
ORIGINAL ARTICLE

NASAL FRACTURES: A STUDY COMPARING LOCAL AND GENERAL ANAESTHESIA TECHNIQUES

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Background: The objective of the present study was to examine the outcome of nasal fracture reduction under both local anaesthesia and general anaesthesia techniques.

Methods: Patient records were obtained from clinic lists of patients attending the otolaryngology (ORL) outpatient unit at Wellington Hospital or the plastic surgical unit at Hutt Hospital over a 24-month period. To meet criteria for inclusion, patients had to have an isolated nasal deformity, be aged 14 years or older and be at least 6 months post reduction. Functional and aesthetic results were assessed using subjective and objective end outcome measures. A questionnaire was developed and used to assess subjective outcomes. The number of patients proceeding to open operative correction was used for the objective measure, which included septoplasty, septorhinoplasty or rhinoplasty.

Results: A total of 197 patients had nasal fractures manipulated over this period. One hundred and seven were manipulated under general anaesthesia (GA) and 90 were manipulated under local anaesthesia (LA). The questionnaire completion rate was 66%. Patient demographics were statistically similar between the two groups. There was no statistical difference in patients' subjective assessment of outcome with treatment by GA or LA. More patients preferred to have their fracture manipulated under GA but this was not statistically significant. There was no significant difference between GA and LA groups in progression to open operative correction.

Conclusions: Both LA and GA appear to be acceptable and satisfactory methods of anaesthesia in the reduction of simple displaced nasal fracture.

Key words: anaesthesia, complications, fracture, nose, reduction.

Abbreviations: GA, general anaesthetic; LA, local anaesthetic; ORL, otolaryngology; POP, plaster of paris.

INTRODUCTION

Nasal fractures account for 39% to 45% of all facial fractures and are a common problem that present to both otolaryngology and plastic surgery units.^{1–3} The majority tend to be laterally displaced or depressed fractures.²

Despite their frequency, questions still remain unanswered regarding their optimal and most effective management and the factors that influence outcome. Some centres advocate reducing fractures under general anaesthesia (GA) whereas others state that local anaesthesia (LA) is just as satisfactory. Debate also exists about the use of plaster of paris (POP) splinting and nasal packing.

In the Wellington region, the Wellington Otolaryngology and Head and Neck Unit (ORL) and the Hutt Plastic Surgical Unit both treat nasal fractures.

The aim of the present study was to review the outcomes of two methods of anaesthesia used in treatment of simple nasal fracture and to assess outcome subjectively from a patient's point of view and objectively by the likely progression to subsequent surgery.

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METHODS

A retrospective review was performed of all patients presenting for treatment of simple nasal fracture from 1 January 1999 to 31 December 2000.

In the Wellington ORL unit the majority of the simple nasal fractures were reduced under LA. Local anaesthetic was performed at the time of the initial assessment in the ORL clinic. This anaesthesia consisted of cophenylcaine forte topical spray intranasally (5% lignocaine HCl, 0.5% phenylephrine HCl and 0.1 mg/mL benzalkonium chloride; Paedopharm, Perth, Western Australia, Australia) followed by application with topical cocaine paste (10% cocaine with 0.06% adrenalin) and injection intranasally of 2% xylocaine and 1:80 000 adrenalin. A small proportion of patients at the Wellington ORL unit were reduced under GA. Usually these patients were children. In the Hutt Plastic Surgical Unit all reductions were carried out under GA.

Reduction techniques were similar in both centres. At the Wellington ORL department most laterally displaced fractures were reduced by external digital manipulation with the occasional use of Walsham and Asch forceps to manipulate bony fragments and elevators to manipulate depressed fragments. In the Hutt Plastics Unit, digital manipulation was again employed; though depressed fragments were reduced by a gloved finger inserted intranasally. All patients treated at the Plastic Surgical unit were splinted using a POP splint with some patients receiving nasal packing. At the Wellington ORL unit no patients treated under LA had any splintage or packing. Both units conducted the nasal manipulation on the day of the initial assessment.

To be included in the study, patients had to have an isolated simple closed displaced nasal fracture with at least 6 months follow up. All children under the age of 14 were excluded from this study.

After reviewing the patients case records to assess treatment and outcome, a phone survey was performed. Patients were asked to make a subjective assessment of their nose post reduction compared to their nose before the fracture. They were asked to compare both the appearance and function of their nose. They were also asked about anaesthesia preference if they were to refracture their nose.

