

Satisfaction with cosmesis following nasal manipulation: do previous fractures matter?

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Abstract

Objective: To determine if patients who have had multiple previous nasal fractures and who undergo manipulation of fractured nasal bones under general anaesthetic (MUA) are as likely to be satisfied with their post-operative nasal cosmesis as patients who have only sustained a single injury.

Design: Telephone survey.

Setting: District general hospital.

Participants: Adult patients who had undergone MUA over the preceding three years.

Main outcome measures: Patient satisfaction with nasal cosmesis and nasal airway and willingness to consider corrective surgery.

Results: One hundred and two patients were contacted. Overall patient satisfaction with cosmesis and nasal airway was 82 and 77 per cent, respectively, with 15 per cent willing to consider a procedure to improve their nasal cosmesis and 12 per cent willing to consider a procedure to improve nasal airway. Twenty-three (22.5 per cent) gave a history of one or more nasal bone fractures, either treated or untreated, prior to the most recently treated injury. Patient satisfaction with cosmesis in this group was 65 per cent, compared with 87 per cent satisfaction in the single injury group ($p = 0.03$). No statistically significant differences were demonstrated when comparing these groups for: satisfaction with nasal airway (70 vs 80 per cent, $p = 0.46$); willingness to consider a procedure to improve cosmesis (26 vs 11 per cent, $p = 0.16$); and willingness to consider a procedure to improve nasal airway (17 vs 10 per cent, $p = 0.46$).

Conclusions: A history of multiple previous nasal fractures does appear to alter patient satisfaction with the cosmetic outcome of nasal manipulation. These patients should be informed that they have a decreased chance of attaining a cosmetically acceptable result.

Key words: Nasal Deformities, Acquired; Fractures; Nasal Bones; Patient Satisfaction; Outcomes

Introduction

Nasal bone fractures are a common injury¹ and make up a significant percentage of the workload in otolaryngology operating theatres. The standard technique is closed reduction, with the majority of surgeons in the United Kingdom performing this procedure under general anaesthesia (MUA).² Patient satisfaction with cosmesis following this procedure is variable, with studies showing satisfaction rates of 68–87 per cent.^{3–12} There is, however, limited information on what factors influence patient satisfaction following this procedure. This study was prompted by a previous audit (Clement and Dempster, unpublished data) which noted a trend towards patients with a history of previous nasal fracture being much less likely to be satisfied with their nasal cosmesis following fractured nasal bones MUA than were those presenting with their first nasal fracture.

Methods

A telephone interview was undertaken with all adult patients (aged 13 years and over) who had undergone MUA of fractured nasal bones in Raigmore Hospital, Inverness, Scotland, between 1 January 2002 and 30 April 2005. Patients were identified using the operating theatre log database. All patients with telephone numbers available were to be contacted. Demographic details were recorded, including age and sex plus time elapsed since manipulation. A minimum period of one month was to have elapsed between manipulation and telephone review. A telephone questionnaire (Appendix 1), based on a previous study questionnaire by Crowther and O'Donoghue,⁴ was used to identify patient satisfaction with nasal cosmesis and airway and to determine whether or not they would consider surgery to improve these symptoms if they were problematic.

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Accepted for publication: 1 November 2005.

Patients were also asked if they had sustained more than one nasal bone fracture in the past. A history of previous and impending nasal surgery was also obtained. No routine follow up of patients had been undertaken post-operatively, as per unit policy. All patients who were dissatisfied with either their nasal cosmesis, nasal airway or both, and who had not previously actively sought advice regarding this, were advised to consult their general practitioner for a referral to the otolaryngology department for assessment.

Statistics

Power analyses were performed prior to the study's commencement. These analyses were based on an audit performed earlier at another Scottish hospital (Clement and Dempster, unpublished data). These authors undertook a small study of 19 patients and noted a trend towards patients with two or more previous nasal fractures prior to nasal MUA being less satisfied with nasal cosmesis post-operatively, compared with patients with no history of previous nasal fracture (40 vs 86 per cent, respectively). In this study, 26 per cent of patients had had a previous nasal fracture. Power analyses on these data showed that in order for a trial to achieve a power of 0.8 and to be able to demonstrate this level of difference between its two arms with a significance level of 5 per cent, a minimum of 20 patients would be required in each trial arm. As the ratio of patients with one or more previous fractures to those with no previous fracture was around 1:4, a total study size of 100 patients was needed. Statistics were calculated using the Chi-squared test with Yates correction, unless otherwise stated.

