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Original Research Article.

Retrospective Analysis of Closed Reduction of Nasal Bone Fracture: An Institutional Based Study

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ABSTRACT

Background: The fractures of the nasal skeleton are among the most common facial fractures. The present study was conducted to assess Closed Reduction of Nasal Bone Fracture retrospectively.

Materials & Methods: The present study was conducted among 130 outpatients and emergency patients. Patients' demographic data, cause of fracture and postoperative complications were reviewed. The patients were followed-up for at least three months to assess the complications, such as fracture recurrence and functional abnormality.

Results: In the present study 130 patients were selected retrospectively. Out of 130 patients 74.61% were males and 25.38% were females. Among both males and females, Type IIA fracture was common followed by Type I. The most common cause of trauma was slip down (35.38%) followed by collision (17.69%). Among early complications esthetic deformity (n=7) was most common followed by pain (n=6). Early complications were common in IIB trauma (n=6) followed by type III (n=5). Among late complications esthetic deformity (n=5) was most common followed by pain (n=3). Late complications were common in IIBs trauma (n=4) followed by type IIA and type IIB respectively (n=2).

Conclusion: The study concluded that after closed reduction of nasal bone fracture both early and late complications were present. In both early and late complications esthetic deformity was most common. Early complications were common in IIB trauma and late complications were common in IIBs trauma.

Keywords: Nasal Fracture, Complications, Closed Reduction.

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INTRODUCTION

The nasal bone is the most protruding bony structure of facial bones, making it susceptible to impact. Thus, nasal bone fracture is the most common facial bone fracture, accounting for about 40% of all facial fractures. It is the third most common fracture of all bone fractures. This is due to the fact that, in addition to being the most protruding facial bone, it is composed of thin membranous bone and therefore has low breaking stress.[1] If proper treatment is not provided at an appropriate time, nasal bone fracture may cause not only a change in facial contouring but also complications in the upper airway[2], and septoplasty or augmentation rhinoplasty could be required due to the patients' low functional and aesthetic satisfaction. For nasal bone reduction, general or local anesthesia, open or closed reduction, and the time elapsed until operation after fracture should be considered. These factors may affect patient satisfaction or complications. In the case of non-complex nasal bone fracture, closed reduction under systemic anesthesia is conventionally known to be effective.[3] Accurate initial treatment after diagnosis, including closed reduction if indicated, is essential to prevent deformity and functional impairment.[4]

Closed reduction of the nose is generally safe and easy to perform, and morbidity is minimal. In those patients who do not achieve satisfactory results, open reduction and traditional septorhinoplasty can be performed at a later date. The goal of treatment is to restore the appearance and function of the nose to their pretrauma state. It is generally accepted that the final result of treatment cannot be properly evaluated until I or 2 years have passed since treatment. The reason is that both the trauma and the reduction might cause fibrosis that can lead to a secondary deformity of the nasal pyramid.[5] The present study was conducted to assess Closed Reduction of Nasal Bone Fracture retrospectively.

MATERIALS & METHODS

The present study was conducted among 130 outpatients and emergency patients. Patients who had been diagnosed with nasal bone fracture via physical examination, plain radiograph, and computed tomography were selected retrospectively. Patients' demographic data, cause of fracture and postoperative complications were reviewed. Patient information including complications was collected via the patients' medical records. Those with a previous history of nasal bone fracture or who had undergone septoplasty, augmentation rhinoplasty, or corrective rhinoplasty were excluded from the study. After computed tomography, Hwang *et al*.'s classification method (2006)[6] was used to evaluate the fracture severity based on the deviation or depression degree and the concurrent fracture of the septal bone. Accordingly, the patients were classified according to the following six groups: type I – simple, without displacement; type II – simple, with displacement/without telescoping (IIA – unilateral, IIAs – unilateral with septal fracture, IIB – bilateral, IIBs – bilateral with septal fracture); and type III – comminuted with telescoping or depression. All patients except for the type I group underwent closed reduction with external nasal splinting under systemic anesthesia. Pre- and post-operative plain films were obtained from all patients. After surgery, gauze packing and external nasal splinting were maintained for four and seven days, respectively. The patients were followed-up for at least three months to assess the complications, such as fracture recurrence and functional abnormality.

RESULTS

In the present study 130 patients were selected retrospectively. Out of 130 patients 74.61% were males and 25.38% were females. Among both males and females, Type IIA fracture was common followed by Type I.