RESULTS

One hundred and fourteen patients presented to the Hutt Plastics Unit, all having a manipulation under GA. Seven of these patients were excluded from the study as they were children under 14. A total of 253 patients presented to the Wellington ORL unit, of which only 107 had the fracture treated. Of this group 90 had a LA and 17 had a GA. The 17 in the Wellington ORL group that had a GA were all excluded from the study, as they were children under 14 (see Fig. 1).

A total of 65 patients (67%) in the GA group and 59 (66%) in the LA group responded to the phone survey. Men outnumbered women 4:1 in both groups. The average time from injury to corrective surgery was 6 days in the GA group and 10 days in the LA group (see Table 1). Figure 2 shows that the breakdown of the types of injuries that caused the fractures was similar in both groups. Sport and assault accounted for the majority.

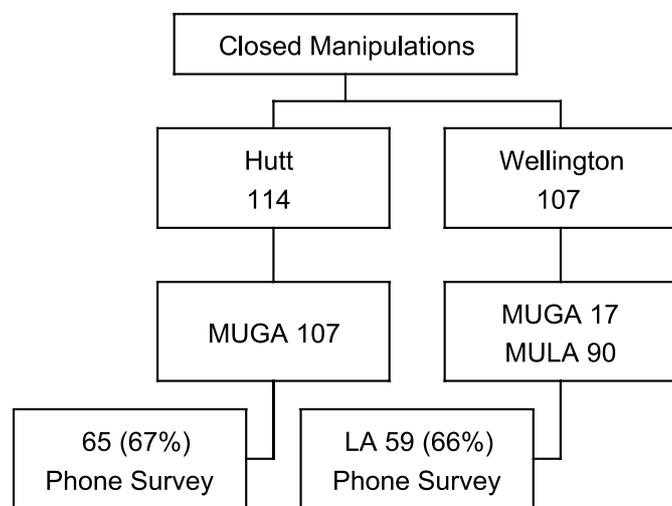


Fig. 1. Patient breakdown.

Table 1. Demographics: local vs general anaesthetic

	General anaesthetic	Local anaesthetic
Total number	65	59
Male : female	4:1	4:1
Average age (years)	23	23
Average time to reduction (days)	6 (1–17)	10 days (3–18)
Recurrent fractures (%)	14	12

The results of the phone survey are shown in Tables 2–6. These results showed that there was no statistical difference in the patients' assessment of outcome in appearance and function of the nose in both the LA group and the GA group.

When questioned about alternative anaesthesia if they were to refracture their nose, more people stated a preference for GA than LA (82% vs 69%) though this difference was not statistically different.

With regard to outcome post reduction and the subsequent progression to further surgery, such as a septoplasty, septorhinoplasty and rhinoplasty, there was no significant statistical difference. It appeared that more people in the LA group proceeded to further surgery than in the GA group (see Table 6) though because of the lack of numbers nothing can be statistically inferred.

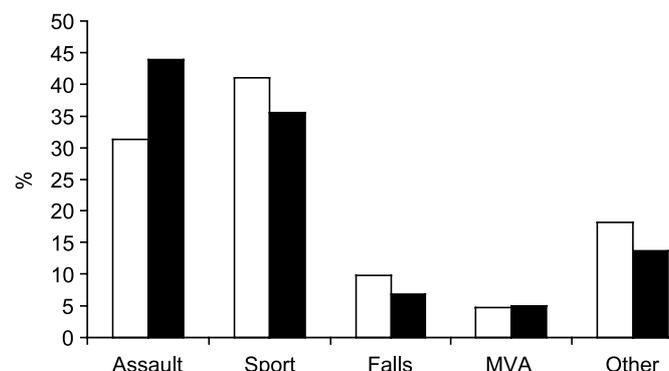


Fig. 2. Types of injury.

Table 2. Patient's satisfaction with appearance of nose

	General anaesthetic (n = 65)	Local anaesthetic (n = 59)	P
Better than before	9% (n = 6)	3% (n = 2)	0.19
Same as before	37% (n = 24)	37% (n = 22)	0.97
Worse but acceptable	43% (n = 28)	37% (n = 22)	0.52
Worse – wants further treatment	11% (n = 7)	22% (n = 13)	0.09

P = 0.18 (Kruskal–Wallis).