Results

One hundred and seventy patients received MUA for fractured nasal bones during the study period. Telephone contact numbers were available for 124. One hundred and two patients (60 per cent of the total and 82 per cent of those with contact numbers) were contacted. The male to female ratio was 79:23, mean age was 30.5 years (range, 13–63 years) and mean follow-up time was 15.6 months (range, 1–42 months). Overall patient satisfaction rates with cosmesis and nasal airway were 82 per cent (84/102) and 77 per cent (79/102), respectively, with 15 per cent (15/102) willing to consider a procedure to improve their nasal cosmesis and 12 per cent (12/102) willing to consider a procedure to improve their nasal airway. Fifty-eight (57 per cent) felt that the shape of their nose post-operatively was similar to its pre-injury shape. Eight (8 per cent) had had a further nasal injury since their procedure. Eight had previously had nasal surgery (four MUAs, one septoplasty, one rhinoplasty and two other procedures). Twenty-three patients (22.5 per cent) gave a history of one or more nasal bone fractures (either treated or untreated) prior to the most recently treated injury. Comparison of subjective outcomes between this group and the group with

TABLE I
COMPARISON OF SUBJECTIVE OUTCOMES FOR SINGLE NASAL FRACTURE VS MULTIPLE NASAL FRACTURE PATIENTS

Patient response	Single fracture group <i>n</i> (%)	Multiple fracture group <i>n</i> (%)	<i>p</i>
Nasal cosmesis satisfaction	69/79 (87)	15/23 (65)	0.03*
Post-op nasal shape similar to shape before injury	49/79 (62)	9/23 (39)	0.09*
Would consider cosmetic nasal surgery	9/79 (11)	6/23 (26)	0.16*
Nasal airway satisfaction	63/79 (80)	16/23 (70)	0.46*
Would consider functional nasal airway surgery	8/79 (10)	4/23 (17)	0.46†
Would consider either cosmetic or functional nasal surgery	14/79 (18)	6/23 (26)	0.55*

p values calculated using *Chi-squared test with Yates correction and †Fisher's exact test. Post-op = post-operative

no previous nasal injury was performed; results are shown in Table I.

The only statistically significant relationship ($p = 0.03$) demonstrated was a relative risk reduction of 25 per cent (95 per cent confidence intervals (CI), 5–45 per cent) and an absolute risk reduction of 22 per cent (95 per cent CI, 4–41 per cent) when comparing post-operative satisfaction with cosmesis in the single injury group with that in the multiple injury group. The incidence of repeated nasal injury following treatment was 17 per cent (4/23) in the multiple injury group and 5 per cent (4/79) in the single injury group ($p = 0.07$, Fisher's exact test). The two groups were similar in mean age (34.0 vs 29.5 years, $p = 0.09$, Mann–Whitney test) and mean follow-up time (15.4 vs 15.7 months, $p = 0.82$, Mann–Whitney test). Women made up 22 per cent (5/23) of the multiple nasal injury group and 23 per cent (18/79) of the single injury group. Analysis comparing male and female satisfaction with outcomes and willingness to consider further surgery demonstrated no statistically significant differences. Twenty patients were willing to consider further surgery, eight for nasal airway alone, five for cosmesis alone and seven for both nasal airway and cosmesis. No patients had had further surgery at the time of contact.

Discussion

It would appear common sense that patients who have had multiple nasal injuries associated with nasal bone fractures would have worse nasal cosmesis following nasal fracture MUA than those who have had only a single injury; however, no previous study has directly addressed this question.

