

Original Research Article

# CLINICODEMOGRAPHIC PROFILE AND MANAGEMENT OF NASAL BONE FRACTURES: A RETROSPECTIVE STUDY AT A TERTIARY CARE HOSPITAL

A.S.Aruna Kumari <sup>1</sup>, Kedam Shilpa Rani <sup>2</sup>, Akshaya S <sup>3</sup>, Hareshwar Sai Chandan Moturu <sup>4</sup>, S Raviprakash Reddy <sup>5</sup>, Uradi Shradha<sup>6</sup>

<sup>1</sup>Professor &HOD, Department of Otorhinolaryngology(ENT), Government Medical College, Suryapet, Telangana, India.

<sup>2</sup>Assistant Professor, Department of Otorhinolaryngology(ENT), Government Medical College, Suryapet, Telangana, India.

<sup>3</sup>Senior Resident, Department of Otorhinolaryngology(ENT), Government Medical College, Suryapet, Telangana, India.

<sup>4,5,6</sup>Postgraduates, Department of Otorhinolaryngology(ENT), Government Medical College, Suryapet, Telangana, India

Received : 13/04/2026  
Received in revised form : 03/06/2026  
Accepted : 18/06/2026

**Corresponding Author:**

**Dr. Kedam Shilpa Rani,**  
Assistant Professor, Department of  
Otorhinolaryngology(ENT),  
Government Medical College,  
Suryapet, Telangana, India.  
Email: kedam.shilpa@gmail.com

DOI: 10.70034/ijmedph.2026.2.630

Source of Support: Nil.

Conflict of Interest: None declared

**Int J Med Pub Health**

2026; 16 (2); 3840-3844

## ABSTRACT

**Background:** Nasal bone fractures are the most common facial skeletal fractures encountered in clinical practice owing to the prominent anatomical position of the nose. These injuries can result from road traffic accidents, interpersonal violence, sports-related trauma, falls, and occupational accidents. Prompt diagnosis and appropriate management are essential to restore nasal function and aesthetics and to prevent long-term complications such as nasal deformity and airway obstruction. Understanding the clinicodemographic characteristics and treatment patterns of nasal bone fractures can aid in optimizing patient care and resource allocation. The Objective is to evaluate the clinicodemographic profile, etiological factors, fracture patterns, clinical presentation, and management outcomes of patients with nasal bone fractures treated at a tertiary care hospital.

**Materials and Methods:** The present study is a hospital-based retrospective observational study conducted in the department of otorhinolaryngology, government medical college/government general hospital, suryapet, telangana. The retrospective component includes patients diagnosed and treated for nasal bone fractures whose records are available in the hospital database. Data regarding age, sex, mode of injury, clinical presentation, associated facial injuries, radiological findings, treatment modalities, and outcomes were collected and analyzed. Management strategies included conservative treatment, closed reduction, and surgical intervention where indicated.

**Results:** A total of 50 patients with nasal bone fractures fulfilling the inclusion and exclusion criteria will be included in the study. In our study, most commonly involved patients were males (74%) compared to females (26%), as males were more likely to be involved in sports activities and road traffic accidents. In our study, the most common age group presenting with nasal bone fracture was 21–30 years, while the least common age groups were children below 10 years and adults above 50 years. In our study, the most common cause of nasal bone fracture was road traffic accidents (58%), whereas assault-related trauma was the least common cause. The most commonly performed radiological investigation was an x-ray of the bilateral nasal bones, which was used in about 60% of cases to confirm the diagnosis. In suspected cases of associated facial bone injuries, a ct scan was performed to rule out other facial fractures. In this study, fracture reduction was performed under local anesthesia or sedation in 66% of patients and under general anesthesia in 10% of patients who were children, uncooperative under local anesthesia, or unwilling to undergo the procedure under local anesthesia..

Closed reduction was the most frequently employed treatment modality, whereas a smaller proportion required open reduction or reconstructive procedures. Most patients achieved satisfactory functional and cosmetic outcomes with minimal complications.

**Conclusion:** Nasal bone fractures predominantly affect young adult males and are most commonly caused by road traffic accidents. Early diagnosis and timely intervention contribute significantly to favorable functional and aesthetic outcomes. Closed reduction remains the mainstay of treatment for the majority of cases, while surgical management is reserved for complex or displaced fractures. The findings of this study provide valuable insights into the epidemiology and management practices of nasal bone fractures in a tertiary care setting.

**Keywords:** Nasal bone fracture, Facial trauma, Road traffic accident, Closed reduction, Maxillofacial injury, Clinicodemographic profile, Retrospective study.

