

Time To Open Repair Of Mandible Fractures And Associated Complications

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PURPOSE

The aim of this study is to determine whether a correlation exists between the time from injury to repair of mandible fractures and the development of post operative complications

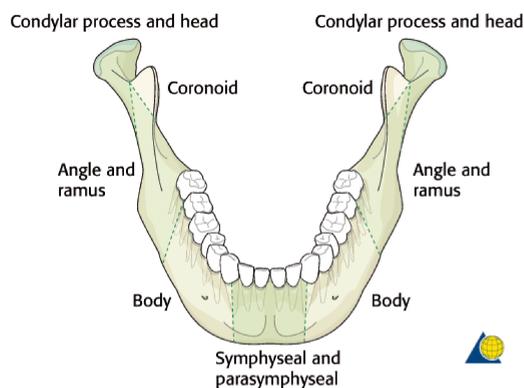
HYPOTHESIS

Timing for repair of mandible fractures is a clinically significant factor to the rate of post operative complications.

Delay in repair is associated with increased technical challenges which is reflected by increased surgical time

INTRODUCTION

Mandible fractures are one of the most common facial fractures in the United States are typically treated by oral and maxillofacial surgeons, plastic reconstructive surgeons and ear, nose and throat surgeons. Many aspects of the management of mandible fractures, from the fixation techniques to the use of perioperative antibiotics have been studied and yielded supporting data. However the question of when to repair remains a source of debate. The lack of evidence-based studies have contributed to the current disagreement among surgeons, leading to increased patient risks and exposure to postoperative complications. Complications include the development of post-operative infection, hardware failure/exposure, malocclusion, malunion, nonunion or iatrogenic injury to cranial nerves V and VII.



METHODS

A 3 year retrospective analysis was performed (from July 1, 2015 to June 30, 2018) at the Augusta University Medical Center (AUMC) and Children's Hospital of Georgia (CHOG)

161 patients with mandible fractures

excluding patients treated outside of AUMC and CHOG (Charles Norwood Veterans Affairs Medical Center and Augusta State Medical Prison)

98 patients reviewed

excluding patients with inadequate follow up and those treated with closed reduction or external fixation of their mandible fractures

64 patients included in study

Data collected:

- patient's age
- patient's gender
- mechanism of injury
- type of fractures present*
- timing of repair
- method of intervention
- surgery time
- follow up days
- Social history (tobacco, alcohol and controlled/illicit substances)

*All injuries classified were subjected to Facial Injury Severity Scoring (Bagheri et al. FISS in *Craniomaxillofacial Trauma. J Oral Maxillofac Surg* 2006).

Anatomic region	Fracture type	Score
Mandible	Dento-alveolar	1
	Body/ramus/symphysis	2
	Condyle/coronoid	1
Mid-face	Dento-alveolar	1
	Lefort I	2
	Lefort II	4
	Lefort III	6
	NOE complex	3
Upper-face	ZMC	1
	Nasal	1
	Orbital roof/rim	1
Combined length of all facial lacerations > 10 cm	Frontal sinus - displaced	5
	Frontal sinus - undisplaced	1

FISS: Facial injury severity scale, NOE: Nasal orbital ethmoid, ZMC: Zygomatico-maxillary complex

- Our outcome measurements were the presence of complications
- Complications were subcategorized as mechanical (ie malocclusion, malunion or delayed union) or infection (also includes hardware failure or seroma formation).
- The presence of cranial injury (CN V3 and CN VII) injury was not included as a complication.

RESULTS

- There were a total of 111 mandible fractures on the 64 patients, and 35 patients had multiple fractures (54.6%)
- The average Facial Injury Severity Score (FISS) was 3.59 (range of 1 to 7).
- The average time from injury to definitive repair was 15.27 days (median =11 days, mode = 9 days)
- There were 12 complications out of the 64 patients treated (9 postoperative infections and 3 mechanical failures), for an overall complication rate of 18.75%. Of the 12 patients with a complication, 8 of them were treated earlier than 15 days post injury (66.67%), and 6 of them (50%) had a positive history of substance abuse.

