# CASE STUDY – SCHOLARSHIP IBRA PROGRAM B SCHOLARSHIP CENTER: CHU AMIENS-PICARDIE FRANCE SCHOLAR NAME: FRANCESCO S MANNARINO

# NASAL TRAUMA: SECONDARY RECONSTRUTION WITH OPEN RHINOPLASTY

Keywords: Nasal reconstruction, nasal trauma, open rhinoplasty

### Summary

Due to the prominent location of the nose, the most common facial traumas are nasal injuries. A 42-year-old man was referred from the maxillofacial surgery outpatients service from the University hospital center in Amiens - Picardie, Northern France is presented. He asked for both aesthetic and functional corrections. The patient had a fall after feeling unsteady, which caused a direct nasal injury 2 years ago. Clinical examination revealed septal fracture with obstruction of the left nasal cavity and deformity of the nasal pyramid. The patient also had a complete dissection of the columella skin. Surgical intervention included septal reconstruction combined with restoration of the nasal pyramid and columella. One month later, the patient had patent nasal airways, and he was satisfied with the aesthetic result.

# Introduction

Due to its prominent position, the nose is the most frequently injured part of the face  $(\underline{1},\underline{2})$ . Even minor nasal traumas may result in significant aesthetic and/or functional defects ( $\underline{2}$ ). The current management for the majority of nasal injuries is closed reduction of

nasal fractures and, if required, a second operation at a later time. Additionally, patients tend to avoid a second operation despite a nonacceptable aesthetic and/or functional result (3). The present case describes a trauma that requires a more sophisticated operation than a simple manipulation of nasal bones. The primary management of such fractures are often difficult because of the presence of edema (4). However, the best healthcare scenario would be the patient receiving the proper nasal correction in the first hours after trauma, even before the edema. We present a case of an inverted V deformity caused by nasal injury as an indication for secondary reconstruction with an open approach.

#### Case presentation and Management-Outcome

A 42-year-old man was admitted to the wards of Universitary Hospital Center of Amiens – Picardie in the Northern France, at the Department of Maxillofacial surgery and Stomatologie, seeking help for nasal obstruction and breathing difficulties. The patient had no other complaints except for left-side nasal obstruction. He had no family history or past medical history and was in good physical and mental health. The patient's complaint was due to a history of a fall on a rigid metallic surface at his work 2 years ago, which caused the nasal deformity. (FIGURE 1) The nasal trauma consisted of complete separation of the bony vault from the cartilaginous vault (inverted V deformity), a vertical fracture of the cartilaginous nasal septum with mucosal laceration causing complete obstruction in the left nasal cavity and a skin laceration at the level of the nasal columela.



**FIGURE 1: A** Front view of the columella injury and the inverted V deformity. **B** Post-op 1 month

An open rhinoplasty approach under general anesthesia was performed through the open wound of the columella. After identification of the osseocartilaginous separation, the cartilaginous vault was manipulated with a long nasal speculum to approach the level of the bony vault and secured with three nonabsorbable sutures (white Gore-tex 3.0 [WL Gore & Associates Inc, USA]) – one in the midline at the level of the nasal septum passing through the bone, and one laterally on each side between the upper lateral and the periosteum of the nasal bones.



**FIGURE 2:** Schematic drawing of the nasal reconstruction with sutures between the osseous and cartilaginous vaults and sutures for strengthening and repositioning of the columella

Intercartilaginous sutures were used for the reconstruction of the fracture of the quadrangular septal cartilage posteriorly along with sutures securing the mucosal flaps (Vicryl 4.0, Ethicon, Johnson & Johnson Medical Limited, UK). The stability of the nasal tip required additional sutures between the medial crura of the lower cartilages and the caudal end of the quadrangular cartilage, along with a suture for the repositioning of the septum on the maxillary crest anteriorly (FIGURE 2). Finally, after careful removal of the necrotic tissue, skin lacerations were approximated with interrupted nonabsorbable sutures (nylon 6) and the columella was covered without any use of a skin graft. During the operation, no cartilaginous graft was harvested because the open wound trauma had the potential risk of an infection and graft resolution. Nasal packing and silicone splints were placed and remained in the nose for 10 days under antibiotic treatment. External bandaging of the nose was finally undertaken, ensuring excessive pressure was not applied to the columella skin. The patient had an uneventful recovery without complications postoperatively. In a follow-up appointment one month later, the patient had an acceptable aesthetic result with a patent nose on both sides. After the operation, the patient remained in the wards for more 1 day before leaving the hospital.

