

ORIGINAL ARTICLE

Inferior turbinate reduction by use of Diode Laser. A study on surgical outcome, post-operative crusting, and bleeding

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ABSTRACT

Objectives: To assess the efficacy of the technique regarding the surgical outcome, post-operative crusting, and bleeding.

Design: Single Blind interventional type of study.

Study Place and period: This study was conducted at, Chaudhary Muhammad Akram Teaching and Research Hospital Lahore from July 2018 to June 2019.

Material and methods: The study included 100 patients and the results of technique in respect to surgical outcome, the safety of technique regarding post-operative complications like crusting in the postoperative period and epistaxis were analyzed.

Results: A total of 100 patients were included for research. Their ages were between 10-40 years. It was concluded that almost all the patients had felt improvement in their nasal blockage and postnasal discharge. The sneezing and headache in these patients also have been improved. Ten patients presented with nose crusting and 4 patient presented with mild epistaxis. No active intervention was not required in any patient.

Conclusion: It was concluded that reduction of inferior turbinate by Diode laser is an excellent, and safe option, regarding the surgical outcome, and complications faced by patients registered for turbinate surgery.

Keywords: Turbinates reduction, Diode laser, epistaxis.

INTRODUCTION

The nasal turbinates are shelf-like bones present in the lateral wall of the nose. Their main function is temperature control and humidification of air going to the lungs. They also control the flow of air going through the nose. This function is mainly controlled by inferior turbinates, so their enlargement hinders the airflow passing through the nose causing nasal obstruction.

Nasal blockage due to Inferior turbinate hypertrophy may be a minor problem to some patients but to others, quality of life is greatly affected by it. There are many nasal diseases in which turbinate size enlarges. These diseases are allergic rhinitis, non-infective perennial rhinitis, and non-specific hypertrophic rhinitis. The other symptoms in manageable by medicines. The medicine used is nasal decongestants, antihistamines, and local or systemic steroids. Those patients which are not treatable by medicines are registered for Surgical reduction². There are a lot of options for the reduction of the inferior turbinate. These are silver nitrate cautery, partial turbinectomy under general anesthesia turbinoplasty, electric cauterization, cryosurgery, and lasers^{3,4}. Every procedure has its limitations regarding results and associated complications. The most common postoperative complications are pain, epistaxis, nasal adhesions, and crust formation. So the best surgical option for turbinate reduction should be effective, quick, safe, with minimal or no hospital stay.

The use of a laser to reduce the turbinate is a modern technique. The benefits of laser are bloodless field and painless surgery with precision. The healing is fast, operation time is less, theater time saved, and hospital stay is very less. There are multiple lasers available to perform surgery like CO₂, KTP, NdYAG, argon, and Diode Lasers. Every laser has its own function. Some have a better coagulation effect, other has better cutting and evaporating effect, some have better results at pigmented tissues. We used a Diode laser in our study for turbinate reduction. It has excellent tissue cutting, coagulating, and evaporating effects without pain and bleeding.

MATERIALS AND METHODS

This prospective study was carried out on 100 patients with symptomatic bilateral inferior turbinate hypertrophy, which were not responding to medical treatment. The study was conducted at the Department of Otorhinolaryngology, Azra Naheed Medical College Lahore from July 2018 to June 2019.

Selection criteria: Patients with a history of nasal blockage, nasal discharge, headache, and sneezing, due to inferior turbinate enlargement, not responding to medical treatment were included in the study.

For selecting the patients for surgery, patients were registered. The next step was to make history, in which the patient's symptoms were noted, thorough examination including ENT examination like anterior rhinoscopy, posterior rhinoscopy, and nasendoscopy was done. The next step was to reduce the size of inferior turbinates with help of a Diode laser under local anesthetic with xylocaine.

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To perform surgery Diode laser of 980 nm wavelength with the power of 10 watts, from Lasotronic company was used on both continuous and impulse mode. 15-20 impulses were given on each side of inferior turbinates.

None of our patients required anterior or posterior nasal packing. For post-operative analgesia ibuprofen was given along with xylometolazone, for 3-5 days. The patient was ready to go home after 10 minutes under observation. For follow up Patients were called after 1 week, then after 1, 3, and 6 months consecutively. The purpose of each post-operative visit was to see the improvement in symptoms, check the progress in healing and, any adhesion or crust formation.

