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Treatment modality outcomes of fracture mandible in child and adult patients.

مخرجات طرق علاج كسر عظم الفك الأسفل عندا لمرضى الأطفال و الكبار

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Abstract.

The pediatric mandible fracture is a rare occurrence when compared with the number of mandible fractures that occur within the adult population.

Aims. The purpose of this study was to study the treatment outcomes of fracture mandible in child and adult patients.

Patients and methods One hundred forty three patients who sustained mandibular fractures were included in this study one hundred tow (71.33%) were adult patients (sixty five were male and thirty seven patients were female) The general procedure for treating a fractured mandible is first to immobilize the jaw and set the break - "reduction." Often, a surgeon can set the bone simply by manually repositioning it "closed reduction" because it can be done through the skin and does not involve major surgery. Once the bone is set, the jaw must be stabilized and kept stationary for a period of time, to allow the broken segments to grow back together. "fixation," may involve wiring the jaw shut for two to six weeks,

Results . one hundred two (71.33%) were adult patients (sixty five were male and thirty seven patients were female) average age of patients was between 16 -75 years and forty one (28.67%) patients were child age between 3- 12 years (twenty six child were male and fifteen were female).

Conclusion. Twenty five patients (17.48%) were presented with complication post operatively from total number one hundred forty three, other reported that complications occurred in 19.8% of the patients.

Key wards: treatment outcome, fracture mandible in child and adult patients.

الخلاصة

كسر عظم الفك الأسفل عند المرضى الأطفال قليل الحدوث مقارنة مع إعداد كسر عظم الفك الأسفل التي تحدث لفئة الكبار، الهدف من الدراسة هو معرفة نتائج العلاج لكسر الفك الأسفل عند المرضى الأطفال و الكبار.

المرضى و طرق البحث،مائة و ثلاث و أربعون ممن يشكون كسر عظم الفك الأسفل،مائة و مريضين(71. 33%) مرضى كبار (خمسة و ستون كانوا ذكور و سبعة و ثلاثون مرضى إناث. الطريقة العامة في العلاج هي أولا عدم السما ح بحركة عظم الفك و إرجاع الكسر إلى مكانة وبعض الأطباء يعمله ببساطة و يسمى الإرجاع المغلق بسبب إمكانية عملة من خلال الجلد الخطوة الثانية عملية التثبيت لفترة من الوقت للسماح للعظم المكسور للنمو و التثبيت يكون بواسطة الربط بالوا ير لمدة من أسبوعان إلى ستة أسابيع.النتائج أظهرت إن أعمار المرضى كان يتراوح بين16 -75 عام الكبار اما المرضى الأطفال فيتراوح أعمارهم بين 3- 12 سنة ستة و عشرون ذكرا و خمسة عشر أنثى. .

خلاصة الدراسة بينت الدراسة ان خمسة و عشرون مريضا كان علاجهم مقترن بمضاعفات من مجموع مائة و ثلاث و أربعون . 19.8%مقارنة مع دراسات منشورة (17.48%)

Introduction

The mandible, or lower jaw, is the most frequent site of fracture on the face. Even though it is a very strong bone, its prominent position on the face makes it particularly vulnerable. Mandibular fractures are the most common facial skeleton injuries in pediatric trauma patients [1].The general principles of treating mandibular fractures are the same in children and adults. The pediatric mandible fracture is a rare occurrence when compared with the number of mandible fractures that occur within the adult population[2]. Greenstick fractures are incomplete fractures of flexible bone, and for this reason typically occur only in children. This type of fracture generally has limited mobility[3].The bone of the mandible can be divided into the following components, coronoid, condyle, ramus, angle, body, parasymphysis , symphysis and alveolus. The weakest sites are the third molar area, socket of the canine tooth, and the condyle. The arterial supply of the mandible is from the internal maxillary artery from the external carotid with contributions to the inferior alveolar artery through the mandibular foramen and the mental artery through the mental foramen. Innervations of the mandible is from the mandibular nerve through the foramen ovale with contributions to the inferior alveolar nerve through the mandibular foramen, inferior dental plexus and the mental nerve through the mental foramen[4].

