ORIGINAL ARTICLE

A Study on the Surgical Management of Mandibular Fractures by Different Treatment Modalities

Muhammad Anwar, Tariq Iqbal, Saleem A. Malik

Abstract: **Background**: Treatment of mandibular fractures is basic to the treatment of maxillofacial trauma. As the principles of internal fixation and compression osteosynthesis were adopted by maxillofacial surgeons during recent years the time-honoured methods of intermaxillary fixation and transosseous wiring has gradually become less favoured method of treatment in most of the cases.

Objectives: The objectives of this study was to evaluate the results achieved in the surgical treatment of mandibular fractures by different techniques with respect to restoration of the pre-existing anatomical form, functional occlusion of the dentition, facial esthetics and to propose a simple, efficient, and cost-effective technique for mandibular fractures.

Materials and Methods: This cross-sectional study was conducted in the plastic surgery department of Pakistan Institute of Medical Sciences (PIMS) Islamabad during 1½-year period from 1st July 1999 to 31st December 2000. 105 cases of mandibular fractures were included in this study and a total of 174 fractures were treated by different surgical techniques. The mean age was 27.3 years and male to female ratio of 6:1. The patients were assigned into three groups according to the type of surgical technique used: 35 patients had closed reduction plus intermaxillary fixation (CR+IMF); 20 patients had non-rigid osteosynthesis; 50 patients had rigid/semi-rigid osteosynthesis. Outcome was measured by preoperative variables (age, gender, mechanism of fracture, site and number of fractures, nerve function, associated injuries and delay in treatment) and postoperative variables (duration of intermaxillary fixation (IMF), duration of admission, malunion, nonunion, infection, and nerve function), which were assessed during the follow up period.

Results: The results showed that the preoperative variables and demographic features were similar in all groups. All the three treatment modalities were successful in restoring functional occlusion. Ten patients required reoperation or readmission and a total of 25 complications were noted. These complications were observed in fractures treated by CR+IMF (6), non-rigid osteosynthesis (6), rigid osteosynthesis (13), and included 05 soft tissue infection (4.8%), 09 malocclusion (8.5%), 04 malunion (3.8%), 05 mental nerve dysfunction (4.7%), and 02 cases of facial nerve (mandibular branch) damage (1.9%). There was no incidence of non-union or osteomyelitis. Bone healing was satisfactory in 100% of cases. The rigid osteosynthesis avoided the use of IMF better than the non-rigid group. There was a higher incidence of malunion in CR+IMF (5.7%) compared with non-rigid (5%), and rigid (3.8%) groups, but 8.5% patients of the open reduction and internal fixation (ORIF) group developed mental nerve paresthesia and 4% facial nerve weakness.

Conclusion: Based on the results of this study we concluded that a brief period of intermaxillary fixation (IMF) helps to stabilize the occlusion, allows reattachment of the soft tissue drape and promotes initial primary bone healing, and overall CR+IMF with 2.7-mm cortical bone screws is the simplest, less invasive, efficient, and cost-effective technique.

Key words: Mandible, Fracture, Occlusion, IMF, Osteosynthesis, Open Reduction and Internal Fixation (ORIF).

Dr. Muhammad Anwar
FCPS (plast), MD (USA)
Assistant Professor of plastic surgery , Burn & Plastic Surgery Department
Sheikh Zayed Medical College/Hospital, Rahim Yar Khan
E-mail: manwarmd@gmail.com
Ph. 03006320916

Dr. Tariq Iqbal ,*FCPS*
Professor and Head Burn Care center
PIMS, Islamabad
Prof. Saleem A. Malik, *FRCS(C),*
Diplomat American Board of Plastic Surgery
Consultant Plastic Surgeon
Shifa International Hospital, Islamabad
Ex Prof & Head Plastic Surgery Dept PIMS, Islamabad