Table 3. Patient's satisfaction with function of nose

	General anaesthetic (n = 65)	Local anaesthetic (n = 59)	P
Better than before	3% (n = 2)	2% (n = 1)	0.62
Same as before	65% (n = 42)	56% (n = 33)	0.32
Worse but acceptable	18% (n = 12)	27% (n = 16)	0.23
Worse – wants further treatment	14% (n = 9)	15% (n = 9)	0.82

P = 0.28 (Kruskal–Wallis).

Table 4. Patient's overall satisfaction with nose

	General anaesthetic (n = 65)	Local anaesthetic (n = 59)	P
Never any problems	51% (n = 33)	53% (n = 31)	0.85
Occasional problems	37% (n = 24)	32% (n = 19)	0.58
Frequent problems	12% (n = 18)	15% (n = 9)	0.64

P = 0.99 (Kruskal–Wallis).

Table 5. Patient's satisfaction with anaesthesia

	General anaesthetic (n = 65)	Local anaesthetic (n = 59)
Prefer same treatment	82% (n = 53)	69% (n = 41)
Prefer alternative treatment	18% (n = 12)	31% (n = 18)

P = 0.11 (Kruskal–Wallis).

Table 6. Subsequent treatment post reduction

	General anaesthetic (n = 65)	Local anaesthetic (n = 59)
Septoplasty	0	1
Waiting list	1	0
Septo-rhino	0	3
Waiting list	0	1
Rhinoplasty	1	1
Waiting list	0	0
Planning to see GP (await follow up)	4	2
Suggested treatment when older or finished sports	2	0

DISCUSSION

Despite being a common entity, literature regarding the best management of simple nasal fractures is sparse and inconclusive.

Current literature suggests that the general consensus regarding the preferred treatment for simple displaced nasal fracture is closed manipulation.^{3–9} Studies by Illum report a satisfactory result with closed treatment in 90%.³ Crowther and O'Donoghue show similar results with 79% satisfaction with function and 85% satisfaction with the appearance of the nose.⁵ However, there is still debate and some studies having disputed this. Murray and Maran in 1980 reported a 30–40% failure rate.^{10–13}

Our results show, on average, 86% satisfaction with function and 84% satisfaction with appearance of the nose after closed manipulation with either GA or LA. Most people were also happy with the type of anaesthesia given. We can infer that from a patient's point of view both types of anaesthesia for closed reduction are acceptable.

A large proportion of people who had a LA were happy to have another one (69%). This was in accordance with other studies on the acceptability of LA in closed manipulation of nasal fracture.^{14–16} The majority of patients who had a GA (82%) preferred to have another one, though 18% stated they would consider an alternative anaesthetic, citing inconvenience and time off work as

the main reasons. Waldron showed that 92% of subjects studied found LA acceptable.¹⁵ Some studies have likened the pain experienced from having a nose anaesthetized to that resulting from a nerve block when visiting the dentist.¹⁴ There are many different ways to anaesthetize the nose and the technique used can have a significant impact on the patient's experience of the procedure. These studies showed that the most painful part of the procedure was the intranasal injection. In a review by el Kholi,¹⁷ all 12 patients involved tolerated a combination of EMLA cream and cocainization of the nasal mucosa without having an intranasal injection. The only draw back was the need to wait an hour for adequate anaesthesia to be established.

In our comparison of types of treatment it was noted that all the patients having a GA had a POP splint fashioned immediately after reduction. This was removed after 1 week. In contrast, all of the patients who had a LA were discharged unsplinted. Despite this there was no difference in the groups in the patient's subjective view of the nose compared to before injury. Published reports are also divided on whether to splint the reduced nasal fracture.^{1–3} Illum reported a greater satisfaction in function and appearance after 3 months in patients who had POP splintage compared with those who did not. Other studies only advocate splintage when the fracture is deemed unstable.²

The authors wish to acknowledge considerable bias in this retrospective review. Because the population of the study was predominantly young and male, it was hard to get a follow up higher than 66%. We opted for the phone survey rather than an objective assessment in clinic because of this. We acknowledge that performing a subjective phone survey can lead to inaccurate assessment of function and cosmesis. However, the eventual presentation to surgery is instigated by the patient who represents to clinic or seeks further treatment. We felt that the patients' subjective assessments would give a better indication of function and appearance than would objective assessments obtained by individually recalling patients. Even advanced measurement techniques would not take into account pre-fracture deformity of the septum.