Fractures of the facial bones and mandible are uncommon in children younger than five years of age , the incidence increases with increasing age and peaks between 16-20 years[5].Mandibular fractures can cause serious swelling, they can inhibit movement in the jaw, and they can cause changes in the contour and structure of the jaw (for example, a change in the alignment of the teeth). One of the main aspects of treating a broken jaw involves making sure the alignment of the teeth returns to normal. The fracture can occur at different parts of the bone, depending on what angle the mandible has been impacted. Also, because of the mandible's rounded shape, a traumatic injury may cause the mandible to fracture in more than one place[1]. Treatment of these fractures is by wiring, plating, wiring upper and lower jaws together (intermaxillary fixation), or a combination of the above. Certain fractures may require only soft diet and pain relievers. Special dental treatment plans may be required for children.

Treatment options of mandible fractures include no treatment for isolated nondisplaced fractures of the coronoid process. These fractures need to be reduced when the fracture fragment is impinging on the zygoma and the patient is unable to open his mouth. A soft or liquid diet and pain control may be the only treatment necessary for a unilateral nondisplaced fracture of the subcondylar area with normal occlusion. If the patient develops malocclusion and/or persistent pain, he needs to be managed with mandibulomaxillary fixation(MMF). Classical indications for closed reduction (MMF) include grossly comminuted fractures which heal better with the periosteum intact. Open reduction can lead to damage of the developing teeth in children. A condylar fracture treated with open reduction can lead to damage of the temporomandibular joint. These fractures are also classically treated with MMF. MMF is contraindicated in epileptics, alcoholics, psychiatric and frail patients who can not tolerate there jaw wired shut[3].

Complications of pediatric facial fractures are rare overall and occur mainly in cases of severely comminuted and displaced fractures [6]. A growth disturbance secondary to a severe fracture (especially a fracture through a vulnerable structure such as suture lines, and mandibular condyle) occurs in about 15% of pediatric patients with a facial fracture [6,7].Asymmetry may result from the overgrowth or undergrowth of bone. The risk of a growth disturbance should be considered when planning treatment. That risk is not as great in older children, since the facial skeleton is almost fully developed and permanent dentition is nearly complete; fortunately, the most severe fractures (ie, those that require surgery) occur in this group. Facial fractures in children may be complicated by a disturbance of normal dental development, especially during the deciduous and mixed dentition phases. Ankylosis of the temporomandibular joint occurs in 1%–7% of condylar fractures [6,8] .IMF can cause avulsion of the primary teeth which are not sufficiently stable due to the pressure exerted. Furthermore, the conical shape of the primary teeth, with their wide cervical margins and tapered occlusal surface, makes the placement of these IMF devices or eyelets technically challenging [9].The wires themselves are uncomfortable and damage the periodontal tissues [10].

However, some authors have indicated that IMF using arch bars is safe in children, especially those older than 9 or even 11 years [11]. Regarding Late complications such as damage to permanent teeth, which may occur in 50% of mandibular fractures, TMJ dysfunction (recurrent subluxation, noise and pain, limited condylar translation, deviation on opening, ankylosis) and growth disturbances (e.g. secondary midface deformity, mandibular hypoplasia or asymmetry) usually occur only in pediatric patients with severely comminuted fractures [10], Malocclusion as a complication of pediatric facial fractures is rare [12].It has been attributed to short fixation times in alveolar fractures and may be caused by growth abnormalities after condylar fracture [13].Spontaneous correction of malocclusion is seen as deciduous teeth shed and permanent teeth erupt [10].