When examining outcomes for nasal fracture MUA, several issues must be considered. Firstly, it

is difficult to obtain objective measures for the outcomes of nasal fracture MUA, as there are no objective tools that correlate well with patient satisfaction with nasal cosmesis and airway.⁷ Subjective patient satisfaction with outcomes has long been used to quantify outcomes, but this is not without individual patient and cultural variables. Patient satisfaction with cosmesis is variable; other studies have demonstrated this to be between 64 and 87 per cent.^{3–12} Patient satisfaction with nasal airway following this procedure has been found to be 64–86 per cent.^{4,7,9,10} Our overall, subjective results compare similarly to these studies, with cosmetic and nasal airway satisfaction rates of 82 and 77 per cent, respectively. Revision surgery rates following nasal fracture MUA have been used to quantify success, but, again, these are variable (between 3.2 and 36 per cent).^{6,10,13–15} Surgeon satisfaction with nasal cosmesis was frequently used as an outcome measure in earlier studies, often utilizing complex scoring systems; however, these results varied considerably from patient satisfaction,¹⁶ and few surgeons continue to use them as outcome measures as they have been found to be of limited practical value.

There is little evidence-based data relating to other factors that may influence patient satisfaction following nasal fracture MUA. Surgical variables, such as seniority of surgeon,¹⁷ technical procedure,^{6,16,17} timing of procedure¹⁸ and type of anaesthesia,^{3,9,11,14} have all been questioned. Patient variables, such as age, sex,¹³ cultural attitudes, degree of bony deformity,¹⁷ type of bony fracture,¹⁶ presence and/or type of cartilaginous fracture,^{15–17,19} previous nasal surgery, and previous nasal bone fracture,¹³ have all been studied. There is also some evidence that patient satisfaction may decrease with extended length of follow up.⁷

We acknowledge that there are several weaknesses in this study. Firstly, it is retrospective and thereby relies on patient recall and reporting. Secondly, we did not assess for other variables that may have independently altered outcome. Thirdly, we were only able to follow up 60 per cent of our patients. We also acknowledge that the repeat fracture rate following manipulation was greater in the multiple fracture group (13 vs 5 per cent, $p = 0.07$), with this trend not quite reaching statistical significance. We were, however, attempting to examine this question from a pragmatic point of view, so that we would be able to give patients more information about the likely outcomes and satisfaction rates for treatment of their condition. Follow-up rates in comparable studies have been between 55 and 75 per cent,^{4–7,9,11,14} i.e. comparable with our series. It is unknown why such poor follow-up rates occur. We suspect this is due to these patients being a young, mobile population. The high proportion of patients (27 per cent) in our study who did not have a contact telephone number is suggestive of this.

This study supports the hypothesis that having a history of multiple previous nasal fractures prior to undergoing closed MUA of fractured nasal bones does influence patients' satisfaction with nasal

cosmesis. This is supported by other data in our study. Firstly, only 39 per cent of the multiple fracture group, compared with 62 per cent of the single injury group, felt that the shape of their nose was similar post-operatively compared with before the injury ($p = 0.09$). Secondly, a greater proportion of the multiple fracture group was willing to consider surgery to improve their nasal cosmesis (26 vs 11 per cent, $p = 0.16$). Although these results did not reach statistical significance, the trends are highly suggestive that there is a difference between the two groups.

We were unsure why patients with a history of multiple nasal fractures were less likely to be satisfied with their post-operative nasal cosmesis. Noses with multiple previous fractures may be more unstable and therefore may fracture into a position which is less easy to manipulate. Noses with multiple previous fractures may also be less stable post-operatively due to underlying cartilaginous injuries, the forces of which pull the nasal bones into a cosmetically unacceptable position. The effect of other patient variables such as personality traits is also possible.

This study, although unlikely to alter operative practice, gives us additional information that will allow surgeons to better inform their patients, pre-operatively, of the likelihood of a satisfactory post-operative cosmetic outcome.