The most common cause of trauma was slip down (35.38%) followed by collision (17.69%). Among early complications esthetic deformity (n=7) was most common followed by pain (n=6). Early complications were common in IIB trauma (n=6) followed by type III (n=5).

Among late complications esthetic deformity (n=5) was most common followed by pain (n=3). Late complications were common in IIBs trauma (n=4) followed by type IIA and type IIB respectively (n=2).

Table 1: Distribution of patients according to gender

Gender	Type I	Type IIA	Type IIAs	Type IIB	Type IIBs	Type III	Total (%)
Male	20	29	8	15	13	12	97(74.61%)
Female	10	12	2	3	0	6	33(25.38%)
Total	30	41	10	18	13	18	130(100%)

Table 2: Distribution of patients according to cause of trauma

Cause of trauma	Type I	Type IIA	Type IIAs	Type IIB	Type IIBs	Type III	Total (%)
Slip down	11	15	4	6	5	5	46(35.38%)
Fall down	2	2	2	2	2	2	12(9.23%)
Fist trauma	3	10	1	3	2	3	22(16.92%)
Collision	8	4	1	4	2	4	23(17.69%)
Traffic accident	5	7	1	1	2	2	18(13.84%)
Others	1	3	1	2	0	2	9(6.92%)
Total	30	41	10	18	13	18	130(100%)

Table 3: Early complications after closed reduction

Early complications	Type IIA	Type IIAs	Type IIB	Type IIBs	Type III	Total
Esthetic deformity	2		4	1		7
Hyposmia				1	1	2
Hypoesthesia		1			1	2
Obstruction			1			1
Pain	2		1		3	6
Total	4	1	6	2	5	18

Table 4: Late complications after closed reduction

Early complications	Type IIA	Type IIAs	Type IIB	Type IIBs	Type III	Total
Esthetic deformity	1		1	3		5
Hyposmia						
Hypoesthesia						
Obstruction						
Pain	1		1	1		3
Total	2		2	4		8

DISCUSSION

The restoration of pretraumatic form and function is the goal of closed nasal reduction.[7] Even though this surgical intervention is considered a straightforward procedure, the incidence of postreduction nasal deformity requiring open revision rhinoplasty is as high as 14 to 50 per cent, according to Rohrich and Adams.[8]

In the present study 130 patients were selected retrospectively. Out of 130 patients 74.61% were males and 25.38% were females. Among both males and females, Type IIA fracture was common followed by Type I. The most common cause of trauma was slip down (35.38%) followed by collision (17.69%). Among early complications esthetic deformity (n=7) was most common followed by pain (n=6). Early complications were common in IIB trauma (n=6) followed by type III (n=5). Among late complications esthetic deformity (n=5) was most common followed by pain (n=3). Late complications were common in IIBs trauma (n=4) followed by type IIA and type IIB respectively. (n=2).

Park HK et al investigated the therapeutic effect of closed reduction according to a classification in patients with nasal bone fracture. Results of nasal bone closed reduction on the 186 patients showed that serious complications rarely occurred. Closed reduction is generally an effective treatment for nasal bone fracture. However, in the case of severe concurrent septal bone fracture or comminuted fracture with depression, open reduction should be considered.[9]

Ridder GJ et al conducted a retrospective clinical review of 187 patients who were evaluated for nasal trauma (including nondislocated fractures, dislocated fractures, and contusions and concluded that closed reduction is a safe procedure for isolated nasal fractures and can be performed with local anesthesia in most adult patients. Morbidity is minimal in the hands of an experienced ENT surgeon.[10]

According to Chung *et al*.[11], long-term follow-up should be required after surgery on nasal bone fracture, for the following reasons. First, because the nose is covered with thin soft tissues without muscles for reconstruction of the bone, fibrosis, scar formation, and contracture frequently occur during treatment.[2] Second, it is difficult to set the standard of satisfaction evaluation. Third, the treatment goal is not always clear. Fourth, due to the complex anatomical structure, the clinical manifestations and surgical method vary depending on the adjacent anatomical structures.[12]

CONCLUSION

The study concluded that after closed reduction of nasal bone fracture both early and late complications were present. In both early and late complications esthetic deformity was most common. Early complications were common in IIB trauma and late complications were common in IIBs trauma.

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