Furthermore, Ellis et al.[14] did not find occlusal complications associated with the use of closed treatment and IMF, Lois et al.[15] found no difference in the complication rate of fractures treated by mandibulomaxillary fixation versus open reduction and internal fixation (4.3% and 5.45%, respectively).They concluded that in fractures with displacement in the range of 2–4 mm, there is no difference between mandibulomaxillary fixation and open reduction/internal fixation.

The purpose of this study was to study the treatment outcomes of fracture mandible in child and adult patients.

Patients and methods.

One hundred forty three patients who sustained mandibular fractures were included in this study one hundred two (71.33%) were adult patients (sixty five were male and thirty seven patients were female) average age of patients was between 13 -59 years and forty one (28.67%) patients were child age between 3- 12 years (twenty six child were male and fifteen were female),from October 2008 up to June 2014, The management started with immediate resuscitation following the principles of advanced trauma life support (ATLS).Plain anteroposterior(AP),lateral cephalometry radiograph, Orthopantomogram (OPG) were obtained for all patients and / or CT scan were obtained some times. An accurate assessment of the fractures was performed including the site and type of fracture, amount of displacement, amount of pain or discomfort, paraesthesia in the distribution of inferior alveolar nerve, marginal mandibular nerve paresis, status of dental occlusion, any associated temporomandibular joint (TMJ) dislocation, or any other functional deficits. All the selected patients were entailed about the surgical procedure, includes, reduction, fixation and immobilization with the same goals of restoring esthetic and function. inferior alveolar nerve injuries associated with mandibular fractures. The etiologies of mandibular fractures were trauma, road traffic accident, altercation and assaults, falls, industerial or work related injuries, missiles injuries, sports and other causes. They were informed about the surgical procedure including prognosis, potential hazards and complications. Patients were followed up for at least four to six months post treatment , they gave their approval to participate in a written informed consent. The study protocol was reviewed and approved by the central regional ethics committee at kufa university.

methods.

The general procedure for treating a fractured mandible is first to immobilize the jaw and set the break - "reduction." Often, a surgeon can set the bone simply by manually repositioning it "closed reduction" because it can be done through the skin and does not involve major surgery. Once the bone is set, the jaw must be stabilized and kept stationary for a period of time, to allow the broken segments to grow back together. "fixation," may involve wiring the jaw shut for two to six weeks. Treatment of fracture mandible in child patients.1.Twenty three child presented with fracture mandible treated by conservative treatment for body and angle fractures frequently are green stick fractures and are managed with soft diet and pain control. Conservatively manage comminuted fractures of the head and condyle. In the edentulous child, no immobilization is required; Even if displaced, the fracture typically heals well [6]. 2.Thirteen child presented with non displaced or if only minimal-to-moderate displacement exists, closed reduction and IMF or IMF with elastics usually suffices [16]. Indications for jaw immobilization are bilateral fractures with an open bite or severe movement limitation or deviation. Generally, the period of immobilization is 2-3

weeks followed by a period of 6-8 weeks of guiding elastics to counteract the force of the masseter-pterygoid sling, which pulls the inferior border of the mandible superiorly and tends to shorten the ramus. 3.Five child were treated by open reduction which was indicated in a few situations as follows: (1) dislocation of the mandibular condyle into the middle cranial fossa, (2) condyle prohibiting mandibular movement, and (3) bilateral condylar fractures causing reduced rami height and open bite (although some advocate immobilization alone)[16].patients were followed up for at least three months post operatively.

Modalities of treatment of fracture mandible in adult patients.

