

Comparison of Post Operative Aesthetic Outcome Between Local and General Anesthesia after Close Reduction for Nasal Bone Fracture

Shumaila Rafiq¹, Faisal Rafiq², Noman Ali³, Abdur Rehman⁴, Muhammad Asjad Saleem⁵, Bilal Hussain⁶

- 1 Women Medical Officer, THQ Hospital, Jalalpur Pirwala, Multan Pakistan
Data collection, Manuscript writing
- 2 Assistant Professor, Department of ENT, SIMS/ Services Hospital, Lahore Pakistan
Literature review
- 3 Senior Registrar, Department of ENT, Amna Inayat Medical College, Sheikhupura Pakistan
Statistical analysis
- 4 Professor & Head, Department of ENT, Amna Inayat Medical College, Sheikhupura, Pakistan
Supervised the study
- 5 ENT Consultant, Dr. Faisal Masood Teaching Hospital, Sargodha Pakistan
Results analysis
- 6 Associate Professor, Department of ENT, University College of Medicine & Dentistry (UCMD), Lahore Pakistan
References layout

CORRESPONDING AUTHOR

Dr. Noman Ali

Senior Registrar, Department of ENT, Amna Inayat Medical College, Sheikhupura Pakistan
Email: nomanali8782@gmail.com

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ABSTRACT

Background: Nasal bone fractures are commonest type of facial bone fractures and 3rd most common among all body fractures. **Objective:** To compare the post operative aesthetic outcome after close reduction of fractured nasal bone when performed under local anesthesia and general anesthesia. **Study Design:** Randomized control trial. **Settings:** Department of ENT, Mayo Hospital Lahore Pakistan. **Duration:** From September 2018 to December 2020. **Methods:** Seventy patients with diagnosis of nasal bone fracture were included. Patients were randomized into two groups by random number table. Close reduction of Group A was done under local anesthesia and group B under general anesthesia. Pre and post operative aesthetic outcomes were measured by Likert score and nasal angles. **Results:** Mean age of patients was 23.8 ± 8.59 years. 90% patients were males and 10% were females. Statistically significant difference in aesthetic outcome was present between general and local group at 1st and 3rd month of follow up. **Conclusion:** In patients of fractured nasal bone post operative aesthetic outcome after close reduction are better under general anesthesia at 1st and 3rd month of follow up. However, at 6th month of follow up results are not statistically significant for reduction under both types of anesthesia.

Keywords: Nasal bone, Aesthetic outcome, Local anesthesia, Close reduction, General anesthesia.

INTRODUCTION

Prominent and exposed position of nose on face results in susceptibility to nasal trauma and subsequent fracture. Nasal bone fractures are the most common type of facial bone fractures and indeed are one of the most common reason for patient's referral to ENT departments.¹ Estimated incidence of nasal bone fracture in facial injuries is 39% and it is the third most common among all body fractures.^{2,3}

Nasal bone fracture commonly results from road traffic accidents, assaults and sport injuries.⁴ Incidence is higher in males than in females.⁵ Patient mainly presents with history of trauma to nose, swelling of nasal bridge, crepitus, epistaxis, and periorbital ecchymosis. Reduction of nasal bone fracture under local or general anesthesia is important because of external deformity and impending complications. Factors such as force, impact direction,

nature of striking object and patient's age will influence the pattern of injury to both the cartilaginous and bony components of nose. Nasal bone fractures may be isolated or associated with other bone injuries like Le Fort fractures.⁶

Nasal bone fractures are classified depending on degree of damage and management. Controversy regarding close reduction of fractured nasal bone to be performed under local and general anesthesia yet exists and there are different studies conducted across the globe which describe the advantages and disadvantages of both.

Aim of this study is to compare the post operative aesthetic outcomes of patients using Likert scale after closed reduction under local and general anesthesia. In our society there is poor follow up of patients and very few and inconclusive literature is available on this topic. As aesthetics are important concern for everyone, such

studies can enhance our knowledge which can later be applied to achieve the best outcome and patient's satisfaction.