Introduction

Treatment of mandibular fractures is basic to the treatment of maxillofacial trauma. The prominent position and configuration of the mandible are such that it is one of the most frequent facial bones to be fractured.[1] Because of the mandible's contribution to speech, mastication, deglutition, and to the form of the lower portion of the face, fractures of this structure must receive careful consideration.[2] Successful treatment of mandibular fractures results in an anatomic bony union with restoration of normal occlusion and function. Maxillofacial trauma, especially the mandibular fractures, remains the major part of workload at plastic surgery unit of Pakistan Institute of Medical Sciences, Islamabad. The rapid mechanization of our society in recent years along with miserable conditions of the roads and noncompliance with the traffic rules has resulted in an increased incidence of maxillofacial trauma.[3,4] The most common causes of mandibular fractures are road traffic accidents, falls, missile injuries, assault and sporting accidents.[5,6] A clear understanding of the etiology and extent of all the maxillofacial injuries will be useful in planning to prevent or to reduce the number and severity of such injuries. These data will also be useful in assessing the current requirements of maxillofacial service in our hospital and for better future planning to handle the increasing number of patients with maxillofacial trauma. The fractures of the mandible require early diagnosis, rapid and proper treatment and possible rehabilitation for optimum results. Unfortunately these fractures still remain maltreated due to nonavailability of specialty service even in the tertiary care hospitals. This ultimately leads to delay in the definitive treatment. Reduction and immobilization is the accepted universal principle to treat a bony fracture and this goal can be achieved with a variety of treatment modalities.[7]

In simplest terms, treatment may be categorized as closed reduction plus intermaxillary fixation (CR + IMF), open reduction with internal fixation (ORIF), or external pin fixation (EPF). Open reduction with internal fixation may be accomplished with transosseous wires or with bone plates & screws, performed intraorally, extraorally, or percutaneously. Open reduction with internal fixation with bone plates may be further subdivided into rigid internal fixation (RIF) with dynamic compression plates (DCP) or semirigid internal fixation with miniplates.[7] Previously the most popular method for mandibular fracture treatment was CR+IMF and ORIF with wire osteosynthesis, necessitating an average of 6 weeks of IMF for satisfactory healing. However, in recent years open reduction and internal fixation is the preferred treatment method of mandibular fractures but at the same time it is very expensive and needs an experienced surgeon to get the optimum results.[8] With this in mind, the author has conducted this prospective study to achieve the objectives of restoration of pre-existing anatomical form, functional occlusion and facial esthetics with the simplest treatment modality.

Materials And Methods

This cross-sectional study was conducted in the plastic surgery department of Pakistan Institute of Medical Sciences (PIMS), Islamabad. All the patients, regardless of age and sex, with maxillofacial trauma who had well documented fractures of the mandible, admitted through emergency or out-patient department (OPD) and who were treated surgically were included in this study. One hundred and ten patients participated in this clinical study during 1 ½ -year period from 1st July 1999 to 31st December 2000. Five patients had an insufficient postoperative review time (less than 6wks) therefore these patients were omitted, leaving 105 patient's data to be analyzed. 85.7% of patients were male; the mean age was 27.3 years with an age range of 4-75 years.

Fractures of the mandible were diagnosed on the bases of history, clinical examination, and radiographs. Anteroposterior, lateral, and orthopantogram (OPG) were the standard radiographs used to diagnose the fractures. The clinical data of each patient was recorded on a performa. The preoperative patient variables of age, sex, mechanism of injury, site and number of fractures, dentition, presence of teeth in the fracture site, nerve function, associated injuries, and delay in treatment were recorded. Any relevant medical history notably drug use, diabetes mellitus, hypertension, ischemic heart disease was also noted. Patients were allocated to three groups according to the surgical technique used.

Group I: 35 patients CR+IMF using 2.7-mm cortical bone crews, arch bars, and Ivy loops.

Group II: 20 patients Non-rigid osteosynthesis using Transosseous Wire (TOW), Kirschner wire (K- wire), and external pin fixation (EPF)

Group III: 50 patients Rigid/Semi-rigid osteosynthesis using bone plates and screws.

The following postoperative variables were assessed and analyzed in each patient in the follow-up period.