#### DISCUSSION OF CASE

The current management in the majority of nasal injuries worldwide is closed reduction and, if required, a second operation at a later time. Indications for performing a rhinoseptoplasty include nasal obstruction, sleeplessness, and snoring. The most prevalent indication is a persistent nasal obstruction that does not respond to medical treatment (5). Unfortunately, no objective criterion can be used to separate individuals who will react to medicinal treatment without requiring surgical intervention from those who will not respond to medical therapy and will need rhinoseptoplasty (6). Additionally, the physiological impact and personal happiness may encourage rhinoseptoplasty if symptoms are present (7). Thus, determining which individuals may benefit from rhinoseptoplasty clinically needs synthesizing several physical examination results rather than relying on one or two such findings. Multiple studies have analyzed the impact of rhinoseptoplasty on a patient's life (8, 9). These studies show that patients benefit from an increased quality of sleep and concentration and that symptoms such as a runny nose, nasal obstruction, and fatigue are resolved (8).

In our case, the patient complained of nasal deviation with nasal obstruction and breathing difficulties. In addition, the patient was blind, which could affect the decision to perform surgery. We decided to proceed because the patient desired and consented to have the surgery. Furthermore, during the follow-up, he said he felt happy, comfortable, and more confident, enhancing his quality of life. Does rhinoseptoplasty improve a patient's quality of life? Yes, if it is performed in individuals with moderate-to-severe symptoms or if it improves the patient's psychological condition (10). However, the patient's happiness and confidence play a significant part in deciding whether to perform the procedure to improve their quality of life.

If dealing with nasal skin defects, grafts or flaps should rarely be used, and only be used if they are absolutely necessary in an open trauma wound because the potential risk of infection is significantly increased (<u>11</u>). Columella is a tricky subunit to repair because of the low availability of neighbouring skin (<u>12</u>); in a study by Sherris et al (<u>13</u>), only one of 16 patients with columella defect due to trauma was operated with the use of a local flap. In complex wounds, the aesthetic result should be judged at a later time. In cases of unsatisfactory wound healing, a second skin flap or free graft reconstruction can be performed. (<u>11,13</u>)

Although an early rhinoplastic procedure does not often seem to be a first-line procedure, in the long term, it is more effective for the patient and the health care system because it avoids a significant number of secondary operations. Rhinoplastic techniques should be part of the training programs in the modern management of severe nasal traumas.

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IBRA – International Bone Research Association

#### REFERENCES

1. Baring D, Murray C, Singh J, Davidson A, Syed I. Prospective, blinded study of nasal injuries: Comparison of doctor and nurse assessment. *J Laryngol Otol.* 2009;123:1338–42.

2. Higuera S, Lee E, Cole P, Hollier L, Stal S. Nasal trauma and the deviated nose. *Plast Reconstr Surg.* 2007;120:64S–75S.

3. Mondin V, Rinaldo A, Ferlito A. Management of nasal bone fractures. *Am J Otolaryngol Head Neck Med Surg.* 2005;26:181–5.

4. Huizing E, De Groot J, editors. *Acute Nasal Trauma in Functional Reconstructive Nasal Surgery.* New York: Thieme Publishers; 2003.

5. Maniglia CP, Maniglia JV: Rhinoseptoplasty in children. Braz J Otorhinolaryngol. 2017, 83:416-419. 10.1016/j.bjorl.2016.04.019

6. Rudy S, Moubayed SP, Most SP: Midvault reconstruction in primary rhinoplasty . Facial Plast Surg. 2017, 33:133-138. 10.1055/s-0036-1598016

7. Peleman JR, Chung MT, Johnson J, et al.: Surgical adjuncts to rhinoplasty: an algorithmic approach . Aesthetic Plast Surg. 2020, 44:1694-1704. 10.1007/s00266-020-01744-9

8. Rabaioli L, Oppermann PO, Pilati NP, Klein CF, Bernardi BL, Migliavacca R, Lavinsky-Wolff M: Evaluation of postoperative satisfaction with rhinoseptoplasty in patients with symptoms of body dysmorphic disorder. Braz J Otorhinolaryngol. 2022, 88:539-545. 10.1016/j.bjorl.2020.07.013

9. Brucoli M, Baena RR, Boffano P, Benech A: Psychological profiles in patients undergoing orthognathic surgery or rhinoplasty: a preoperative and preliminary comparison. Oral Maxillofac Surg. 2019, 23:179-186. 10.1007/s10006-019-00758-1

10. Hytönen ML, Lilja M, Mäkitie AA, Sintonen H, Roine RP: Does septoplasty enhance the quality of life in patients?. Eur Arch

Otorhinolaryngol. 2012, 269:2497-2503. 10.1007/s00405-012-1931-9

11. Guida R, Rubach B. Aesthetic restoration of acquired nasal defects. *Oper Tech Otolaryngol Head Neck Surg.* 2000;11:102–9.

12. Harrison DH. Nasal injuries: Their pathogenesis and treatment. *Br J Plast Surg.* 1979;32:57–64.

13. Sherris D, Fuerstenberg J, Danahey D, Hilger P. Reconstruction of the nasal columella. *Arch Facial Plast Surg.* 2002;4:42–6.