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Research Article

**RESULTS OF INTERNAL FIXATION AND OPEN  
REDUCTION FOR MANDIBULAR FRACTURES**<sup>1</sup>Dr Zahira Nawaz, <sup>2</sup>Dr Sumayya Tanvir, <sup>3</sup>Muhammad Asad Khan<sup>1</sup>Army Medical College, Rawalpindi<sup>2</sup>Dental section Faisalabad Medical University, Faisalabad.<sup>3</sup>Dental section Faisalabad Medical University, Faisalabad.**Article Received:** March 2020**Accepted:** April 2020**Published:** May 2020**Abstract:**

**Aim:** This study was held to determine the postoperative results in 90 mandibular fracture patients treated by internal fixation and open reduction at Oral and Maxillofacial department.

**Study Design:** A prospective study.

**Place and Duration:** In the Oral and Maxillofacial Surgery Department of Mayo Hospital Lahore for one year duration from January 2019 to January 2020.

**Methods:** Data regarding the postoperative outcome and fracture pattern was reviewed and evaluated. The most communal origin of fracture was road traffic accident and Parasymphysis was the common site.

**Results and Conclusion:** 80 patients (83%) had efficacious uneventful postoperative results. Infection was the usual impediment noted among eleven patients was infection (12.2%) followed by malocclusion in nine patients (10%) and damage to the fifth nerve (n = 7; 7.8%)

**Key words:** mandible fracture, rigid internal fixation, postoperative complications.

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**INTRODUCTION:**

Fractures of the mandible are the utmost communal facial skeleton fractures due to its important position in the maxillofacial region<sup>1-2</sup>. These facial bone fractures occur mostly in combination with other bones or sometimes alone. The location of the fracture be contingent on the mechanism of the injury, the size and direction of the impact force, site anatomy and mandible prominence<sup>3</sup>.

Treatment of mandibular fractures varies depending on the maxillofacial unit's equipment's around the world. It also depends on the surgical experience of the operator, clinical presentation of the case and equipment accessible in maxillofacial surgery departments. Conventionally, specialists have tried to attain 4 main aims in the mandibular fracture's treatment: anatomical reduction, immobilization, infection prevention, and functional rehabilitation. Achieving these aims is vital for effective healing of bone fractures and the proper working of the postoperative stomatognathic system<sup>4-5</sup>.

To ensure aesthetic and quick retrieval, maxillofacial specialists have innovative surgical skills that offer improved treatment selections for mandibular insufficiency<sup>6</sup>. Current trends in the mandibular fractures treatment include Arch bars and Gunning's splints, closed reduction with intermaxillary fixation (IMF) by dental wiring, intraosseous wiring and open reduction and open reduction and IMF and compression plates, rigid internal fixation by miniplates, lag screws and non-compression plates<sup>7-8</sup>. The primary bone healing rises by rigid internal fixation without the protracted period of intermaxillary fixation for restriction. The IMF elimination frequently leads to fast functioning of the mandible, better nutrition and easier oral hygiene. Prompt mobilization of patients averts the possibility of ankylosis, especially in youngsters, and decreases the possibility of complications postoperatively in immobilized and poly-traumatized patients. Also, it inhibits deadly events of mentally handicapped, war wounds, epileptic and multiple injuries<sup>9</sup>. Though, in spite of these compensations, rigid internal fixation has been disparaged for greater indisposition, procedural difficulties, longer operating time, equipment cost, second tile removal

process and long stay in hospital. In addition, this method of treatment caused postoperative complications other than traditional methods. A postoperative defect occurs when the plates are incorrectly placed during attachment. Extra-oral and intraoral approaches can cause nerve damage and external scars. The roots of the teeth can be damaged or these plaques can be a permanent root of infection<sup>10</sup>.

The goal of this study is to assess the advantages and postoperative complications related with rigid internal fixation (ORIF and open reduction. This study will help us take precautions to reduce postoperative complications.

**MATERIAL AND METHODS:**

This prospective study was held in the Oral and Maxillofacial Surgery Department of Mayo Hospital Lahore for one-year duration from January 2019 to January 2020. A total of 90 patients identified with fractures of mandibular, managed with rigid internal fixation or open reduction and related with no other fractures of the face were selected for the study. The pathological fractures, Condylar fractures and subjects with severe systemic ailment were omitted from the analysis. With the consent of the selectees, all essential data about the study variables was recorded in written consent form and prepared on the basis of meticulous clinical examination and history taking. The sensory disturbance, occlusion and preoperative infection were evaluated and assessed in a clinical trial. Patients were followed for infection, normal union, mal-union, non-union, fifth and seventh nerve disturbances and mal-occlusion. The data obtained was analyzed and evaluated using descriptive statistics.

