Is a fractured mandible an emergency?

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Abstract

We retrospectively audited the records of 708 patients who presented with the diagnosis of fractured mandible between January 2009 and July 2013 at the Queen Elizabeth Hospital, Birmingham. We assessed the different factors that may have altered their outcomes, and found that delay before definitive fixation caused no harm in either the short or the long term.
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Keywords: Fracture mandible theatre delay

Introduction

When a patient presents with a fractured mandible there are various opinions about the length of time that should elapse between the injury and definitive fixation before outcome is compromised. Some of the published evidence advocates a maximum delay from time of injury of 12 hours,[1,2] and some within 24 hours.[3] Two studies have suggested that patients who have definitive fixation more than 72 hours after injury have worse outcomes than those who are treated sooner. There is also contradictory evidence that there is no difference in outcome in patients who have definitive surgery within the first 72 hours of injury and those who are operated on later.[4] However Wagner et al[5] suggested that there is a spike in complications on both days two and six after injury, which leads to the conclusion that days three and four are the optimal days for fixation.

Given that 65% of maxillofacial surgery units in the United Kingdom have no dedicated trauma list,[6] this increases the burden on the provision of emergency theatre lists. This in turn increases the likelihood of such operations being done after 1700 hours, and therefore reduces the likelihood of a consultant operating.[7] It has also been shown that 60% of maxillofacial patients on the emergency theatre list wait more than 12 hours, and 29% wait longer than 24 hours.[7]

Currently there is obviously a burden on the emergency theatre list, and no sound evidence to indicate the best time for definitive fixation of mandibular fractures or how long this optimal window lasts. It is also imperative to find out whether a patient with a fractured mandible requires emergency treatment or whether the operation can be delayed until an elective list. This may also relieve pressure on beds and reduce complaints about delays in getting to theatre.

We aimed to review retrospectively whether there was an optimal time for fixation of a fractured mandible. We looked at morbidity to find out whether one period of time was associated with a reduced number of complications compared with another.

Method

We organised a retrospective study using information from the records of 708 patients who presented with the diagnosis

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Table 1
Correlation between time before operation and morbidity. Data are number (% of total).

	0–24 hours	24–72 hours	72 hours–1 week	>1 week	Chi square	p value
Total no of cases	252 (35.6%)	388 (54.8%)	56	12	–	–
Postoperative infection requiring antibiotics	11	21	3	1	0.63	0.89
Removal of fixation required (plate and screws)	17	16	2	2	5.61	0.13
Return to theatre	12	15	4	0	1.90	0.66
Fibrous non-union/non-union	2	4	1	0	5.59	0.14
Malocclusion recorded	26	27	8	1	4.48	0.21
Overall complication rate	68	83	18	4	5.15	0.17

There were no significant differences among the complications.

Table 2
Grade of primary surgeon operating. Data are number of patients.

	0–24 hours	24–72 hours	72 hours–1 week	>1 week	Chi square value	p value
Consultant	41	63	10	5	5.43	0.14
Registrar	186	292	44	7	6.54	0.51
SHO	25	33	2	0	3.53	0.50

There were no significant differences among the grades of surgeon.

Table 3
Unilateral or bilateral fracture. Data are number of patients.

	0–24 hours	24–72 hours	72 hours–1 week	>1 week	Chi Squared value	p value
Unilateral	56	105	15	4	2.84	0.42
Bilateral	196	273	41	8	2.84	0.42

There were no significant differences between the sides.

of fractured mandible between January 2009 and July 2013 to the Queen Elizabeth Hospital, Birmingham. All casenotes and radiographs were reviewed and the following data were recorded: age, sex, whether the patient was admitted to the intensive care unit (ICU), and the number of days between injury and definitive repair. Patients were classified into four groups according to the time from the alleged incident until operative intervention (treated: within 24 hours, between 24 and 72 hours, 72 hours to a week, and longer than a week).

The outcomes that we looked at in the notes were: if the patient had to return to theatre, and why; if the patient had a postoperative infection that required treatment with antibiotics; if the patient required removal of metalwork (plate) within the first year postoperatively; if the patient had a fibrous union/non-union (diagnosed clinically and radiographically); and if the patient had a malocclusion post-operatively.

The following factors that may influence outcome were also assessed: the grade of the surgeon operating; whether the fracture was unilateral or bilateral; and the type of fixation used.

We excluded: isolated condylar fractures; pathological fractures; patients who had had a previous fracture of the mandible; patients who were conservatively managed; patients under 18 years of age; revision operations of an existing current fracture of the mandible; and operations that required an external fixator.

Notes were assessed for up to a year after the date of injury, as this was deemed the maximum period for follow up. The significance of the differences among the various groups was analysed using the chi square test with the aid of IBM Statistics for Windows (version 20, IBM Corp, Armonk, NY, USA).

Results

Of the 708 patients 662 (93.5%) were male and 46 (6.5%) female, and their mean (range) age was 28 (18–78) years.

Table 1 shows the correlation between complications and time of operation, and that there were no significant differences in complication rates. Table 2 shows that there was no significant difference among the groups between the grade of the primary surgeon who did the operation. However, a consultant operated in nearly half of the cases not operated on for a week, compared with less than a quarter in the three other groups (0–24 hours, 24–72 hours, and 72 hours-one week). Table 3 shows that there was no significant difference in the proportion of unilateral or bilateral fractures within each of the groups.

Table 4 shows that there were significant differences in the method of fixation between the various time groups. The proportion of cases that required both plating and intermaxillary fixation increased with the length of time from injury to theatre, and the use of a reconstruction plate increased in proportion from 10.8% in the 24–72 hours group to 25% in the over one week group.