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## INTRODUCTION

Treatment of nasal fractures was first recorded 5000 years ago during the early Pharaonic period in ancient Egypt. The Edwin Smith Papyrus described repositioning of deviated nasal bones with the fingers or elevators, the insertion of splints and the application of external dressings. Just as then, nasal fractures are still very common. Isolated fractures of the nasal pyramid account for about 40% of all facial fractures. Furthermore, fractures of the nasal bones are often sustained along with other fractures of the facial skeleton. Delays in management can result in significant cosmetic and functional deformity that is often a cause for subsequent medico-legal action. The management of fractures of the nose is an important part of everyday ENT practice.<sup>[1]</sup>

In childhood, accident-prone toddlers not infrequently fracture their noses as well and these are often of a greenstick nature. Compound and comminuted fractures are more common in the elderly who are prone to falls.

According to Logan m,et al, improper management of nasal fractures may result in persistent nasal obstruction, septal deviation, external nasal deformity, and long-term patient dissatisfaction, emphasizing the importance of early diagnosis and appropriate intervention.

In many cases, especially those where it is considered a minor injury, nasal bone fracture can be treated simply and within a short time through the closed reduction (CR) technique. If surgeons establish a proper surgical plan and apply appropriate surgical skills, they may obtain the best results in terms of operative time, cost-effectiveness, surgical outcome and post-operative patient satisfaction. Cook ja et al., in a retrospective clinical investigation, demonstrated that closed reduction remains an effective treatment modality for the majority of uncomplicated nasal fractures and provides satisfactory cosmetic and functional outcomes with minimal morbidity. The authors further emphasized that careful assessment of

fracture patterns plays an important role in predicting postoperative results.

As the CR technique has limitations compared to the open reduction (OR) technique in terms of the capability for sophisticated manipulations, it is necessary to select the optimal treatment technique for individual patients depending on their nasal fracture pattern. To achieve a reliable diagnosis and consistency of surgical results, it is important to classify nasal bone fractures systematically and treat them appropriately by employing a proper therapeutic algorithm.<sup>[2]</sup>

Studies from India have reported findings similar to those observed internationally. Tota and Modi reported that road traffic accidents were the most common cause of nasal bone fractures, followed by assaults and falls. Their study demonstrated that young adult males constituted the majority of affected patients and that timely closed reduction provided satisfactory functional and aesthetic outcomes in most cases. These findings reinforce the importance of prompt diagnosis, fracture classification, and appropriate management in achieving favorable outcomes.<sup>[3]</sup>

## MATERIALS AND METHODS

**Study Design:** The present study is a hospital-based retrospective observational study conducted in the Department of Otorhinolaryngology, Government Medical College/Government General Hospital, Suryapet, Telangana.

The retrospective component includes patients diagnosed and treated for nasal bone fractures whose records are available in the hospital database. The study aims to evaluate the incidence, clinical presentation, management strategies, and outcomes of nasal bone fractures.

### Methods of Collection of Data

**Sample Size:** A total of 50 patients with nasal bone fractures fulfilling the inclusion and exclusion criteria will be included in the study.

**Study Subjects:** Patients presenting to the department of otorhinolaryngology, government general hospital, suryapet, with a diagnosis of nasal

bone fracture, as well as eligible patients identified from hospital records, will constitute the study population.

**Sampling Method:** A consecutive sampling method will be employed wherein all eligible patients presenting during the study period will be recruited until the required sample size of 50 is achieved. All eligible case records available during the specified period will be reviewed.

**Data Collection Procedure:** After obtaining approval from the institutional ethics committee, data will be collected using a predesigned and pretested case record proforma.

for retrospective cases, information will be obtained from inpatient records, outpatient records, operative notes, and radiological reports.

Detailed history regarding age, sex, mode of injury, time since trauma, presenting symptoms, associated injuries, clinical findings, radiological evaluation, treatment modality, and complications will be recorded.

Patients undergoing treatment will be followed up at 1 week, 1 month, and 3 months after intervention to assess functional and cosmetic outcomes and identify any complications.

#### Statistical Analysis

The collected data will be entered into microsoft excel and analyzed using appropriate statistical software. descriptive statistics such as mean, standard deviation, frequencies, and percentages will be used to summarize the data. appropriate inferential statistical tests will be applied wherever necessary. A p-value of <0.05 will be considered statistically significant.

#### Inclusion Criteria

1. Patients of all age groups and both sexes diagnosed with nasal bone fracture.
2. Patients presenting within 21 days of nasal trauma.
3. Patients willing to participate in the study and provide informed consent.
4. Patients with complete and accessible medical records

#### Exclusion Criteria

1. Patients with nasal bone fractures associated with major facial fractures requiring multidisciplinary management.
2. Patients with significant head injury requiring neurosurgical intervention.
3. patients presenting more than 21 days after nasal trauma.
4. Patients with open nasal bone fractures with extensive soft tissue loss.
5. Patients with incomplete medical records.

