

Clinical Paper

# Does performing manipulation of nasal bones under local anaesthetic beyond two weeks after injury affect outcomes? A prospective study during the SARS-CoV-2 pandemic.

J Smith<sup>1</sup>, K O'Doherty<sup>2</sup>, B Hanna<sup>3</sup>

## Abstract

### Introduction

ENTUK guidelines recommend that manipulation of nasal bones (MNB) should be performed within 14 days of injury. However, evidence suggests treatment under general anaesthetic remains effective up to 5 weeks after injury. With the SARS-CoV-2 pandemic leading to delays in referral and limited access to theatre, local practice changed to offer delayed MNB under local anaesthetic. This prospective study assesses the effectiveness of MNB delayed until 3 weeks or later from time of injury when performed mostly under local anaesthetic.

### Methods

Data was prospectively collected between April and November 2020. All patients referred to ENT with a new nasal bone deformity presenting more than 21 days after injury were included. Demographic information, injury details and patient satisfaction was recorded for each patient.

### Results

11 patients were included. Average age was 32.6 years (Range 8-65 years). 10 procedures (91%) were performed under local anaesthetic, with 1 (9%) performed under general anaesthetic. 9 patients (82%) gained complete reduction of the deformity, and 1 patient (9%) gaining partial reduction. 10 patients (91%) patients were satisfied with the cosmetic outcome.

### Conclusion

This study supports the small volume of recent literature showing that delayed manipulation of nasal bones is effective and additionally demonstrates that efficacy is maintained when performed under local anaesthetic

### Keywords:

Nasal bone; nasal bone fracture; manipulation of nasal bones; local anaesthetic

### Introduction

Manipulation of nasal bones (MNB) is a useful and effective

procedure that can improve the cosmetic appearance of the nasal bones following trauma. It is commonly performed under general anaesthetic less than 2 weeks after initial injury, a pathway traced to a study by Staffel<sup>1</sup> examining the optimization of nasal fractures. Indeed, current ENTUK guidelines align with his expert recommendation, stating the procedure should be performed within 14 days of injury.<sup>2</sup>

The necessity for the use of general anaesthetic has been challenged by recent studies and there is now a significant evidence base demonstrating that MNB with local anaesthetic is a more cost effective and convenient procedure with higher patient satisfaction and comparative success rates of fracture reduction.<sup>3</sup>

Two recent studies<sup>4,5</sup> have also suggested an extended time-frame for offering intervention post injury but MNB was performed under general anaesthetic in these studies.

The emergence of the SARS-CoV-2 virus changed traditional referral pathways and ultimately led to delays in presentation of patients with nasal trauma to the ENT department. Equally, theatre access was limited thus restricting application of the procedure under general anaesthetic. This unique situation led to a change in local practice with patients receiving MNB outside the traditional 2 week window, and with local anaesthetic rather than general.

A literature search did not reveal any study discussing the outcomes for patients undergoing delayed MNB under local anaesthetic. Thus, our prospective study aims to assess outcomes of a cohort of patients undergoing MNB with local anaesthetic and affirm whether this is a viable treatment option in future cases.

### Methods

Data was prospectively collected between April and

<sup>1</sup> Specialist Registrar, ENT, Royal Victoria Hospital, Belfast HSC Trust

<sup>2</sup> Trust Grade Doctor, ENT, Ulster Hospital, Dundonald, South Eastern HSC Trust

<sup>3</sup> Consultant Otorhinolaryngologist, ENT, Royal Victoria Hospital, Belfast HSC Trust

**Corresponding author:** Jonathan.Smith

**Email:**Jonathan.Smith@belfasttrust.hscni.net



November 2020. All patients referred to ENT with a confirmed nasal bone deformity presenting more than 21 days after injury were included. All patients were offered MNB under local anaesthetic with the option of general anaesthetic restricted to those cases that could be justified to the theatre planning committee. Demographic information, mechanism of injury, time from injury to manipulation, and outcomes relating to both patient satisfaction and completeness of fracture reduction were recorded for each patient.

### **Ethical considerations**

This study is a prospective observational study of a change in clinical practice that occurred during the SARS-COVID pandemic. It presented a unique opportunity to the record the effect of delayed MNB under local anaesthetic, an event which would not normally occur on a sufficiently frequent basis to permit sufficient data collection. All data was anonymized.

### **Results**

11 patients were included, 6 females (55%) and 5 males (45%). Average age was 32.6 years (Range: 8-65 years). 6 injuries (55%) were caused by mechanical fall, 3 during sport (27%), 1 during a seizure (9%), and 1 during an alleged assault (9%). (see table 1)

10 patients (91%) had MNB under local anaesthetic, with 1 patient (a child) accepted for general anaesthetic. The average time of manipulation from point of injury was 29 days (Range: 17-45 days). All assessments and manipulations were performed by suitably trained junior ENT surgeons under appropriate senior supervision.