METHODS

This randomized control trial study conducted at the Department of ENT, Mayo Hospital Lahore. Sample size of 70 patients (35 in each group) was calculated by using 5% level of significance, 90% power of test with expected percentages of local as 84% and general as 52%.⁷ Adult patients of more than 12 years of age with isolated nasal bone fracture having obvious external deformity presented within 14 days of injury were included in this study. Patients with fractured nasal bone with septal hematoma/abscess, CSF rhinorrhea, hemodynamically unstable, previous history of nasal trauma with craniofacial deformity, having preference to specific anesthesia and unfit for any type of anesthesia were excluded.

All patients undergoing close reduction were enrolled after informed consent and demographic data including age, gender were noted. Diagnosis of nasal bone fracture was made by clinical history, physical examination and radiograph of nasal bone. Two groups were made. Patients were randomized using computerized "random number table". Group A was operated under local anesthetic lidocaine 2% with vasoconstrictor adrenaline; injected into the space between medial canthus and glabella on each side and below the infraorbital rim bilaterally. Group B was operated under general anesthesia regimen in the operating room of the hospital. Manual reduction was done by external digital manipulation in both groups. External fixation was done by Plaster of Paris cast applied for 7 days. Post operatively they followed up after 1 month, 3 months, and 6 months. Pre and post operative assessment of patient's aesthetic was done by five-point Likert scale and measurements of nasal angles i.e., nasofrontal, nasofacial and nasolabial angle by ENT specialist at follow up visits. Patients were asked to number the aesthetic outcome from 1-5 score (1: Much worse, 2: Somewhat worse, 3: Stayed the same, 4: Somewhat better, 5: Much better) according to their level of satisfaction. Scoring of more than 3 were considered as better outcome. Difference between pre and post operative nasal angles was noted and compared with the normal nasal angles. Data was analyzed by using SPSS version 23, using mean and standard deviation. Comparison of likert scores, nasofrontal, nasofacial and nasolabial angles was done by paired t test. Significant difference was considered when p value was ≤ 0.05 .

RESULTS

Mean age of patients in this study was 23.8 ± 8.59 years. Seventy patients were included and among them 63(90%) were male and 7(10%) were female. Statistically significant differences were present between pre operative likert score and post operative likert scores at 1st, 3rd and 6th months of follow up for both local and general anesthesia group ($p = .000$). Mean likert scores of general group were greater than mean likert scores of local group and differences were statistically significant at 1st and 3rd months of follow up ($p = .000$). Table-1

Table 1: Comparison of post operative likert score at 1st, 3rd and 6th months of follow up between local and general group (Independent samples test)

| Follow up duration | Group | N | Mean | SD | Significance |
|---------------------------------------|---------|----|------|------|--------------|
| Likert score at 1 st month | Local | 35 | 3.91 | .284 | .000 |
| | General | 35 | 4.00 | .000 | |
| Likert score at 3 rd month | Local | 35 | 4.11 | .323 | .000 |
| | General | 35 | 4.46 | .505 | |
| Likert score at 6 th month | Local | 35 | 4.23 | .426 | .283 |
| | General | 35 | 4.71 | .458 | |

Statistically significant differences were present between pre operative nasofrontal angle and post operative nasofrontal angle at 1st, 3rd and 6th months of follow up for both local and general anesthesia group ($p = .000$). Mean nasofrontal angles of general group were greater than mean nasofrontal angles of local group at 3rd and 6th months but no statistically significant differences were present at 1st, 3rd and 6th months of follow up ($p > 0.05$). Table 2

Table 2: Comparison of post operative nasofrontal angle at 1st, 3rd and 6th months of follow up between local and general group (Independent samples test)

| Follow up duration | Group | N | Mean | SD | Significance |
|--|---------|----|--------|-------|--------------|
| Nasofrontal angle at 1 st month | Local | 35 | 129.31 | 1.078 | .127 |
| | General | 35 | 128.80 | 1.302 | |
| Nasofrontal angle at 3 rd month | Local | 35 | 129.77 | .646 | .199 |
| | General | 35 | 129.89 | 1.183 | |
| Nasofrontal angle at 6 th month | Local | 35 | 129.89 | .676 | .518 |
| | General | 35 | 130.11 | .963 | |

Statistically significant differences were present between pre operative nasofacial angle and post operative nasofacial angle at 1st, 3rd and 6th months of follow up for both local and general anesthesia group ($p = .000$). Mean nasofacial angles of local group were greater than

mean nasofacial angles of general group but no statistically significant differences were present at 1st, 3rd and 6th months of follow up ($p>0.05$).

