

The Impact of Lateral Osteotomy during Septorhinoplasty in Correcting Traumatic External Nasal Deformity

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Received Date: October 03, 2024; **Published Date:** October 29, 2024

Abstract

Nasal bone fractures are the maximum among facial injuries. Correction of nasal bone deviation is often incomplete and may result in unsuccessful surgery. Various surgical procedures have been described to treat these fractures with varying results. Lateral osteotomies are the basis of rhinoplasty surgeries and involve the nasal and maxillary bones to narrow or widen the nasal dorsum and base. The ideal nasal osteotomy should provide precise, predictable, and reconstructive esthetics and function while minimizing soft tissue injury and complications in the postoperative period. Different osteotomy positions and methods are lateral, intermediate, medial, and superior/lateral. Here, we present a case of external nasal deformity injury that we successfully treated with lateral osteotomy during septorhinoplasty with satisfying surgical outcomes.

Keywords: Nasal Bone; Nasal Pyramid; Septorhinoplasty; Osteotomy

Introduction

It is reported that nasal bone fractures are the maximum among facial injuries and the 3rd most common bone fracture in the human body. The supporting bones of the nose have two nasal bones, which are connected to the frontal bone at the top and the frontal process of the maxillary bone laterally. The ascending part of the maxillary bone together with the nasal bone forms the nasal vault, which forms the upper third of the nose and provides support to the cartilage structures that make up the rest of the nose due to its central location; the nose plays an important role. The role of the face in beauty aesthetics, any change in its appearance is exposed to criticism [1]. Correction of the bony nasal deviation that has persisted for a long time after injury is one of the most difficult and unpredictable aspects of facial surgery. Posttraumatic nasal bone deviation treatment aims

to achieve a smooth, straight, and properly shaped face while preserving or improving the airway [2].

Rhinoplasty surgeons vary in their choice of osteotomy instrumentation, timing, and technique [3]. Lateral osteotomy is the main part of the rhinoplasty procedure because it can solve different problems such as closing the roof after the dorsal hump is removed, narrowing the nasal bone, straightening the nasal bones, and correcting nasal wall asymmetry [4]. Closed reduction of the nasal bone fracture is a simple procedure. The results of the reduction are difficult to predict. In some cases, better surgery can be achieved by performing rhinoplasty and open reduction simultaneously [5]. In our case of traumatic external nasal deformity, we successfully repaired the external nasal deformity with lateral osteotomy during septorhinoplasty.

Case Report

A 25-year-old male patient complained of external nasal deformity and bilateral nasal obstruction for 10 days. The patient had a history of trauma 10 days back. There was also history of pain and one episode of nasal bleeding at the time of trauma. The patient had no history of fever, loss of consciousness, and seizure. The patient also revealed that he had had an accident a few years back and he had suffered nasal injury at that time but he did not take any treatment. On local

examination, there was a C-shaped external nasal deformity towards the right side, mild swelling but no erythema, or previous scar marks. On palpation, there was no crepitus but tenderness over the nose's dorsum. On anterior rhinoscopy, there was DNS to left with right ITH with congested nasal mucosa and no septal hematoma or abscess. The rest of the ear and throat examination was normal and no abnormality was detected (Figure 1).



Figure 1: Preoperative photographs of the patient showing C-shaped external nasal deviation towards right side.

DNE was done and the findings were confirmed which were similar to anterior rhinoscopy. Non-contrast CT of the paranasal sinus (NCCT PNS) was done and it revealed a deviated nasal septum to the left with a sharp spur and right ITH and bilateral displaced fracture of nasal bones (Figure 2).

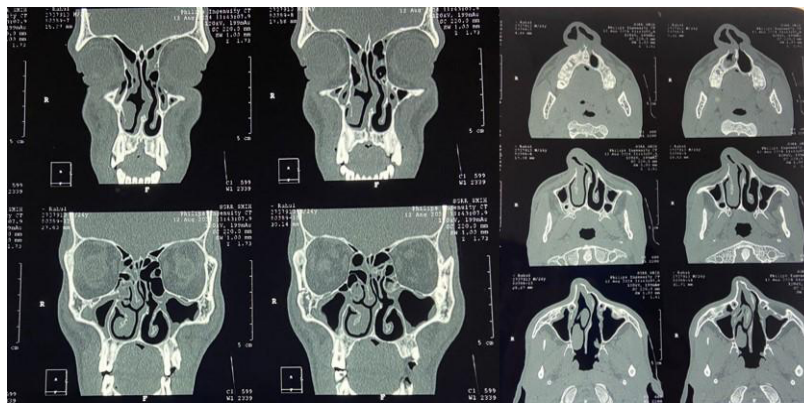


Figure 2: NCCT PNS. a) Coronal cuts showing DNS to left with right ITH. and b) Axial cuts showing deviated septum and nasal pyramid with displaced fracture of nasal bones.

Based on the above findings septorhinoplasty with fracture nasal bone reduction and inferior turbinate reduction under GA was planned. 1: 100,000 diluted adrenaline was infiltrated in the bilateral nasal septum and floor. Bilateral mucoperichondrial and mucoperiosteal flaps were

elevated. A deviated part of the nasal septum, broken bone and cartilage pieces, and a spur were identified and removed. A nasal endoscopy was then done to assess the nasal dimensions.

For the right lateral osteotomy, a stab incision is made with a knife into the nasofacial skin of the nose. A sharp osteotome was then placed on the incision at the mid portion of the bony nasal pyramid and right lateral osteotomy was done. Similarly, left-side lateral osteotomy was also done. Reduction and realignment of the nasal pyramid was then done. Right

partial inferior turbinectomy was done and septal incision was sutured. Bilateral anterior nasal packing was done. POP cast and Bolster were applied. The patient was extubated and shifted to the post-operative recovery room (Figure 3).