There was movement of the nasal bones in 10 patients (91%) and complete reduction of the nasal bone deformity in 9 patients (82%), with 1 patient (9%) gaining partial reduction. 1 patient (9%) did not gain any benefit with no palpable movement nor reduction. 10 patients (91%) were satisfied with the outcome of the procedure. (see table 2)

The single patient who did not demonstrate any nasal bone movement and was not satisfied was treated 28 days from the time of injury, which correlates with the median of the time from injury to MNB.

### **Discussion**

Nasal bone fractures are the most common facial fracture, accounting for 59.8% of all facial fractures in children and adolescents<sup>6</sup> and 17.7% in adults<sup>7</sup>. They can be accompanied by a cosmetic deformity that may be psychologically debilitating. MNB is a well-established procedure that can be performed in such cases with studies recognizing an 85.6% satisfaction rate due to improvement in cosmesis.<sup>4</sup>

Current ENTUK guidelines echo the expert opinion of Staffel<sup>1</sup>, noting that MNB should be performed less than 14 days after injury. A prospective study by Basheeth<sup>4</sup> et al challenges this, demonstrating satisfactory outcomes

in 3 patients treated 4 weeks or more after nasal injury. A similar study by Perkins et al<sup>5</sup> found 8 out of 10 patients offered MNB greater than 21 days post injury to have mobile nasal bones, noting this patient group to have comparable satisfaction scores when compared to a cohort treated less than 14 days after injury. These studies, however, present data associated with general anaesthetic procedures and are therefore not entirely analogous to our own.

A systematic review by Chadha et al<sup>8</sup> assessing the use of local anaesthesia in MNB notes this to be a safe and efficacious method, with the procedure being well tolerated and little reported evidence of major adverse outcomes. They also note no statistical difference in patient satisfaction in those treated by general or local anaesthetic.

Noting 10 out of 11 of patients (91%) to have had MNB performed under local anaesthetic, our cohort demonstrates outcomes comparable to the documented literature with mobile nasal bones in 10 patients (91%) and complete reduction of the nasal bones in 9 patients (82%). This study therefore demonstrates that a delayed MNB under local anaesthetic is a clinically justifiable procedure when undertaken by an appropriately trained practitioner. There is no literature evidence comparing the outcomes of MNB when performed by different grades of clinician, however it is logical to surmise that appropriate levels of training in assessment and manipulation are required to obtain similar results to that reported in our cohort.

The upper limit of an extended time-frame is not predicted by age, sex or mechanism of injury, however with 2 patients (18%) undergoing the procedure over 42 days from the initial injury, we suggest that the traditional 14 days is an overly conservative timeframe.

With the inclusion of a single child, it is impossible to draw any firm conclusions of the applicability of our findings to a paediatric population. However, the successful reduction in this patient suggests that an extended timeframe in children may be worthy of further research. Children's bone is less calcified with a greater propensity for greenstick fractures.<sup>9</sup> This would be of particular clinical benefit to the child, as any invasive surgical procedures on the midface are usually avoided until fully grown and thus, appropriate intervention with an MNB may prevent the young patient carrying a persistent nasal bone deformity through their formative years and avoid any potential bullying or psychological issues that may accompany this.

### **Conclusion**

As evidence of an increased time frame continues to be documented, our cohort, whilst small, demonstrates that the current recommendation of performing MNB less than 14 days from injury is overly conservative. Our data suggests that local anaesthetic MNB in the outpatient setting as far as 45 days after injury can be offered, with no expected compromise in outcome.



Patient	Age	Sex
1	35	Female
2	26	Female
3	36	Female
4	65	Male
5	15	Male
6	24	Male
7	58	Female
8	60	Female
9	8	Female
10	15	Male
11	17	Male

Table 1: Demographic information

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Patient	Injury type	Days from injury to manipulation	Anaesthetic used?	Movement of nasal bones?	Reduction of nasal bones?	Patient Satisfied
1	Seizure	45	Local	Yes	Complete	Yes
2	fall	25	Local	Yes	Partial	Yes
3	Sport	28	Local	No	No reduction	No
4	Fall	28	Local	Yes	Complete	Yes
5	Assault	24	Local	Yes	Complete	Yes
6	Fall	23	Local	Yes	Complete	Yes
7	Fall	39	Local	Yes	Complete	Yes
8	Fall	22	Local	Yes	Complete	Yes
9	Fall	26	General	Yes	Complete	Yes
10	Sport	42	Local	Yes	Complete	Yes
11	Sport	17	Local	Yes	Complete	Yes

Table 2: Mechanism of injury, procedural details and outcomes

