ORIGINAL ARTICLE

Comparison of doing partial inferior turbinectomy with and without application of clamp with respect to per-operative bleeding: Review of results

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Abstract:

Objective: To compare the two techniques of bilateral partial inferior turbinectomy

Study design: Prospective, randomized comparative study

Place and duration of study: The study was conducted over a period of 2 years form June 2007 to May 2009 at Ziauddin Hospital, KDLB campus & Karachi Adventist Hospital, Karachi..

Patients and Methods; A total of 48 patients underwent bilateral partial inferior turbinectomy. They were randomly divided into 2 groups. Group-A patients had turbinate trimming done in a traditional way while Group-B patients underwent turbinectomy after application of a long hemostat clamp to crush its fringe before resection. A comparison was made between the 2 groups in term of time duration of surgery, intra-operative blood loss, duration of hospital stay, bleeding after pack removal and the need to readmit the patient after discharge.

Results: The average time taken by surgeon to perform turbinectomy in group-B was 12-14 minutes which was 56% less than group-A which was on average 20-25 min. In group-A the average intraoperative blood loss was 75 cc. while in group-B it was only 25 cc., (33% of the group-A). 87% of the group-B patients were discharged on the first post-op day while only 37% of the patients in group-A were discharged on first day and 63% were discharged on second or third day. After pack removal on first day, 58% of the group-A patients needed to have a pack reinserted but only 2 patients in group-B needed that. 3 patients out of 24 in group-A were readmitted to the hospital after being discharged home because of uncontrolled bleeding, while none of the patient in group-B needed readmission. On follow-up visit, 37% of the patients in group-A complained of intermittent mild bleeding at home while only 16% of the patients in group-B had this complaint.

Conclusion: The modified technique utilizing a clamp to crush the cut end before surgery as described in this article clearly demonstrate its advantages over the standard technique in terms of a shortened operation time, reduction in blood loss and less incidence of post-operative complications. This technique is easy to apply and is recommended for turbinectomy.

Key words: Nasal obstruction, Inferior turbinates, partial turbinectomy, turbinectomy

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Introduction:

Nasal obstruction is one of the most common complaints in otolaryngology practice. It may result from a deviated nasal septum, allergic and other types of rhinitis (infective, vasomotor, medicamentosa), foreign bodies, nasal polyps or benign and malignant tumors. Allergic and vasomotor rhinitis are very common conditions seen in our population due to various factors and their long-term presence produces hypertrophy of the turbinates especially inferior turbinate, that contributes significantly to nasal obstruction.

Patients with Allergic Rhinitis are usually offered conservative therapy with antihistamines, decongestants (systemic and topical nasal), mast cells stabilizer and nasal corticosteroids sprays[1].

These medical measures reduce the symptoms of allergic rhinitis such as irritation, sneezing and rhinorrhea but enlarged turbinates often fail to shrink and continue to cause nasal obstruction. Long-term and injudicious use of topical decongestant adds up to the problem by causing "rhinitis medicamentosa". These patients are offered surgical treatment option for the reduction in the size of inferior turbinate. A number of techniques have been used in past that includes; submucosal diathermy (SMD), partial inferior turbinectomy, total inferior turbinectomy, turbinoplasty, cryotherapy and submucosal resection of the turbinate[2].(1) A recent addition to this armamentarium is endoscopic shaver turbinectomy and coblation[3].(2). However the surgery widely practiced in our setup is "bilateral partial inferior turbinectomy".

The inferior turbinates are very vascular structure; rich in various secretory glands and large venous sinusoids, owing to their functions in the nose. One of the risks of turbinectomy is hemorrhage. Patients with coagulopathies and those taking NSAIDS or anticoagulants have an increased risk of this complication. Although new and better tools for turbinectomy are now becoming available to the otolaryngologists as mentioned earlier, but these expensive and sophisticated tools are not widely available.

Still the widely practiced technique is traditional or classical partial inferior turbinectomy using a 'turbinate scissors' to trim the anterior half to 2/3rd of the inferior turbinate ,what is commonly referred to as inferior "fringe". Although it is one of the most rewarding surgery in terms of relief of symptoms[9], this surgery is often associated with a high risk of intraoperative and post-operative hemorrhages. This factor only, accounts for increased intraoperative time, need to keep the pack for long duration and sometimes need to reinsert the pack after removal, increased hospital stay and sometimes re-admission to the hospitals. These complications often preclude a surgeon to perform this surgery.

A modification of this technique is presented in this article in which a long-blade straight artery clamp is applied to the inferior turbinate on the narrow area along its attachment to the lateral nasal wall. It is applied to crush fringe of turbinate before it is being resected out surgically. This technique allows precise, accurate and quick resection of the inferior turbinate and significantly reduces the bleeding and hence reduces the operative time and lessens the post-operative hospital stay. The author has compared this modified technique with the standard or traditional technique of partial inferior turbinectomy and presents the result.