1. Thirty patients presented with Simple fractures are usually treated with closed reduction and indirect skeletal fixation, maxillo-mandibular fixation (MMF) and If the patient develops malocclusion and/or persistent pain [17],The indirect skeletal fixation is accomplished by placing an arch bar, secured to the teeth on the maxillary and mandibular dentition, then securing the top and bottom arch bars with wire loops.
2. Seventeen patients presented with fracture mandible were treated by closed reduction with direct skeletal fixation follows the same premise as MMF except that wires are passed through the skin and around the bottom jaw in the mandible and through the piriform rim or zygomatic buttresses of the maxilla then joined together to secure the jaws. The option is used when a patient is edentulous (has no teeth) and rigid internal fixation cannot be used.3.Fifty fife patients presented with fracture mandible were treated by Open reduction with direct skeletal fixation allows the bones to be directly mandipulated through an incision so that the fractured ends meet, then they can be secured together either rigidly (with screws or monocortical bony mini plate osteosynthesis and screws. or non-rigidly (with transosseous wires).

Results.

One hundred forty three patients who sustained mandibular fractures were included in this study one hundred tow (71.33%) were adult patients (sixty five were male and thirty seven patients were female) average age of patients was between 16 -75 years and forty one (28.67%) patients were child age between 3- 12 years (twenty six child were male and fifteen were female),from October 2008 up to June 2014.

Modalities of treatment of fracture mandible in child patients.1.Twenty three child aged between 3-6 years presented with fracture mandible treated by conservative treatment for body and angle fractures frequently are green stick fractures and are managed with soft diet and pain control .the fracture heals well after four weeks with follow up weekly. Regarding complication one child was presented with infection which was complaint of bilateral fracture mandible treated by copious irrigation with normal physiological saline daily ,child covered with systemic antibiotic amoxicillin suspension 250 mg three times daily for five days , instruct parents to feed child light diet and maintain good score of oral hygiene child become better after treatment.

2.Thirteen child presented with non displaced or minimal-to-moderate displacement exists, closed reduction and IMF for two weeks only or IMF with guiding elastic for four weeks with follow up weekly, with instruction child parents for good oral hygiene. three child patients presented with complication, one child loss lower left deciduous lateral, parents instruct to maintain child oral hygiene good and analgesia was prescribed in need, second case suffered from TMJ pain syndrome treated by analgesia and early exercise daily with daily follow up, third case of complication presented with limitation of mouth opening ,parents instruct for early exercise every hour with follow up daily and reassurance of parents regarding complication and to help child for multiple times to do exercise, child get improvement and become happy With the family.3. Five child were treated by open reduction by using fixation with mini plate 2.0 mm/screw mono cortical type system , mini plate was extracted after four months with thick bone cover. one child presented with signs and symptoms of infection at the site of mini plate, which was treated by irrigation with normal saline daily and patients covered with amoxicillin suspension 250 mg three times daily for five days until signs and symptoms of infection was disappeared, second case child presented with

dehiscence and exposure of bone mini plate steosynthesis, frequent irrigation with normal saline daily and maintain good and proper oral hygiene until healing and covered with fibrosis.

Modalities of treatment of fracture mandible in adult patients. 1.Thirty patients presented with Simple fractures are usually treated with closed reduction and indirect skeletal fixation, maxillo-mandibular fixation (MMF) The indirect skeletal fixation is accomplished by placing an arch bar, secured to the teeth on the maxillary and mandibular dentition, then securing the top and bottom arch bars with wire loops for 4-6 weeks with instruction the patient for good oral hygiene and weekly follow up. Four patients presented with complication post maxillo-mandibular fixation ,one case complaint of infection treated by irrigation by chlorhexidine mouth wash many times daily with systemic amoxicillin 500 mg injection two times daily for fife days and gradual improvement, second case presented with limitation of mouth opening after six weeks fixation, patient instruct for early exercise and active mobilization with assurance, then patient after fife days open mouth with normal vertical opening 30 -32 mm . third case presented with TMJ pain syndrome ,patient received analgesia and encouraged patient for exercise. fourth case presented with disturbance of nerve function of inferior dental nerve before treatment due to marked displacement of two part of fracture body of mandible ,electromyography was recorded before treatment, patient received course of physiotherapy ,parasthesia was gradually improved and after 55 days patient fell excellent recovery.