Duration of admission
Duration of intermaxillary fixation (IMF)
Malunion
Infection
Nonunion
Mental nerve function, and
Facial nerve damage

Operative Technique

Eighty-nine patients (84.8%) were operated under general anesthesia and 16 patients (15.2%) were treated under local or regional anesthesia. In 98.9% of patients general anesthesia was administered through nasotracheal intubation and a nasogestric feeding tube was routinely passed at induction of anesthesia and secured with a silk suture to the membranous nasal septum along with the nasotracheal tube. Vasoconstrictive solution, lignocaine with adrenaline (1:200,000) was routinely infiltrated into the incision line preoperatively. Hydrogen peroxide mouth washes and antibiotic cover (500 mg cephradine and 500 mg of metronidazole 8 hourly intravenously) were administered preoperatively and continued for a minimum of 24 hours postoperatively.

Temporary IMF was applied in open reduction and internal fixation (ORIF) cases for aiding occlusion. The fracture site was exposed via a labial or buccal mucoperiosteal flap. In ORIF group 67.2% of cases were operated by an oral approach, 15.7% by an extra-oral approach, and 17.1% of cases required a combined approach. In combined approach fracture sites were exposed intra-orally and small skin incisions were used for percutaneous placement of screws to facilitate fixation of bone plates. In extra-oral approach a 4-5 cm submandibular incision was used to expose the mandible and a great care was taken to preserve the mandibular branch of the facial nerve.

Standard techniques of fixation (Spiessl[9] and the AO/ASIF[10] -Association for Osteosynthesis/Association for the Study of Internal Fixation) were used to place hardware in group III patients. Teeth present in fracture line were removed at the time of surgery. Dislocated condylar fractures were treated by ORIF via pre-auricular incision extending into the temporal hair-bearing region, preserving the facial nerve and its branches.

Inter-maxillary fixation (IMF) was maintained postoperatively for all groups for various periods of time (1-6 wks) dependent on the method of osteosynthesis and presence of concomitant non-fixed fractures. Patients

were given dietary and oral hygiene advice postoperatively.

Patients were followed up every 1-2 weeks time for a minimum period of 2 months. The period of follow up was extended if there were complications. A senior resident or consultant assessed postoperative patient variables clinically. Anteroposterior or OPG radiographs were used only where deemed necessary. Clinical review continued for at least 2 weeks post removal of IMF, at which time screws, arch bars, or Ivy loops were removed. Soft diet was recommended for 2- 4 additional weeks. Fixation removal was performed as indicated due to clinical factors such as, patient request, persistent pain, and infection. Routine removal of implant was not carried out.

The data was analyzed on SPSS statistical package by a statistician. The descriptive variables were analyzed using a Chi-square test. The measurement variables were tested with one-way analysis of variance. A 'P' value <0.05 was considered to be significant.

Results

The results were reported on a total of 105 patients with 174 mandibular fractures, of which 91 were fixed with bone plates and screws, 29 were treated with non-rigid osteosynthesis techniques, and 54 fractures were treated with CR+IMF (Fig I).

The mean age of patients was 27.3 years with an age range of 4-75 years. 85.7% of the 105 patients were male, with male to female ratio of 6:1. There was an average of 1.6 fractures per mandible. The etiology of mandibular fractures was divided into seven categories (Table I). In 60.9% of cases, road traffic accidents (RTA) were the etiology, followed by fall and missile injuries. Regarding fracture location, parasymphyseal fractures were most prevalent (29.3%), followed by body (20.1%), angle (16.1%), condylar (11.5%), symphysis (10.4%), ramus (8.6%), and dentoalveolar (4%) fractures (Fig II). The coronoid fractures were not diagnosed in any of the 105 patients. 43.8% of patients had single mandibular fractures, 47.6% had double fractures and the most common site for these were a parasymphyseal fracture with a contralateral angle fracture (16.2%), followed by symphyseal or parasymphyseal fracture with a contralateral condylar fracture (10.5%). 16% of fractures in the rigid, 15% in the non-rigid, and 11.4% in the IMF groups were compound extra-orally. Comminuted fractures were seen in 12% of rigid and 10% of the non-rigid groups.

Sixteen patients (15.2%) had a head injury, 17.2% had an orthopedic injury, 10.5% a simultaneous maxillary fracture, and 8.6% of the patients had panfacial fractures. One patient had diabetes mellitus, 2 were hypertensive, and two had ischemic heart disease. None of the patients was found to be drug or alcohol addict. 95.2% of the patients were dentate.