- **There is limited research assessing factors that influence outcomes in nasal fracture manipulation**
- **This study found that patients undergoing nasal fracture manipulation who report multiple previous nasal fractures were less likely to have a satisfactory cosmetic outcome than those presenting with only the one fracture (65 vs 87 per cent, respectively)**
- **Patients with multiple previous nasal fractures should be informed, when consented pre-operatively, that they are less likely to achieve a satisfactory cosmetic result**

References

- 1 Muraoka M, Nakai Y. Twenty years of statistics and observation of facial bone fracture. *Acta Otolaryngol Suppl* 1998; **538**:61–5
- 2 Kapoor PK, Richards S, Dhanasekar G, Kumar BN. Management of nasal injuries: a postal questionnaire survey of UK ENT consultants. *J Laryngol Otol* 2002; **116**:346–8
- 3 Waldron J, Mitchell DB, Ford G. Reduction of fractured nasal bones; local versus general anaesthesia. *Clin Otolaryngol Allied Sci* 1989; **14**:357–9
- 4 Crowther JA, O'Donoghue GM. The broken nose: does familiarity breed neglect? *Ann R Coll Surg Engl* 1987; **69**: 259–60
- 5 Dickson MG, Sharpe DT. A prospective study of nasal fractures. *J Laryngol Otol* 1986; **100**:543–51
- 6 Fernandes SV. Nasal fractures: the taming of the shrewd. *Laryngoscope* 2004; **114**:587–92
- 7 Illum P. Long-term results after treatment of nasal fractures. *J Laryngol Otol* 1986; **100**:273–7

- 8 Owen GO, Parker AJ, Watson DJ. Fractured nose reduction under local anaesthesia. Is it acceptable to the patient? *Rhinology* 1992;**30**:89–96
- 9 Rajapakse Y, Courtney M, Bialostocki A, Duncan G, Morrissey G. Nasal fractures: a study comparing local and general anaesthesia techniques. *ANZ J Surg* 2003;**73**: 396–9
- 10 Robinson JM. The fractured nose: late results of closed manipulation. *N Z Med J* 1984;296–7
- 11 Watson DJ, Parker AJ, Slack RW, Griffiths MV. Local versus general anaesthetic in the management of the fractured nose. *Clin Otolaryngol Allied Sci* 1988;**13**:491–4
- 12 Wild DC, El Alami MA, Conboy PJ. Reduction of nasal fractures under local anaesthesia: an acceptable practice? *Surgeon* 2003;**1**:45–7
- 13 Green KM. Reduction of nasal fractures under local anaesthetic. *Rhinology* 2001;**39**:43–6
- 14 Courtney MJ, Rajapakse Y, Duncan G, Morrissey G. Nasal fracture manipulation: a comparative study of general and local anaesthesia techniques. *Clin Otolaryngol Allied Sci* 2003;**28**:472–5
- 15 Rohrich RJ, Adams WP Jr. Nasal fracture management: minimizing secondary nasal deformities. *Plast Reconstr Surg* 2000;**106**:266–73
- 16 Staffel JG. Optimizing treatment of nasal fractures. *Laryngoscope* 2002;**112**:1709–19
- 17 Murray JA, Maran AG, MacKenzie IJ, Raab G. Open v closed reduction of the fractured nose. *Arch Otolaryngol* 1984;**110**:797–802
- 18 Murray JAM, Maran AGD. The treatment of nasal injuries by manipulation. *J Laryngol Otol* 1980;**94**:1405–10
- 19 Fry H. The importance of the septal cartilage in nasal trauma. *Br J Plast Surg* 1967;**20**:392–402

Appendix 1. Fractured nasal bones questionnaire

Hospital number:

Age:

Sex:

Number of months post-op:

1. Following your operation, is the appearance of your nose similar to what it was before the injury? Yes / No

2. Are you satisfied / happy with the shape of your nose? Yes / No
3. If you are unhappy with the shape of your nose, would you consider an operation to improve the appearance? Yes / No
4. Was your nose broken more than once before your operation? Yes / No
5. If yes, how many times?
6. Has your nose been broken since your operation? Yes / No
7. Have you had more difficulty breathing through your nose since the injury? Yes / No
8. If yes, is it bad enough to consider an operation that would improve your breathing? Yes / No
9. Have you had more than one operation on your nose? Yes / No
10. If you have, can you remember what was done and when?
11. Were any of these other nose operations performed at Raigmore Hospital? Yes / No
12. Any comments about your operation or care?

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Mr M Supriya takes responsibility for the integrity of the content of the paper.
Competing interests: None declared
