar submucosal diathermy or bipolar surface diathermy of the anterior half of the inferior turbinate. Inferior turbinate powered reduction is not commonly done in children and this article depicts how the surgeon performs the procedure.

## Surgical steps

Under general anaesthesia both inferior turbinates are in-fractured. Nasal cavities are packed with patties soaked in Moffett's solution. (1ml of 1:1000 Adrenaline, 1ml 10% Cocaine and 6ml 0.9% Sodium chloride). Patties are placed under direct visualization using a zero degree rigid nasal endoscope and with a help of a Tilley's nasal dressing forceps and a Freer's elevator. (Figure 1) Patties are strategically placed in the inferior meatus, over the turbinate and in between the septum and the medial surface of the inferior turbinate. Altogether 6 patties are used on both sides of the nasal cavities and left for 1 minute. Once the packs are taken out by pulling their attached strings, the turbinates would appear much more decongested. The rigid endoscope could be easily passed down to the post nasal space.

Next step is placing the microdebrider with a suitably sized blade in the inferior meatus with the blade rotated medially on to the lateral surface of the turbinate mucosa. With the debrider in the oscillation mode, soft tissue is gradually removed from anterior to posterior direction until the turbinate bone is exposed (Figure 2). Once the bone is exposed a FESS ball probe is used to separate the bone from underlying mucosa (Figure 3). Once the bone pieces are completely freed, they are piecemeal removed with a 45 degree upturned or straight Blackesely forceps<sup>[2]</sup>. This has to be continued anteriorly and posteriorly. Anteriorly the turbinate bone becomes thicker and a paediatric backbiting forceps may need to be used (Figure 4). Removing the bone at the head of the turbinate is important as this region is the narrowest and hence crucial in the intra nasal airway.

Once the bone is adequately removed, the redundant thick mucosal can be carefully trimmed leaving the medial surface intact. Extra soft tissue is reduced until such that the remaining mucosal layer can be rolled upon itself to cover the raw bone<sup>[2]</sup>. A Free elevator can be used for this purpose. By this way the bulk of the turbinate can be downsized to half of the original.

In the end, after measuring the length of the turbinate, a rectangular piece of oxidized regenerated cellulose net (Surgicel) is draped over the reduced turbinate to keep the rolled up mucosal in place. (Figure 5)

The procedure is relatively bleeding free and if at all requires nasal pack made of biocompatible PVA sponge (Netcell) pack coated in Oxytetracycline and 1.0% hydrocortisone in petroleum base (Tetracort). The pack has to be downsized to the length and the height of the nasal cavity of the child.

### **Postoperative care**

Once the packs are removed in 24hours' time the child can be discharged home on 0.9% Saline nasal douching followed by Betamethasone nasal drops and oral Co-Amoxyclav for 1 week. There is hardly any crust building and post-operative rigidnasal endoscopy is performed in the ward in 2 weeks' time under a local anaesthetic spray. By this time there is usually a significant symptomatic relief of the nasal obstruction.

Figure 1 – Patties soaked in Moffett's solution in the nose



Figure 2 – Microdebrider blade under the inferior turbinate



Figure 3 – Removal of turbinate bone

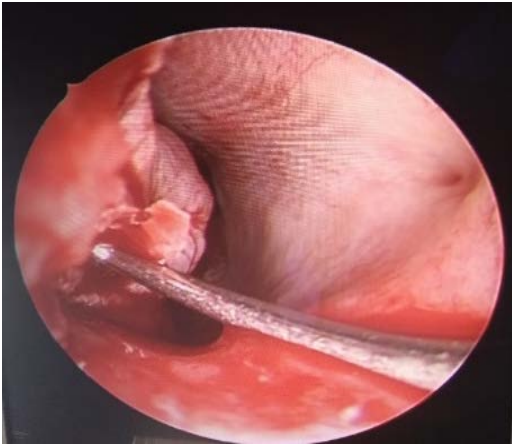


Figure 4 – Removal of the bone in head of the inferior turbinate with the backbiter