Regarding treatment modalities, out of 75 fractures in the rigid group that were fixed, 33 reconstruction plates (RP), 12 dynamic compression plates (DCP), 10 mini-plates (MP), and 20 lag screws were used. In the non-rigid group, out of 29 fractures, 10 were fixed with K-wires, 17 with TOW, and 2 were managed with external pin fixation (EPF). In the CR+IMF group, 20 patients were treated with bicortical intermaxillary fixation screws, 10 patients with arch bars, and 5 patients were treated with Ivy loop indirect interdental wiring. 16 concomitant undisplaced fractures in group III were not fixed and managed with IMF. These were mainly subcondylar, ramus, and angle fractures. Only 25% of the condylar fractures were treated with open reduction and internal fixation. 52.4% of patients were treated within one weak following trauma. Only 9.5% of patients were treated within 24 hours after injury. In rest of the patients the treatment delay was more than 1 week.

Age, gender, etiology, fracture site distribution, mental nerve function, and delay in treatment were all similar for the three groups. One preoperative variable (comminuted fractures) was not statistically similar. Group II and III had a higher number of comminuted fractures as compared to group I.

Comparision of Postoperative Variables (Table II)

Occlusion was assessed postoperatively in all the patients by the consultant or by senior resident. Analysis of treatment outcome showed that in 90% of patients, functional occlusion was restored. Rigid fixation (Group III) resulted in malocclusion in 4 (8%) of the patients in comparison to 2 (10%) in the non-rigid (Group II), and 3 (8.6%) in the CR+IMF group. There was no significant difference between the three groups (P = 0.24). None of these patients required further surgery to correct this malocclusion. Most of these patients had associated condylar fractures. Only 5 patients (4.7%) required corrective occlusal adjustments with rubber elastic bands, the remainder resolved at later review.

Infection was seen in 4.8% of patients occurring 1-6 weeks following operation. It was mainly soft tissue infection, manifested by abscess formation or discharging sinus. Frank osteomyelitis was not recorded in any of the cases. Only 1 case of infection (2.8%) recorded in IMF group, 2 (10%) in the non-rigid, and 2 (4%) in the rigid groups. The difference was significant statistically (P=0.012). None of the two infected cases in the rigid group required removal of implant. In the non-rigid group one patient required removal of wires. Rest of the cases was treated conservatively.

Delayed union (excessive mobility of the fracture site 4 weeks post treatment) occurred overall in 4.8% of patients. All progressed to satisfactory union without further surgical intervention. Malunion occurred in 2 patients (5.7%) in group I, 1 (5%) in group II, and 1 (2%) in group III. These 4 patients had multiple fractures and undisplaced fractures were treated conservatively. Only 1 patient in the rigid group (III) was re-operated for malunion. No case of non-union was recorded. There was satisfactory bone healing in 100% of cases. This difference of malunion was not significant statistically (P=0.26).

Mental nerve function was routinely assessed in the follow-up period. Five patients (4.7%) had persistent mental nerve paresthesia, 1 (5%) in group II, 4 (8%) in group III, and none of the patients in group I. A significantly higher incidence (8%) of iatrogenic nerve damage occurred in group III (P = 0.007).

Weakness of the marginal mandibular branch of the facial (VII) nerve was significantly higher (4%) in the rigid group (P = 0.0001). None of the non-rigid group (II) had this complication. It was usually associated with an extra-oral approach.

IMF was used in 58% of patients of group III, and 80% of group II. In group III this was necessary for concomitant non-fixed fractures, or when fracture was treated with semi-rigid fixation technique. 85.7% of patients of group I had 4 weeks or more IMF as compared to group II (75%), and group III (40%). The duration of IMF was significantly shorter for group III (P = 0.002). Hospital stay was over 3 days in 40% of group I, 90% of group II, and 88% in group III. Duration of admission was significantly shorter (P = 0.001) for group I.