Clinical and Demographic Characteristics

Mean age, years	36.19
Gender, % male	71.90
Substance abuse, %*	60.90
Mean days to fixation	15.27
Median days to fixation	11.00
*tobacco, alcohol, and or illicit drug use	

Mandible Fractures in study (n=64 patients)

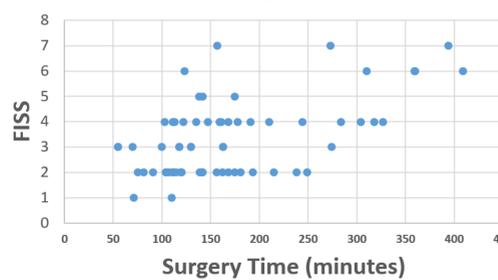
	#
Total	111
Patients with multiple fractures	35
Subcondylar	33
Body	33
angle	26
Symphysis	18
Coronoid	1

Mechanism of injury

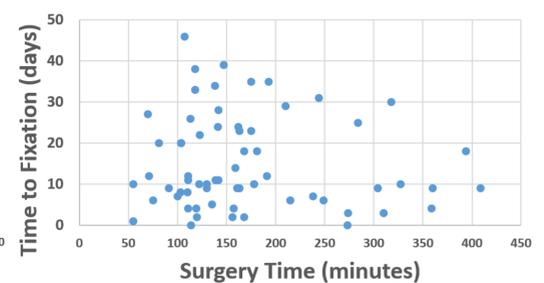
Mechanism of injury	#
Assault	29
Motor vehicle collision*	17
Ground level fall	10
Accident**	6
*includes motorcycle and ATV accidents	
**includes basketball injury, fall from ladder, pool injury	

	Patients	Mean days to fixation
No complications	52	15.33
All Complications	12	15.00
Infection	9	18.00
Mechanical	3	7.00

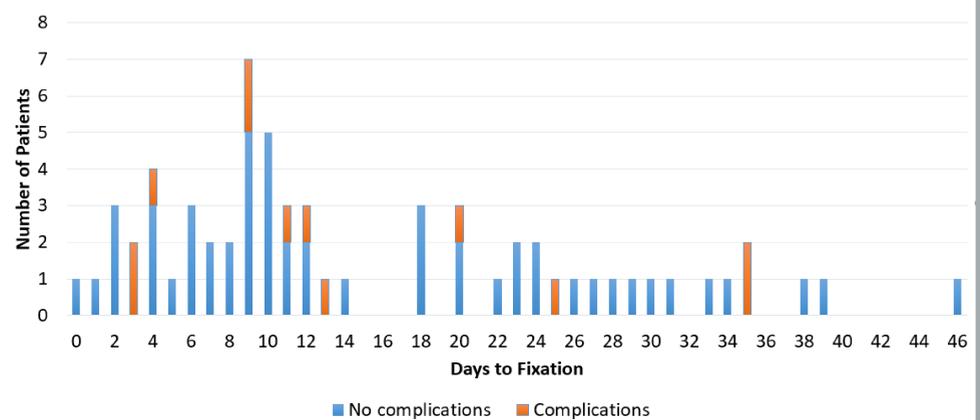
FISS vs Surgery Time



Time to Fixation vs Surgery Time



Histogram showing number of complications/non-complicated patients repaired at each post trauma day



CONCLUSIONS

1. Our study did not reveal a statistically significant difference in the development of a post-operative complication based on timing of definitive repair. This supports the findings of previous studies in which there is no strong evidence for immediate surgical intervention of mandibular fractures to minimize complications.
2. There is a loose relationship between time from injury to fixation and surgical time to perform fixation
3. Limitations of this study, aside from being retrospective, include possible errors in documentation, data entry, lack of follow up and low n value. A larger patient population is needed

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