Material and methods:

The current study was a randomized, comparative study done prospectively to compare the two techniques of turbinectomy. The study was conducted over a period of 2 years form June 2007 to May 2009 at Ziauddin Hospital KDLB campus and Karachi Adventist hospital, Karachi. This study included 48 patients; out of them 28 were males and 19 were females; age range varied from 16 to 49 years. These patients were selected for bilateral partial inferior turbinectomy only since they were suffering form inferior turbinate hypertrophy refractory to medical treatment. Any patient undergoing septoplasty or some other additional surgery along with turbinectomy was excluded. All the patients had a blood CBC and PT, APTT done to rule out any coagulation disorder, none of the patient were receiving any NSAIDS or anticoagulants before surgery. The patients were equally divided randomly into two groups. 'Group A' constitute the patients who underwent partial inferior turbinectomy in a standard fashions, while 'group B' constitute the patient who underwent surgery using a clamp.

All of the patients were admitted 5-6 hours before surgery. All surgeries were performed under general anesthesia with oro-tracheal intubation and the throat was packed in a standard fashion to prevent trickle down of blood into the hypopharynx. The nose was packed with ribbon gauze soaked in a mixture of 4% xylocaine solution with Xylometazoline prior to the surgery and pack was left for at least 5-7 minutes. Once packs were removed the inferior turbinates were

Figure 1:

Figure 2:

medialized using a blunt freer type of elevator and were trimmed by an angled turbinectomy scissors. Resection included the mucosa as well as part of the bone, the extent of resection depend on the degree of hypertrophy. In group –B patients, prior to this resection a long straight artery clamp (Figure 1) was applied for 2-3 minutes on the narrow area along its attachment to the lateral nasal wall. It was applied to crush the fringe of turbinate before it is resected (Figure 2).

In both cases the hemostasis was secured by putting ribbon gauze soaked in Xylocaine and xynosine solution. The blood loss was accurately measured by calculating both the amount of blood being sucked in the suction bottle and by weighing the gauze pieces in a standard fashion. During surgery no irrigation fluid was used. The duration of surgery was noted accurately by using a stop-watch for comparison. After surgery the nose was packed by ribbon gauze impregnated in polyfax skin ointment. Any blood loss in the recovery or ward was noticed carefully. Patients were kept in the hospital, packs were removed on first post-op day in all the patients and they were observed for 2-3 hours in the ward. In case of no further bleeding, they were discharged on the same day. If they had any episode of active bleeding after pack removal, a new pack was immediately reinserted in the ward and they were kept in hospital for another 24 hours after which the pack was taken out and they were discharged accordingly.

Patients were followed up one week after surgery, a standard treatment was given to all the patients postoperatively and they were instructed to call or report the surgeon if there is any significant bleeding occurred during that period. On their follow up visit a particular enquiry was made about any episode of bleeding or other complications.

Results:

A total of 48 patients underwent bilateral partial inferior turbinectomy over a period of 2 years. Patients were equally divided into 2 groups randomly; Group-A had surgery done in a traditional fashion while group-B underwent turbinectomy using a clamp to crush the cut end of the turbinate. The age of patients varied from 16 to 47 years, 27 of these patients (56%) were male while 23 (44%) were females. However the age and gender ratio data did not carry any significance in this study.

The average time taken by surgeon to perform turbinectomy in group-B was 12-14 minutes

Table 1: *Comparison of operating time and intra-operative blood loss*

	Group –A (n=24)	**Group – B (n=24)**
Operating time in minutes	20-25	12-14 (56% less than Group-A)
Intra-operative blood loss	75 cc	25 cc (33% less than Group-A)

Table 2: *Comparison of hospital stay*

	Group –A (n=24)	**Group – B (n=24)**
1 day stay in hospital	09 (37%)	21 (87%)
2 days stay in hospital	13 (54%)	03 (12.5%)
3 days stay in hospital	02 (08%)	00

Table 3: *Comparison of Post-operative Complications*

	Group –A (n=24)	Group – B (n=24)
Repacking after pack removal	14 (58%)	02
Re-admissions after discharge	03 (12.5%)	00
Bleeding in post-op period of one week	09 (37%)	04 (16%)

which was 56% less than the time consumed in group-A which was on average 20-25 minutes. This has a direct impact on the duration of anesthesia and reduced operation theatre charges. A comparison of the blood loss during surgery was made that showed that in group-A the average blood loss was 75 cc. while in group-B the average blood loss was 25 cc., this was only 33% of the group-A. (Table 1).

When hospital stays of the two groups were compared, it was seen that 87% of the group-B patients were discharged on the first postoperative day while only 37% of the patients in group-A were discharged on first day. 54% of the patients in group-A were discharged on second day while 2 patients in the same group had a 3 day stay in hospital (Table 2).