Fixation (plate or wire) removal was not undertaken routinely. Eight plates in 5 patients were removed in the rigid group, and three K-wires in 3 patients were removed in the non-rigid group. Ten patients (9.5%) required re-admission, 8 for fixation removal, 1 for malunion, and 1 patient was admitted for soft tissue infection. Overall the complication rate was low of group I.

Discussion

In the management of facial injuries and fractures it is the obligation of the physician to return the patient to his normal function and appearance, or as near to the normal as possible. In most of the cases function as well as appearance and esthetics has to be considered. In a competitive society economic and sociologic factors make it necessary that an aggressive and expedient program be adapted to return the patient to an active, productive life as soon as possible with minimal cosmetic and functional disability.

There are many ways to implement the principles of reduction and fixation.[10] Methods vary considerably with the patient and with the training and skill of the surgeon. Generally, the method of choice should be one that offers the simplest direct approach to successful reduction and fixation[11]. Most of the fractures can be treated adequately by CR + IMF, but in our experience superior results have been achieved in more serious injuries by open reduction and internal fixation[8].

The method of IMF for treating mandibular fractures is simple, easy to learn, and still widely practiced in most of the maxillofacial surgery units.[12] The method of IMF employed in our department has changed over the years. Currently IMF utilizing intraoral cortical bone screws is the preferred method over arch bar and Ivy loop techniques.[13] The reason is that it is very easy to apply and remove the screws. The operating time is significantly reduced from 45 minutes for IMF with arch bars or Ivy loops to 10 minutes for IMF with screws. Moreover, it is equally applicable in patients with teeth and those without teeth with increased patient comfort and tolerance, and the surgeon is less exposed to infectious diseases by skin punctures as compared with arch-bar and wire techniques of IMF. On the other hand difficulties associated with prolonged period of immobilization include airway problems, poor nutrition, weight loss, poor oral hygiene, difficulty in speaking, social inconvenience, patient discomfort, work loss, and difficulty in recovering normal range of jaw function.[14]

Recently the trend is towards open reduction and rigid/semi-rigid internal fixation.[8,15] The rigid internal fixation (RIF) is highly technique sensitive and demanding. A lot of experience and skill is required to apply the plates properly.[16] Errors in fixation will result in permanent malocclusion. At the same time, the advantages of the RIF include early mobilization, and restoration of jaw function, airway control, improved nutrition and speech, better oral hygiene, great patient comfort, and an earlier return to the workplace.[17]

Principles and techniques of RIF were developed and popularized as a result of research conducted by the AO/ASIF[10] in Europe in the 1970s. The basic principles of the AO were outlined by Spiessl.[9] RIF leads to primary bone healing which occurs when axial compression yields tight approximation of the fragments at the fracture site, promoting direct extension of osteocytes across the small bone gap.[18] This type of primary bone healing occurs without formation of any intermediate callus, thereby shortening the time period for remodeling and consolidation. When extra-oral approach is used the method of ORIF, however, is associated with increased operating time, risk of facial nerve damage, and hypertrophic scar formation.[16]

The concept of adaptive or semirigid fixation was developed by Michelet et al[19] and Champy et al[20] in France again in 1970s. In this type of fixation a small gap between the bone ends exists which means that a limited amount of primary callus forms. In this type of fixation miniplates are applied close to the tension zone (near the teeth) of the mandible. Monocortical screws are used to avoid injury to the roots of the teeth and alveolar nerve. However, a variable period of IMF is required with this type of fixation.

Lag screw is another form of compression osteosynthesis, which has been commonly practiced in our unit. This technique was introduced to maxillofacial surgery by Brons and Boering[21] in 1970. The major advantage of this technique is that lag screws permit more rapid application of fixation than bone plates without diminishing the rigidity of the fracture reduction. Lag screws, when applied perpendicular to the fracture, even provide more rigidity than do bone plates.[22] This is also a cost effective technique since the screws cost little as compared to the cost of a bone plate. This technique is useful only for anterior mandibular fractures.

Non-rigid osteosynthesis utilizing intra-osseous wires, K-wires or EPF has not been practiced commonly in our unit. The number of patients treated by this technique is less as compared to IMF or RIF techniques. A prolonged period of IMF is required. Wire osteosynthesis is associated with higher complication rate as compared to IMF or RIF. The reported rate of infection of mandibular fracture treated with conventional methods is between 4.4 and 17%. We recorded 10% infection rate with wire osteosynthesis compared with 2.8% with IMF and 4% with bone plates. This compares favorably with other studies (Table II).