An important point to note is the difference in what the patient thinks is acceptable and what the medical assessor thinks is satisfactory. This has been demonstrated by Dickson – objective assessment of treated fractured nose patients indicated that 50% of patients had a good result; however, subjective assessment by the patient showed an 83% satisfaction rate.⁸

There was also bias due to the difference in the level of expertise of the assessor of these fractures and technical skills of the reduction. Generally the treatments at both centres were performed by advanced subspeciality registrars. There was a slight variation in technique in the two centres such as out-fracturing with a gloved finger inserted intranasally at the plastic surgical unit and the occasional use of instruments in the ORL unit.

Unfortunately we were unable to find any conclusive difference between patients progressing to further surgery in the GA and LA groups. The progression to further surgery was initiated by the patient seeking a specialist appointment with either the ORL or Plastic Surgery Departments. The decision for any subsequent surgery was then made by the medical team. It appeared that more people who underwent LA required further surgery but the numbers were too small to be significant (five compared to one). It is our hope that a larger prospective study might more effectively investigate this in the future.

Our study showed that from a patient's subjective view there was no statistical difference in outcome in the treatment of nasal

fracture reduced under LA or GA. We conclude that both methods of anaesthesia are acceptable from a patient's assessment of outcome. Factors such as cost, hospital resource allocation, duration in hospital and time off work should be considered when deciding whether to treat a simple nasal fracture under LA or GA.

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REFERENCES

1. Renner G. Management of nasal fractures. *Otolaryngol. Clin. N. Am.* 1991; **24**: 195–213.
2. Doerr T. Nasal fractures. In: Cummings CW (ed.). *Otolaryngology Head and Neck Surgery*. Baltimore: Mosby, 1998; Ch. 46.
3. Illum P, Kristensen S, Jorgensen K, Brahe Pedersen C. Role of fixation in the treatment of nasal fractures. *Clin. Otolaryngol.* 1983; **8**: 191–5.
4. Robinson J. The fractured nose: late results of closed manipulation. *NZ Med. J.* 1984; **97**: 296–7.
5. Crowther J, O'Donoghue G. The broken nose: does familiarity breed neglect? *Ann. R. Coll. Surg. Engl.* 1987; **62**: 259.
6. Illum P. Long-term results after treatment of nasal fractures. *J. Laryngol. Otol.* 1986; **100**: 273–7.
7. Cook JA, McRae RD, Irving RM, Dowie LN. A randomized comparison of manipulation of the fractured nose under local and general anaesthesia. *Clin. Otolaryngol.* 1990; **15**: 343–6.
8. Dickson MG, Sharpe DT. A prospective study of nasal fractures. *J. Laryngol. Otol.* 1986; **100**: 543–51.
9. Harrison DH. Nasal injuries: their pathogenesis and treatment. *Br. J. Plast. Surg.* 1979; **32**: 57.
10. Murray J, Maran A. Fractures of the nose [Letter]. *Lancet* 1988; **1**: 649.
11. Murray JAM, Maran AGD. The treatment of nasal injuries by manipulation. *J. Laryngol. Otol.* 1980; **94**: 1405–10.
12. Murray JAM, Maran AGD. Open v closed reduction of the fractured nose. *Arch. Otolaryngol.* 1984; **110**: 797–802.
13. Mayell MF. Nasal fractures: their occurrence, management and some late results. *J. R. Coll. Surg. Edinb.* 1973; **18**: 31.
14. Owen GO, Parker AJ, Watson DJ. Fractured-nose reduction under local anaesthesia – is it acceptable to the patient? *Rhinology* 1992; **30**: 89–96.
15. Waldron J, Mitchell DB, Ford G. Reduction of fractured nasal bones; local versus general anaesthesia. *Clin. Otolaryngol.* 1989; **14**: 357–9.
16. Watson DJ, Parker AJ, Slack RW, Griffiths MV. Local versus general anaesthetic in the management of fractured nose. *Clin. Otolaryngol.* 1988; **13**: 491–4.
17. el Kholly A. Manipulation of the fractured nose using topical local anaesthesia. *J. Laryngol. Otol.* 1989; **103**: 580–1.