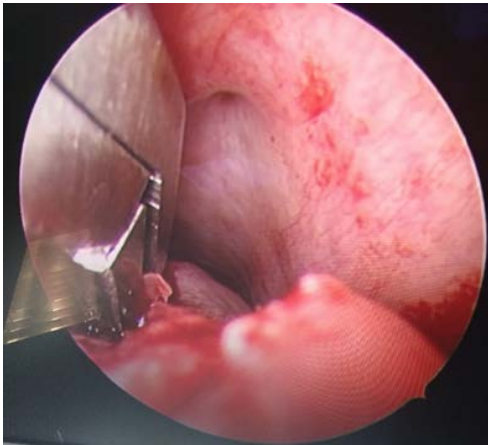


Figure 5 - Rolled mucosal over the exposed tissue and Surgical drape



## Discussion

In patients with intractable inferior turbinate hypertrophy, surgical reduction can improve the nasal airway<sup>[1]</sup>. Drastic techniques like removal of the inferior turbinate either complete or partial may lead to conditions like atrophic rhinitis particularly in a hot and humid climates. Furthermore, during the procedure a significant blood loss may occur from the already vascular turbinate or due to damage of the branches of Sphenopalatine artery to the inferior turbinate<sup>[2,3,4]</sup>. Even after a successful turbinectomy and having a very spacious nasal cavity, patients may continue to feel the sensation of nasal blockage. This may be due to the loss of mucosal cover over the medial and superior surface of the inferior turbinate which has air flow receptors<sup>[2]</sup>. (Note -turbinectomy is not recommended in children.)

Other procedures like submucosal diathermy which is a blind procedure may initially be successful but may not have long term effects. Rarely this may lead to osteomyelitis of the underlying turbinate bone. Surface diathermy may lead to excessive crusting and this can be uncomfortable and causes nasal obstruction. Removal of the crusts can cause troublesome nasal bleeding.

In Powered inferior turbinoplasty, the mucosal over the medial wall of the inferior turbinate is preserved. This preserves the airflow receptors. The procedure has relatively less bleeding and the post-operative packing of the nose may not be required. This is very important in children as nasal packing is usually very distressing for them. At the end of the procedure the bulk of the turbinate can be about half of the initial size<sup>[2]</sup> and crusting will not be bothersome as the medial mucosa is preserved.

## Conclusion

Powered Inferior turbinate reduction is very effective and relatively complication free<sup>6,7,8</sup>. Since zero-degree rigid nasal endoscope and a Microdebrider are available in most of our ENT units, the procedure does not require any advanced equipment. It can be applied to both adults and children likewise.

## References

1. Swift A C, Leong S C. Scott-Brown Otolaryngology, Head and Neck Surgery. 8th Edition (2018) Volume 1, The management of enlarged turbinates. Chapter 105 :1157-1168 <https://doi.org/10.1201/9780203731031-106>
2. Wormald PJ. (2018) Endoscopic Sinus Surgery Anatomy, Three Dimensional Reconstruction, and Surgical Technique. Powered Inferior Turbinoplasty 4:22-32 <https://doi.org/10.1055/b-0038-149997>
3. Roy R Casiano, Islam R Herzallah, Amy S Anstead, Jean Anderson Eloy Adam Folbe Lori A Lemonnier and Belachew Tessema (2012) Endoscopic Sinonasal Dissection Guide. Basic Endoscopic sinus dissection, Inferior turbinoplasty and submucous dissection of the inferior turbinate5:23-25. <https://doi.org/10.1055/b-002-85460>
4. Randall DA. (2003) Essential Otolaryngology. The nose and paranasal sinuses30:713.
5. Hoseman W, Fanghanel J. (2005) A dissection course on Endoscopic Endonasal Sinus Surgery: Inferior turbinoplasty8.12:33
6. Yu-Lin Chen, Chia -Ming Liu, Hung- Meng Huang. Comparison of microdebrider assisted inferior turbinoplasty and submucosal resection for children with hypertrophied inferior turbinate. Int. J. Pediatr Otorhinolaryngol 2007Jun;71(6):921-7. <https://doi.org/10.1016/j.ijporl.2007.03.002>. PMID:17418425
7. El Henawi DEDM, Ahmed MR, Madian YT. Comparison between Power -Assisted turbinoplasty and submucosal Resection in the Treatment of Inferior Turbinate Hypertrophy ORL 2011;73:151-155, DOI <https://doi.org/10.1159/000327607> .PMid:21508655
8. Ragab A, Elbanhawy O, Khashba A, Ali A, AbdellAziz M. Menoufia Medical Journal .2016 Issue 3. Vol 29,504-509. <https://doi.org/10.4103/1110-2098.198688>