After pack removal on first day, 58% of the group-A patients needed to have a pack reinserted because of severe bleeding and 2 of the patient in group-B needed to have pack reinserted after its removal. 3 patients out of 24 in group-A were readmitted to the hospital after being discharged home because of uncontrolled bleeding, while none of the patient in group-B needed readmission. When inquired on follow up visit after surgery, 37% of the patients in group-A complained of episodic bleeding while at home although it was not severe enough needing report, while only 16% of the patients in group-B had this complain. (Table 3)

Discussion:

Prolonged persistent nasal obstruction resulting from inferior turbinate hypertrophy (ITH) is a common complaint encountered in the rhinology practice. The inferior turbinates play a major role in the regulation of nasal airflow and development of nasal obstruction. Surgical turbinate reduction, either alone or as an adjunctive procedure during septoplasty, rhinoplasty or sinus surgery is often performed in patients after unsuccessful medical management of ITH.

Inferior turbinate reduction can be performed by various techniques that resect, displace or decrease the volume of the turbinate. The goals of surgery are to maximize the nasal airway, to preserve the nasal mucosal functions and to minimize the complications. The inferior turbinates are very vascular structure owing to their important physiological role of regulation of the inspired air. One of the risks of surgery is hemorrhage; patients with coagulopathies are clearly at increased risk of complication.

The surgical management of the enlarged turbinate has been actively debated for more than a century. Inferior turbinate surgery dates back to the 1980s when Jones first described it. In the early 1900s most surgeons advocated inferior turbinectomy. In 1900 Holmes described the stages of ITH and his surgical experience with 1500 turbinectomies. The procedure went out of fashion because of the concerns over the risk of post-operative hemorrhage, crusting & atrophic rhinitis [4].

The surgery of the inferior turbinate has transformed tremendously over the time. It has ranged from turbinate resection (total or partial turbinectomy) to the outfracturing, electrocautery, submucous diathermy, cryotherapy, submucosal resection and laser cautery. [5,6] A new addition to this armamentarium is the shaver assisted endoscopic turbinectomy using a microdebrider that has shown successful results with even fewer complications.[3,7]

Despite this development and advancement in the surgical techniques, the partial inferior turbinectomy is still widely performed surgery in our clinical practice due to various reasons. Although concerns have been shown over the complications of this surgery, studies of these long-term methods show a variable long-term success and incidence of complications.[2]

A standard practice is to perform partial rather than total inferior turbinectomy. The technique involves fracture of the turbinate bone toward midline and cutting along its lateral attachment. This can be done with a head-light or with endoscopic visualization[8]. In a study done by N. Qureshi, patients undergoing inferior turbinectomy were followed up for a period of six months post-operatively and 95% of the patients showed relief in the symptoms of nasal obstruction and postnasal drip[9]. Although partial inferior turbinectomy is one of the most rewarding surgery in terms of relief of symptoms[10], this surgery is often associated with a high risk of intraoperative and post-operative hemorrhages. However various studies have shown minimal incidence of bleeding, crusting and atrophic rhinitis, even in dry, dusty climates.[11,12] Passali and colleagues randomized 382 patients with symptomatic ITH into six groups and found that those patients who underwent partial of total inferior turbinectomy experienced good long-term relief of nasal obstruction but also had a significantly higher percentage of crusting and bleeding compared with patients who underwent laser surgery, electrocautery, cryotherapy or submucosal resection.[13]

The factor of bleeding accounts for increased intra-operative time, need to keep the pack for long duration and sometimes need to reinsert the pack after removal, increased stay and sometimes re-admission to the hospitals. These complications often preclude a surgeon to perform this surgery. The authors advocate a modification of this technique by applying a long hemostat to crush the cut end of turbinate before resection. This technique, although described in literature[14] but is not widely practicized because of lack of any study describing its benefits and advantages.

The current prospective randomized comparison has clearly demonstrated advantages of this technique over the standard technique. The operating time in group-B was 56% less than the group-A patients. The blood loss in group-B was 33% less than the patients in group-A.(Table I) A significant reduction in the hospital stay of the patient was noted; 87% in group-B had one day hospital stay as compared to only 37% in group-A patients, 54% of the patients in group-A had hospital stay of 2 day as compared to 12.5% in case of group-B, whereas 8% of the patients in group-A had a hospital stay of 3 days (Table II). This clearly shows a significant reduction in the hospital stay in group-B patient hence reducing the overall expanses as well. Another important factor we analyzed was the need to repack after pack removal, need to re-admit patient to hospital after discharge and bleeding. During surgery it was clearly more in group-A patients; 62%, 12.5% and 37% respectively as compared to group-B patients as shown in Table III.

Conclusion:

Bilateral partial inferior turbinectomy is a very common procedure performed in ENT practice. The high incidence of primary or late hemorrhage often precludes a surgeon to perform this. The modified technique utilizing a clamp to crush the cut end before surgery as described in this article clearly demonstrate its advantages over the standard technique in terms of shortened operation time, reduction in blood loss and less incidence of post-operative complications and need to repack or readmit after discharge. This technique clearly reduces the hospital stay hence curtail overall expanses. This technique is very safe, easy to apply, doesn't need any expensive or sophisticated instrument and is recommended for turbinectomy in every case.

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