## RESULTS

In our study, most commonly involved patients were males (74%) compared to females (26%), as males were more likely to be involved in sports activities and road traffic accidents. [Table 1] In our study, the most common age group presenting with nasal bone fracture was 21–30 years, while the least common age groups were children below 10 years and adults above 50 years. [Table 2]

In our study, the most common cause of nasal bone fracture was road traffic accidents (58%), whereas assault-related trauma was the least common cause. [Table 3] The most commonly performed radiological investigation was an x-ray of the bilateral nasal bones, which was used in about 60% of cases to confirm the diagnosis. in suspected cases of associated facial bone injuries, a ct scan was performed to rule out other facial fractures. [Table 5]

In this study, fracture reduction was performed under local anesthesia or sedation in 66% of patients and under general anesthesia in 10% of patients who were children, uncooperative under local anesthesia, or unwilling to undergo the procedure under local anesthesia. Most patients with nasal bone fractures sustained lateral impact injuries (70%) compared to frontal impact injuries. [Table 4 & Figure 1]

In our study, 76% of patients with nasal bone fractures were treated by closed reduction, (Figure 2) with linear non- displaced nasal bone fracture by medication. [Table 6 and Table 7]

**Table 1: Gender distribution in nasal bone fractures**

Serial no	Gender	No. of Patients (50)	Percentage (%)
1	Male	37	74
2	Female	13	26

**Table 2: Age distribution in patients of nasal bone fractures.**

Serial No	Age(years)	No. of Patients (50)	Percentage (%)
1	0-10	2	4
2	11-20	16	32
3	21-30	19	38
4	31-40	14	28
5	41-50	8	16
6	51-60	0	0
7	61-70	1	2
8	71-80	0	0

**Table 3: Causes of nasal bone fractures**

Serial No	Causes of nasal bone fractures	No. of Patients (50)	Percentage (%)
1	Road traffic accident	29	58
2	Sports injury	12	24
3	Assaulted trauma	9	18

**Table 4: Impact of the injury in nasal bone fracture patients.**

Serial No	Types of impact	No. of Patients (50)	Percentage (%)
1	Lateral impact	35	70
2	Frontal impact	15	30

**Table 5: Diagnosis by radiological investigation.**

Serial No	Parameters	No. of Patients (50)	Percentage (%)
1	CT scan	12	24
2	X-ray	30	60
3	CT scan+ X-ray	8	16

**Table 6: Treatment given.**

Serial No	Treatments	No. of Patients (50)	Percentage (%)
1	Closed nasal bone fracture reduction	38	76
2	Medical treatment or conservative treatment	12	24

**Table 7: Closed reduction under anaesthesia.**

Serial No	Closed reduction under	No. of Patients.	Percentage (%)
1	General anaesthesia	5	13
2	Local anaesthesia	33	87

## DISCUSSION

Park et al,<sup>[4]</sup> reported that nasal bone fractures were more commonly seen in young adult males, which is consistent with our findings where males constituted 74% of cases and the most affected age group was 21–30 years. The higher incidence among young males in both studies may be explained by greater exposure to road traffic accidents, sports-related injuries, and occupational trauma.

The retrospective study by park et al,<sup>[4]</sup> also emphasized that closed reduction remains the standard and most effective treatment for displaced nasal bone fractures. Similarly, in our study, 76% of patients were managed successfully with closed reduction, demonstrating that early intervention with closed reduction provides satisfactory functional and cosmetic outcomes in the majority of cases.

Regarding the mechanism of injury, our study found lateral impact injuries to be more common than frontal injuries. This observation correlates with the anatomical vulnerability of the nasal bones described in previous literature, including the biomechanical concepts explained by nahum am, who stated that lateral forces more frequently produce displacement and fracture due to the thin and projecting structure of the nasal bones.<sup>[5-8]</sup>

Our findings on radiological investigations are also supported by the study conducted by logan m et al., who concluded that plain nasal bone radiographs have limited but useful value in isolated nasal trauma, while CT scan should be reserved for suspected associated facial fractures. In the present study, x-ray bilateral nasal bone view was commonly used, whereas ct scan was performed selectively in suspected complex facial injuries.

The preference for local anesthesia in fracture reduction observed in our study is comparable with the studies by courtneymj et al. and khwaja s et al,<sup>[9]</sup> who reported that local anesthesia is a safe, effective, and economical method for nasal fracture reduction in cooperative patients. In our study, 66% of reductions were performed under local anesthesia or sedation, while general anesthesia was reserved mainly for children and uncooperative patients.<sup>[10]</sup> Thus, the present study findings are in agreement with previously published literature and reinforce that nasal bone fractures predominantly affect young adult males, road traffic accidents remain a major etiological factor, and closed reduction under local anesthesia continues to be an effective treatment modality in most patients.

## CONCLUSION

Nasal bone fractures are one of the most common facial injuries, predominantly affecting young adult males, with road traffic accidents being the leading cause. Lateral impact injuries were more frequently observed than frontal injuries. Plain radiography was sufficient in most cases, while CT scan was useful in suspected associated facial fractures. Closed reduction remained the most effective and commonly performed treatment modality, with most procedures successfully carried out under local anesthesia or sedation. Early diagnosis and timely management provide satisfactory functional and cosmetic outcomes and help minimize complications associated with nasal bone fractures.

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