Statistically significant differences were present between pre operative nasolabial angle and post operative nasolabial angle at 1st, 3rd and 6th months of follow up for both local and general anesthesia group ($p=.000$). Mean nasolabial angles of local group were greater than mean nasolabial angles of general group at 1st and 3rd months but no statistically significant differences were present at 1st, 3rd and 6th months of follow up ($p>0.05$).

DISCUSSION

Central and anterior position of nose on the face results in nasal bone fracture which accounts approximately 39-45% of all facial bones fractures and 3rd most common human skeletal fractures.⁸ Different surgical techniques are being considered for management depending on the surgeon's preference, patient's choice and hospital protocol. Out of which Close reduction is the most commonly performed procedure for simple nasal bone fractures.⁹ Our study showed that statistically significant differences were present between pre operative likert score and post operative likert scores at 1st, 3rd and 6th months of follow up for both local and general group ($p=.000$). Post operative mean likert scores of general group (4.00, 4.46, 4.71) were greater than mean likert scores of local group (3.91, 4.11, 4.23) and differences were statistically significant at 1st and 3rd months of follow up ($p=.000$). A study conducted by Al-Moraissi *et al* stated that general anesthesia resulted in better appearance of nose ($p=.006$) and less corrective surgeries in form of septoplasty, septorhinoplasty and rhinoplasty ($p=.04$).¹⁰ Vielela F found that patients were much satisfied with reduction under LA with 0% dissatisfaction even after 6 months of follow up.⁷ Atighechi *et al* and Hwang K reported that no statistically significant difference was present between GA and LA ($p>.005$ and $p=.038$ respectively) in terms of failure rate of procedure and persistence of nasal deformities after one month of follow up.^{11,12}

Nasofrontal angle is important in determining the facial aesthetics and attractiveness.^{13,14} Nasofrontal angle of 130 degrees is considered acceptable with an ideal range of 127-142 degrees.¹⁵ Post operative mean nasofrontal angles of general group (128.80, 129.89, 130.11) were greater than mean nasofrontal angles of local group (129.31, 129.77, 129.89) at 3rd and 6th months but no statistically significant differences were present at 1st, 3rd and 6th months of follow up ($p=.127, .199, .518$). Till date no study is available which compared the nasofrontal angle after close reduction between general and local anesthesia, however Leong S and Pasinato R *et al* reported the statistically significant differences between pre and post

op nasofrontal angle under LA as $p=.0027$ and $p<.001$ respectively in their studies.^{16,17}

Nasofacial angle quantitatively affects the facial and nasal aesthetics.¹⁸ Statistically significant differences were present between pre operative nasofacial angle and post operative nasofacial angle at 1st, 3rd and 6th months of follow up for both local and general group ($p=.000$). Here also Leong S and Pasinato R *et al* stated the statistically significant differences between pre and post op nasofacial angle under LA as $p=.004$ and $p=.01$ respectively.^{16,17}

Post operative mean nasofacial angles of local group (31.86, 32.31, 32.31) were greater than mean nasofacial angles of general group (31.29, 32.14, 32.26) but no statistically significant differences were present at 1st, 3rd and 6th months of follow up ($p=0.052, .786, .616$).

Statistically significant differences were present between pre operative nasolabial angle and post operative nasolabial angle at 1st, 3rd and 6th months of follow up for both local and general group ($p=.000$). Leong S stated that no statistically significant difference was seen between pre and post manipulation nasolabial angle under LA as $p=0.59$.¹⁶ However, Pasinato R *et al* found the statistically significant difference between pre and post operative nasolabial angle under LA ($p<.001$).¹⁷ Ingels stated that significant difference was seen between pre and post operative nasolabial angle after strut placement under general anesthesia ($p=.02$).¹⁹

Post operative mean nasolabial angles of local group (91.83, 92.34, 92.40) were greater than mean nasolabial angles of general group (91.37, 92.31, 92.66) at 1st and 3rd months but no statistically significant differences were present at 1st, 3rd and 6th months of follow up ($p=.164, .056, .131$).

CONCLUSION

Results of this study demonstrate that post operative aesthetic outcome after close reduction of fractured nasal bone are better under general anesthesia at 1st and 3rd months of follow up when compared under local anesthesia. However, at 6th month of follow up results are not statistically significant for reduction under both types of anesthesia.