In our study the rate of malocclusion with CR + IMF is 8.6%. This is not significant statistically between the three groups (P = 0.24). However, the rate of infection (10%) is significantly higher in the group II (P = 0.012). Predisposing factor for infection in this group is the comminuted and contaminated fractures treated with TOW and K-wires with increased mobility at fracture site.[23] Mezitis et al[7] reported an infection rate of 2.5%, and malocclusion of 3.5% with IMF. The higher malocclusion rate in our study may be due to the fact that we treated multiple significantly displaced fractures with IMF in patients with poor socioeconomic status.

The infection rate with bone plates (RIF) has been reported to be between 6 and 32%. Iizuka et al[24] reported a postoperative infection rate leading to plate removal of 6.1%, and primary bone healing of 93.9% without IMF. Kearns et al[16] reported an infection rate of 6.2%, and a primary bone healing rate of 93.8% with a week of IMF. Ellis et al[22] have reported an infection rate of 13% with lag screws, 17% with wire osteosynthesis plus IMF, and 7.5% infection rate with an AO reconstruction plate without IMF. He concludes that the interfragmentary compression generated by DCP causes bone devitalization and subsequent necrosis. He advocates the use of AO reconstruction plates in comminuted and infected fractures. In our study the rate of infection, and of other complications of RIF, is comparable with other international studies (Table III), except numbness of the inferior alveolar nerve, which is higher (8%) than other studies. The incidence of facial nerve damage (4%) in this study was in agreement with the reported incidence of 0-12% in the literature.[7]

In this study males, between age group 21-30, accounted for most of the cases. Road traffic accidents (RTA) were the cause of fracture in 60.9% of cases and out of these 50% were motorcyclist. A significant number of patients, particularly females and children, suffered from RTA while crossing the road. These findings are constant with locally and internationally reported facts except etiology of fracture. In the western world compulsory use of seat belt and helmet by law have resulted decrease in severe injury, particularly, of facial region. In our country the legislation regarding compulsory use of seat belt, wearing of helmet, and implementation of traffic laws in general has been ineffective. In the European countries interpersonal violence (assault) is the leading cause of mandibular fractures.[25]

Analysis of treatment outcome showed that in 90% of cases functional occlusion was restored. Overall RIF, although it is an

expensive and time-consuming method to learn and apply, is of great benefit to patients as they can use their mouths normally after operation and return to their jobs quickly. RIF is more reliable in avoiding postoperative use of IMF than semi- or non-rigid osteosynthesis. However, postoperative malocclusion is more difficult to correct in RIF.

Conclusion

Based on the results of this study we concluded that a brief period of IMF helps to stabilize the occlusion by immobilizing fracture segments, allows reattachment of the soft tissue drape and promotes initial bone healing. All the three surgical techniques were successful in restoring functional occlusion. Rigid internal fixation with lag screws is reliable, efficient, and cost-effective technique for anterior mandibular fractures. In experienced hands RIF is the method of choice, particularly, for grossly displaced or comminuted fractures with or without bone loss. Overall CR+IMF with 2.7-mm cortical bone screws is the simplest, less invasive, efficient and cost-effective technique in treating most of the mandibular fractures. Ultimately the plan must be individualized according to the fracture, the patient, and the preference of the surgeon to maximize success rate while minimizing complications that may be physically and psychologically devastating to the patient.