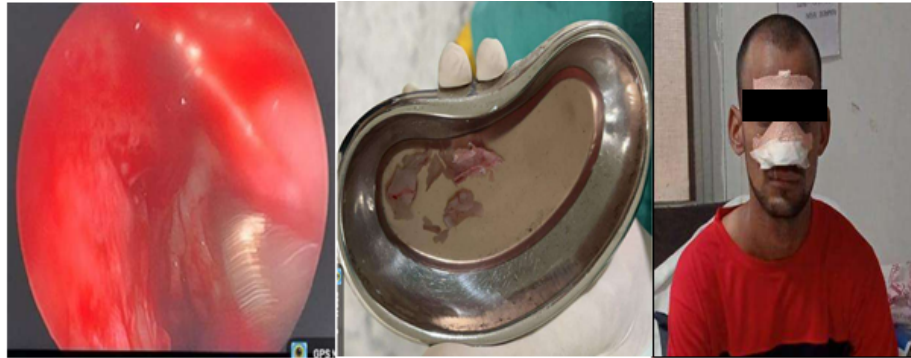


Figure 3: Intraoperative picture showing a) endoscopic picture of nasal cavity after reduction of the nasal bone. b) Pieces of bones and cartilage after septoplasty. c) Post-op photograph showing nasal POP cast with bolster.

Bilateral anterior nasal packs were removed on day 3. Suction and clearance were done and discharged on day

6. The patient was followed up after 7 days for POP cast removal (Figure 4).



Figure 4: Post-operative photograph after 2 weeks showing a) front view of patient b) Base view of patient.

Discussion

The fracture of the nasal bone is more common in males than females. A traffic accident is the most common cause followed by falling showed in the study by Davari R, et al. [6]. This epidemiology was similar to our case. Nasal bone fractures are the maximum among facial injuries and can be managed by closed or open reduction. The study done by Rhee SC, et al. [7] showed a 30 to 40 percent failure

rate in nasal manipulation operations and the incidence of post-reduction nasal deformities requiring subsequent rhinoplasty or septorhinoplasty ranged from 14 to 50 percent and that 46.9 percent of nasal bone fractures are combined with septal fracture. In our case, we performed septoplasty along with rhinoplasty for better results. Murray JA, et al. [8] showed in the cadaver studies, that the cause of the late deviation is due to a C-shaped fracture occurring in the bony and cartilaginous septum, the edges of which interlock and

drag the mobile nasal bone fragments toward their initially displaced position. At the time of operating on the septum manipulating the nasal bones and freeing the interlocking fragments is the best concept. Veredi P, et al. [9] describe that lateral osteotomy is usually performed to narrow a wide nasal base, widen a narrow nasal base, straighten deviated nasal bones, or close an open roof deformity.

Nasal osteotomies can be defined as external (lateral percutaneous dotted osteotomy) or internal, based on the used approach. In our case also lateral osteotomy was done to straighten the deviated nasal dorsum. By nature, osteotomy is a technique prone to inconsistency, as bones are at risk of fracturing uncontrollably along points of weakness or if too much force is applied [10]. In our case, we didn't encounter any such complications. Fear of people 'breaking bones' with mallet and hammer, and osteotomy is the main cause that patients avoid rhinoplasty. Avoiding the swollen and bruised 'traumatized' appearance in the postoperative period is certainly an advantage in terms of quality of life and reduced surgical downtime [11].

Similar to our case, Locketz GD, et al. [3] also showed that the percutaneous approach feels that it provides more direct visualization of the path of the desired osteotomy, reduces the incidence of damage to vestibular mucosa, preserves the periosteal attachments of the nasal bones with increased support and reduced anatomical dead space and reduces the incidence of flail segment of the fractured bone. There may be problems that need to be reported, such as facial edema and other injuries that occur immediately after the injury, which make it difficult to detect nasal deformities.

There are now aesthetic and functional problems in the nasal bones, and if these difficulties are ignored, patients will need longer hospital stays and more expensive treatments in addition to the treatment period. If the patient desires aesthetic improvement and the outcome of closed reduction is not satisfactory, concomitant open reduction and rhinoplasty can be performed during primary treatment to avoid secondary surgery, thus optimizing the costs [5]. Once the swelling and edema of the face and nose region subsided in our case, we performed septoplasty and then osteotomy and dorsal correction.

The bias measurements used in the experiment are difficult to interpret. Photographic measurement is not well defined, and radiology of nasal fractures gives unacceptable results for the study. Other methods for measuring facial asymmetry include Moiré topography and Photography, but these methods have not yet been clinically accepted. In our case, we use photographs and CT to measure the deviation. The pre- and postoperative views are presented as well (Figures 5). The postoperative healing was good. The airway of the patient was improved and the nose showed correction of the

nasal bone deformity and improved symmetry.



Figure 5: Showing the photographs of post- and pre-operative appearances. a) frontal view b) right lateral view.

Conclusion

Nasal bone fractures are the maximum among facial injuries and can be treated with closed or open reduction. Rhinoplasty surgeons should be aware of the wide variety of nasal osteotomy techniques, as well as the indications for each of their applications based on preoperative assessment. Recognition of these factors helps to achieve favorable rhinoplasty results and prevents postoperative iatrogenic nasal airway obstruction. We hope that this case study will inform rhinoplasty surgeons and improve their ability to perform external osteotomies safely and effectively.

Ethics Approval

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

Consent to Participate

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

Author's Contribution

Pandey AK: Concept, literature search, manuscript editing and review,

Anjum F, Nautiyal S: Manuscript writing and editing,

Jindal M, Nagpal A, Jain S: Data acquisition,

All authors read and approved the final manuscript.

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