LIMITATIONS

There were no significant limitations in the study

SUGGESTIONS / RECOMMENDATIONS

We suggest to use more variables and longer duration of study for measurement of nasal aesthetic.

CONFLICT OF INTEREST / DISCLOSURE

Nil.

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REFERENCES

1. Khan TQ, Ahmad KK, Shaukat A, Yamin Y, Ahmad S, Siddiqui J. Medicolegal aspects of nasal bone fractures. *Ann King Edward Med Uni.* 2003;9(4):270-1.
2. Rhee SC, Kim YK, Cha JH, Kang SR, Park HS. Septal fracture in simple nasal bone fracture. *Plast Reconstr Surg.* 2004;113(1):45-52.
3. Reilly MJ, Davison SP. Open vs closed approach to the nasal pyramid for fracture reduction. *Arch Facial Plast Surg.* 2007;9(2):82-6.
4. Hussain K, Wijetunge DB, Grubnic S, Jackson IT. A comprehensive analysis of craniofacial trauma. *J Trauma Acute Care Surg.* 1994;36(1):34-47.
5. BAJWA RA, MEHMOOD F, JALIL S. Frequency and Etiology of Different Types of Nasal Bones Fracture Reporting at a Tertiary Care Centre, Lahore. *Pak J Med Health Sci.* 2012;6(1):703-9.
6. Scherer M, Sullivan WG, SMITH Jr DJ, Phillips LG, Robson MC. An analysis of 1,423 facial fractures in 788 patients at an urban trauma center. *J Trauma Acute Care Surg.* 1989;29(3):388-90.
7. Vilela F, Granjeiro R, Mauricio C, Andrade P. Applicability and Effectiveness of Closed Reduction of Nasal Fractures under Local Anesthesia. *Int Arch Otorhinolaryngol.* 2014;18(3):266-71.
8. Kang BH, Kang HS, Han JJ, Jung S, Park HJ, Oh HK, Kook MS. A retrospective clinical investigation for the effectiveness of closed reduction on nasal bone fracture. *Maxillofac Plast Reconstr Surg.* 2019;41(1):1-6.
9. Mondin V, Rinaldo A, Ferlito A. Management of nasal bone fractures. *Am J Otolaryngol.* 2005;26(3):181-5.
10. Al-Moraissi EA, Ellis E. Local versus general anesthesia for the management of nasal bone fractures: a systematic review and meta-analysis. *J Oral Maxillofac Surg.* 2015;73(4):606-15.
11. Atighechi S, Baradaranfar MH, Akbari SA. Reduction of nasal bone fractures: a comparative study of general, local, and topical anesthesia techniques. *J Craniofac Surg.* 2009;20(2):382-4.
12. Hwang K, Yeom SH, Hwang SH. Complications of nasal bone fractures. *J Craniofac Surg.* 2017;28(3):803-5.
13. Fontana AM, Muti E. Surgery of the naso-frontal angle. *Aesthetic Plast Surg.* 1996;20(4):319-22.
14. Pearson DC, Adamson PA. The ideal nasal profile: rhinoplasty patients vs the general public. *Arch Facial Plast Surg.* 2004;6(4):257-62.
15. Naini FB, Cobourne MT, Garagiola U, McDonald F, Wertheim D. Nasofrontal angle and nasal dorsal aesthetics: a quantitative investigation of idealized and normative values. *Facial Plast Surg.* 2016;32(4):444-51.
16. Leong SC, Abdelkader M, White PS. Changes in nasal aesthetics following nasal bone manipulation. *J Laryngol Otol.* 2008;122(1):38-41.
17. Pasinato R, Mocellin M, Arantes MC, Coelho MS, Dalligna DP, Soccol A. Pre and post operative facial angles in patients submitted to rhinoplasty. *Intl Arch Otorhinolaryngol.* 2008;12(3):393-6.
18. Naini FB, Cobourne MT, Garagiola U, McDonald F, Wertheim D. Nasofacial angle and nasal prominence: A quantitative investigation of idealized and normative values. *J Craniofac Surg.* 2016;44(4):446-52.
19. Ingels K, Orhan KS. Measurement of Preoperative and Postoperative Nasal Tip Projection and Rotation. *Arch Facial Plast Surg.* 2006;8(6):411-5.