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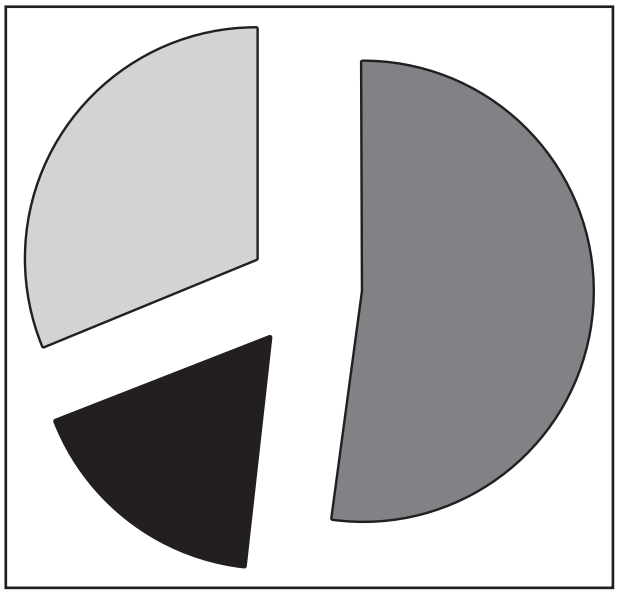
Figure I. Distribution of Fractures in Treatment Groups (data in percentages)



CR+IMF 31%

Rigid fixation 52%

Non-rigid fixation 17%

CR= Closed Reduction, IMF= Intermaxillaey Fixation

Table I. Etiology of Injury

Etiology	No. of patients	%
RTA	64	60.9
Fall	15	14.3
FAI	8	7.6
Assault	5	4.8
Industrial	8	4.8
Sports	4	3.8
Others	4	3.8

No = Number, RTA = Road Traffic Accident, FAI = Firearm Injury

Figure II. Site Distribution of Fractures (data in percentages)

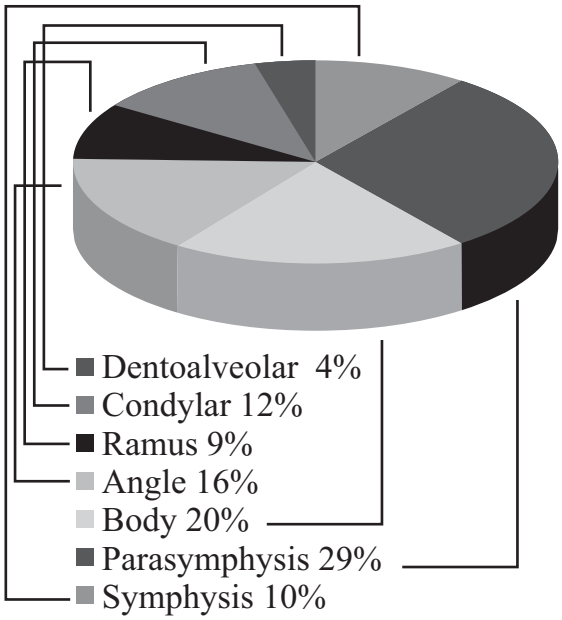


Table II. Comparison of Postoperative Variables

	CR+IMF no = 35	Non-rigid Osteosynthesis no = 20	Rigid Osteosynthesis no = 50	Total 105	%
Infection	1 (2.8%)	2 (10%)	2 (4%)	5	4.8
Malocclusion	3 (8.6%)	2 (10%)	4 (8%)	9	8.6
Malunion	2 (5.7%)	1 (5%)	1 (2%)	4	3.8
Mental Nerve Dysfunction	0	1 (5%)	4 (8%)	5	4.7
VII N Damage	0	0	2 (4%)	2	1.9
IMF>4wks	30(85.7%)	15 (75%)	20 (40%)	65	61.9
Inpatient >3 days	14 (40%)	18 (90%)	44 (88%)	76	72.4

no = Number, CR = Closed Reduction, IMF = Intermaxillary Fixation, VII N= Facial Nerve

Table III. Comparison of RIF Results with Other RIF Studies (Data in % of patients)

Study	Year	No	Infect-ion	Malocclusion	Malunion/ Nonunion	MN damage	VII N damage
Mezitiset al[7]	1996	443	3.4	3.4	1.5	0.5	3.5
Fardyc et al[17]	1996	88	2.3	4.7	-	-	7.9
Ellis[22]	1997	315	13	4	1	-	-
Lazow[11]	1997	155	3.9	-	1	-	0
Abbas et al[3]	2000	14	0	0	0	0	0
Anwar et al	2001	50	2	4	1	4	2

RIF = Rigid Internal Fixation, No = Number, MN = Mental Nerve, VII N = Facial Nerve