2.Seventeen edentulous patients presented with fracture mandible were treated by closed reduction with direct skeletal fixation follows the same premise as MMF except that wires are passed through the skin and around the bottom jaw in the mandible and through the piriform rim or zygomatic buttresses of the maxilla then joined together to secure the jaws. Regarding complication two patients presented with infection , treated by uses of copious irrigation with chlorhexidin many times daily with amoxicillin 500 mg injection two times daily for fife days with regular light diet both of two patients get improvement but with different interval. third case presented with limitation of mouth opening after the end of fixation, patient instruct for early exercise and active mobilization daily many times, then patient after seven days open the mouth with in normal average. Fourth case suffered from TMJ pain syndrome ,patient received analgesia and encouraged patient for exercise and improved score of oral hygiene. Fifth patients presented with mal union treated by irrigation of oral cavity and increased MMF for one week with checking the skeletal fixation radiologically after that complete healing. 3.Fifty fife patients presented with fracture mandible were treated by Open reduction with direct skeletal fixation allows the bones to be directly manipulated through an incision so that the fractured ends meet, then they can be secured together either rigidly (with screws or monocortical bony mini plate osteosynthesis and screws.Or non-rigidly (with transosseous wires). transosseous wires and monocortical bony mini plate osteosynthesis and screws were removed after six months with little bone cover. Ten patients were presented with early and late complication, three patient presented with infection at the site of bony mini plate osteosynthesis and monocortical screws, treated by copious irrigation with chlorhexidin many times daily and amoxicillin 500 mg injection two times daily for fife days then infection were gradually disappear. two cases complaint of bone miniplate osteosynthesie sensitivity, patient instruct not to use hot or cold or acidic food which may decrease hypersensitivity, patient through consent form know that bony mini plate osteosynthesis can be extracted after complete healing .two patients suffered from dehiscence and exposure of bone mini plate steosynthesis, frequent irrigation with chlohexidin daily and maintain good and proper oral hygiene until healing and covered with fibrosis. two cases presented with TMJ dysfunction, Deviation on opening, treated by insertion of arch bar for upper and lower jaws and IMF for one week and get better prognosis. one case complaint of limitation of lateral and protrusive mobility, treated by course of physiotherapy and instruct patient for doing massage and exercise daily and patient get improvement after three days.

Table (1) distribution of child patients by age and gender.

No	Male	Female	No. (%)
3-5 years	8	9	17 (41.46%)
6-8 years	5	3	8 (19.51%)
9-12 years	9	7	16 (39.03%)
Total	22	19	41 (100%)

Table (2) distribution adult patients by age and gender.

No	Male	Female	No. (%)
13-19 years	9	5	14 (13.73%)
20-29 years	26	17	43 (42.16%)
30-39 years	19	10	29 (28.43%)
40-49 years	7	3	10 (9.80%)
50-59 years	4	2	6 (5.88%)
Total	65	37	102 (100%)

P = 0.98

Table (3) distribution Child & adult patients with type of mandibular fracture.

	Unilateral Fracture.	Bilateral Fracture.	Number of Patients.	Number of Mandibular Fracture.
Child patients	35	6	41	47
Adult patients	83	19	102	121
Total	118	25	143	168

P value = 0.57

Table (4) distribution type of complication post treatment by number.

Type of complication post operatively	No. of child ≤ 12 years and adult > 12 years patients With complication
TMJ Pain syndrome	3
Infection.	8
Loss of deciduous teeth .	1
Non union and mal union.	1
Dehiscence.	3
Malocclusion.	0
Limitation of mouth opening.	3
Bone miniplate osteosynthesie sensitivity.	2
Occlusal mal alignment	0
Disturbance of permanent teeth.	0
Mandibular asymmetry.	0
Open bite.	0
Lateral and protrusive mobility.	1
TMJ dysfunction, Deviation on opening.	2
Nerve function disturbance.	1
Ankylosis.	0
Scar.	0
Total	25

Post operative complication we divided into tow type: Early complication are TMJ Pain syndrome, infection, loss of deciduous teeth, non union and mal union, dehescence, malocclusion, limitation of mouth opening, bone miniplate osteosynthesie sensitivity and occlusal mal alignment while late complication are disturbance of permanent teeth , Mandibular asymmetry, Open bite, lateral and protrusive mobility.,TMJ dysfunction, deviation on opening, nerve function disturbance, Ankylosis and Scar.