RESULTS

Among 100 patients, 40 were female and 60 were male. The patient age was between 10–40 years. The patients in this study group had bilateral inferior enlargement without any other intranasal pathology like polyps, sinusitis which was confirmed by endoscopy and CT scan of the nose & paranasal sinuses. The average duration of surgery was 10 minutes. The main pre-operative symptoms with their percentage is shown in

Table 1: Preoperative Symptom of Patients

Symptoms	No of patients having symptoms	Percentage
Nasal blockage	100	100%
Nasal discharge	90	90%
Sneezing	75	75%
Headache	65	65%

Postoperative no single patient had any serious complications needing some serious intervention. crust formation was seen in few patients. Other symptoms were mild epistaxis, pain, and mucosal edema in a minor no of patients

All of the patients have inferior turbinate size reduced at all the follow-up visits. The relief in the individual symptom was excellent. The analysis of the surgical outcome was very encouraging, as shown in table -2

Table 2: Reduction of Preoperative symptoms after treatment

Pre-operative symptoms	Symptomatic relief in %
Nasal blockage	95%
Nasal discharge	85%
Sneezing	70%
Headache	60%

DISCUSSION

Nasal blockage, nasal discharge, sneezing, and headache are the main complaints that are faced by patients due to inferior turbinate enlargement. Daily activities of the patients were greatly affected by it. Patients who do not respond to medical treatment with ITH, the top recommended treatment is medical and surgery. To decrease the volume of the inferior turbinate various procedures are recently available⁵. Every surgeon has their own experience regarding the selection of surgical methods and their results⁶. The purpose of the surgery in these patients is to reduce the size of inferior turbinates to diminish complaints of patients, with fewer or minimal side effects^{6,7,8}. In another study they reported the effectiveness

of linear visual scale in the assessment of nasal symptoms⁶.

The results of different study revealed that the assessment of allergic symptoms specifically in obstruction of nasal might be a possible predictor in the absence of rhinology examinations. Due to inferior turbinate enlargement, postoperatively it was observed that patients have significant improvement in all the symptoms as well as in nasal obstruction.^{7,8,9}

Few of the patients have worse nasal obstructions. Initially, after surgery, nasal obstruction get worse in few cases which is due to the postoperative complications. There was significant improved results of nasal blockage by the end of the first week. Janda p et al^{10,11,12}, reported that after six month of surgery turbinates decrease by Diode laser had good improved nasal obstruction and nasal airway resistance was reduced as well.

Rhee et al.^{13,14,15} compared two treatments (group 1 =diode LTR and group 2= RFVTR) patients were followed up for eight weeks after in group 1, majority of the patients had significant improvement in frequency and severity of nasal obstruction.

Nasal discharge complaints were observed in all patients postoperatively. After 1 week there was a significant improvement in rhinorrhea. Due to inflammation only 4 patients complained about worsening of rhinorrhea. The absence in rhinorrhea was due to the destruction of highly vascular turbinates tissues, reducing the seromucous glands, and desensitization due to destruction of branches of the posterior nasal nerve, to be involved in initiating sneezing and hypersecretion of the nasal mucosa. Relief in rhinorrhea continued in 85% of the patients at the end of the 6 months follow-up. It was seen in different studies that post-operatively, KTP LTR showed a significant decrease in rhinorrhea^{16,17,18}

Sneezing was reported by 80% of the patients preoperatively. Patients were followed up for 6 months it was established that most the patients (75%) had got relief in sneezing. Destruction of the branches of the posterior nasal nerve and replacement of nasal mucosa is the reason of relief in sneezing. These results are related to previous studies¹⁹.

It was also observed that headache was also improved in 79.4% of the patients which were followed by 6 months the reason behind the improvement is may be due to nasal patency^[10].

Intraoperative or postoperative complications were insignificant. During the instant postoperative period, 4 (4%) of the patients had mild nose swelling. Only 4 (4%) of the patients had a blood-stained nasal discharge. The bleeding was managed conservatively by xylometolazone nasal drops. At the end of the procedure only 5 (5%) patients reported about mild pain. During the postoperative follow up no patient had pain at the end. In Papon et al.¹⁹ series, it was found that only fewer patients who underwent Nd: YAG laser turbinate reduction had pain.

Only in 2 patients epistaxis was reported in first week.. the method to control bleeding was with topical decongestant drops. At the end of the follow up no patient had complaint about bleeding. The postoperative bloody discharge following LTR was 0–20.1% [8]¹³.

At 1-week postoperatively only in 7 patient crusting was noted. At the end of 1 month 4 patients had nasal crusting, and at the end of 3 months in no patients had complaints of crusting. In another study²⁰, Patients who underwent Nd: YAG laser turbinate reduction 41,6% of cases had crusting.

There was no adhesion formation, septal perforation, or epiphora in our study. The importance of our study is that It had maximum symptomatic improvement with minimal complication. It saves the patient and operation theater time. The patient is free to go home within 10 -20 minutes time. It has proven to be the safest method to be performed for inferior turbinates reduction, so improving the symptoms of patients so improving quality of life.

CONCLUSION

This prospective study showed that for inferior turbinate hypertrophy, Diode Laser turbinate reduction procedure is safe, effective in releasing the associated symptoms with ITH, and can be accomplished on a daycare basis under local anesthesia. Intra-operative and post-operative complications were minor. The improvement in post-operative average VAS score of symptom was statistically significant in long-term follow-up of patients. the main complaint following LTR was crusting, but it cleared within one month, and no long term complication was noted It has reduced the morbidity, and complication rate, with the better surgical outcome and saved the time of the patient and ENT Surgeon, however, there is always a room for further improvement in the technique regarding patients management .

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