**RESULTS:**

21-30 years was the most common affected age group with a mean value of  $24.9 \pm 15.4$  years. In terms of gender distribution, the M: F ratio was 5.6: 1 and mostly were males.

The supreme causes of injuries were road accidents ( $n = 39$ ; 43.3%), shadowed by fall ( $n = 27$ ; 30%). The usual fracture site was parasymphysis ( $n = 28$ ; 31.1%) trailed by fracture of mandibular angle ( $n = 24$ ; 26.7%) (Table 1).

**TABLE 1: DISTRIBUTION OF MANDIBULAR FRACTURES ACCORDING TO SITE**

Site	No. of fractures	%age
Parasymphysis	28	31.1%
Symphysis	15	16.7%
Angle	24	26.7%
Ramus	4	4.4%
Body	19	21.1%
Total	90	100.0%

A total of 65 patients succeeded, characterized by anatomical reduction, clinical association, restoration of normal function and pre-traumatic occlusion (72.2%). Infection was the common complication noted among eleven patients was infection (12.2%) followed by malocclusion in nine patients (10%) and damage to the fifth nerve (n = 7; 7.8%), (Table 2).

**TABLE 2: POSTOPERATIVE OUTCOME**

Study variable	No	%age
Non-union	1	1.1%
Normal union	86	95.6%
Delayed union	1	1.1%
Infection	11	12.2%
Malocclusion	9	10.0%
Malunion	5	5.6%
5 <sup>th</sup> nerve injury	7	7.8%
7 <sup>th</sup> nerve injury	1	1.1%

### DISCUSSION:

The objective of any fracture treatment is to correct the shape and function with minimal morbidity. The main cause of fractures during this study was RTA and parasymphysis was the communal site. These results are in line with previous studies. Bony union is probable in 4-6 weeks with immobilization and proper reduction. Ninety-five percent of subjects had clinically fruitful results of normal bone union. This study results overlap with the Lindqvist and Iizuka study, which reported 93.9% of the normal union of mandibular fractures. This study also includes Dodson TB et al and Peled M. et al whose results were 82.6% and 83%, respectively. In previous studies, an infection rate of 3% to 27% was reported for ORIF. Fracture pattern, technical errors, prophylactic antibiotic deficiency, fracture site motility and patient mismatch are considered to be predisposing factors for infection<sup>11</sup>. Current research suggests that infection is the most common complication (12.2%). Eight patients responded to antibiotics and four responded to early plate removal. A similar infection rate has been observed in previous studies. Few studies have acknowledged an advanced infection rate for rigid internal fixation. Moreno JC et al. Study reported 12.5% and Renton TF et al. 915%, Jaques B et al research showed 2.9% of infection, which is less than reported in current literature and research. The second most common complication was postoperative malocclusion (10%). The presence of postoperative occlusion defects depends on the patient's condition, number of fractures, type of fracture,

degree of fragment displacement, type of reduction, fixation and immobilization. Previous Smith reports WP20 (7.5%), Cawood JI19 (8%), Peled M et al. 4 (8.0%) and Dodson TB et al. 7 (7.7%) corresponds to this study<sup>12</sup>. Some studies have shown that a different percentage of malocclusion ranges from 2.5% to 18.2% for rigid internal fixation. The observed postoperative malocclusion was insignificant and was managed with selective occlusal grinding<sup>13</sup>. Malunion is the bone segments healing in a non-physiological position because of improper fixation of displaced fractures. It can occur due to dental plate bending or a slight reduction in the number of broken intraoperative segments. The mal-union come across in this study was low and did not require surgical intervention. Occlusive discrepancies are eliminated by using occlusive balancing procedures<sup>14</sup>.

Sensory disorders were recorded in accordance with the patient's complaint. Sensory disorders were recorded as low alveolar nerves, mental nerves and lingual nerve disorders. Sensory disorders of two mental nerves and one lower alveolar nerve have been reported. This is due to the fact that the flap is raised and the screws are accidentally placed on the nerves<sup>15</sup>. In this study, like Iizuka and Lindqvist and Dodson TB et al. there is no involvement in the mandibular branch of the facial nerve. Sensory disorders were reported in 3% of the mental nerve in Schon R et al study and Jaques B et al reported 1.45% after rigid fixation. During open reduction, inferior alveolar, mental nerve and marginal mandibular branches of

facial nerve are at great jeopardy of injury. In this study, all subjects with sensory disorders were conservatively managed.

### CONCLUSION:

Osteosynthesis by internal fixation and open reduction delivers ideal stability for healing and allow instant function of stomatognathic system. It was found that rigid internal fixation by screws and plates provides exact reduction, better aesthetic results, increased patient comfort and safety, early restoration of functional life and a low percentage of complications in the hands of experienced surgeons. In addition, more controlled prospective studies are needed for rigid internal fixation and open reduction of mandibular fractures to establish clinical protocols.

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