Table (5) distribution modalities of treatment by complication of child patients.

Modalities of treatment	No. of Child patients	No. of child ≤ 12 years patien With complication
Conservative	23	1 (4.347%)
Closed reduction & indire skeletal fixation 2-3 week	13	3 (23.076%)
Open reduction & direct Skeletal fixation –plate ar screws.	5	2 (40%)
Total	41	6 (14.63)

Table (6) distribution modalities of treatment by complication of adult patients.

Modalities of treatment	No. of adult patients	No. of adult > 12 years patients With complication
Closed reduction & indirect skeletal fixation 4-6 weeks	30	4 (13.33 %)
Closed reduction & direct skeletal fixation 4-6 weeks	17	5(29.41 %)
Open reduction & direct Skeletal fixation –plate and screws	55	10(18.181 %)
Total	102	19(18.62%)

Fig.(1) Three years age treated conservatively.

Fig.(2)Twelve years age with fracture mandible.

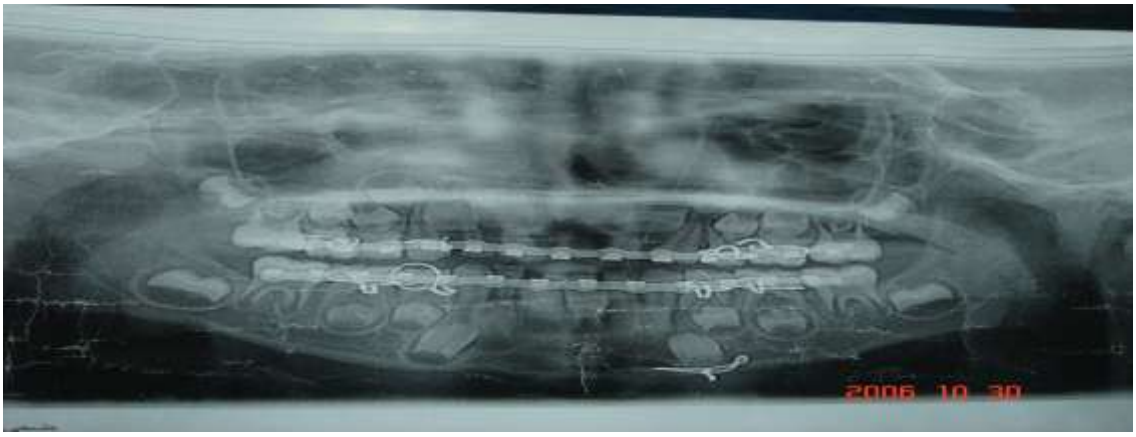

Fig.(3) Orthopantomogram of child patient treated by Closed reduction & indirect skeletal fixation 2-3 week

Fig.(4) PA view fracture condyler neck adult.

Fig.(5) lateral view fracture condyler neck adult

Fig.(6) Closed reduction & direct skeletal fixation 6-7 weeks adult .

Fig.(7) 3D CT image clearly depicts the extent of the fracture adult.

Fig.(8) Open reduction and internal fixation by bone mini plate osteosynthesis and screws.

Discussion

Pediatric fractures are unusual when compared with fractures in adults ,our result revels that male/ female ratio 8.7/5.6 which was in agreement with Marano Renato et al 2013 boys are more commonly affected than girls by a ratio of 2:1[18.] There are various options available for treatment of mandibular fractures, such as closed reduction and intermaxillary fixation, open reduction with intraosseous wires, and open reduction with mini-plates and screws for internal rigid fixation[19].the treatment of the fractures may be classified into conservative treatment or treatment by closed reduction. Our results reveals that twenty three child aged between 3-6 years treated by conservative treatment for body and angle fractures frequently are green stick fractures and are managed with soft diet and pain control ,the fracture heals well , followed up for four to six weeks , which were in agreement with Haug RH, Foss J 2000, Ferreira PC, Amarante 2005 reported that many pediatric fractures are non-displaced or greenstick-type fractures, and observation alone is adequate[20,8].There is almost no indication to open a fracture because the abundance of developing teeth in the bone makes fixation almost impossible without damaging these structures. A conservative approach (observation or closed reduction) is the best approach to consider first for pediatric mandible fractures, as these fractures heal rapidly, and the children grow normally. Our result was inagreement with Abbas A Younes 2012 reported that management options range from observation to open reduction and rigid fixation, depending on the clinical scenario. Greenstick and nondisplaced fractures can be managed with analgesics and soft diet. Keep patients on a soft or liquid diet. Although initial examination may reveal normal occlusion, 3-4 weeks of close follow-up

of these patients is important. Investigate any new symptoms or findings with new radiologic studies[16]. Regarding complication one child patient was presented with infection from total twenty three child patients,

Our results reveals thirteen child presented with non displaced or if only minimal-to-moderate displacement exists, closed reduction and IMF or IMF with elastics .the period of immobilization was 2-3 weeks followed by a period of 6-8 weeks of guiding elastics to counteract the force of the masseter-pterygoid sling, which pulls the inferior border of the mandible superiorly and tends to shorten the ramus, our results in agreement with Abbas A Younes 2012 reported that In children aged 5-8 years, deciduous molars may be used for fixation. In children aged 7-11 years, the primary molars and incisors can be used to anchor fixation. When adequate dentition is not available for fixation, Gunning splints may be used as in the younger patient. In children older than 9-12 years, standard intermaxillary fixation (IMF) with arch bars is possible because enough permanent dentition has been established. Braces may also be used briefly for fixation[6]. Rapid healing and the possibility of remodeling decrease the duration of immobilization necessary in the pediatric patient. 2-3 weeks to be adequate, The rapidity of healing also dictates that management of the fractures should occur early. Our results reveals that fife child were treated by open reduction by used fixation with mini plate 2.0 mm/screw mono cortical type system , mini plate was extracted after sex months with thick bone cover our results in agreement with Abbas A Younes 2012 [6].reported that If open reduction and fixation is required, use an intraoral approach, where possible. Place monocortical screws at the inferior border of the mandible to avoid damaging the underlying teeth. Eppley BL 2005[21,] Poore MC 2008[22] reported the use of resorbable polylactic and polyglycolic acid plates and screws in 14 patients with displaced fractures of the symphysis, parasymphysis, body, and ramus. Patients underwent open reduction and either 1.5-mm or 2.0-mm plate and screw fixation with no long-term implant-related complications. During management of pedatric patients we must think about many factors into consideration, age of child, site of fracture, type of treatment weather conservative or surgical approach, weather fracture mandible was accompanied with other fractures and degree of compliance. The high osteogenic potential of the pediatric mandible is responsible for a low complication rate. We seen thick bone cover after 6 months post operative miniplate insertion in comparison with adult patient may be due to high mitotic figure and high remodeling index, we prefer to extract miniplate and screws especially in child patients after four months duration. We believed that insertion of miniplate screws system with child patient must be put it at last choice in treatment plane and may be lead to damaging root of teeth and may affect facial growth and development especially child below six years, our results disagreement with Amit Khatri et al 2011[23] they reported that the use of absorbable plates and screws have nearly no side-effects on the growing facial skeleton but there is still the risk of damaging unerupted teeth during the drilling process, our results was in agreement with Justin C. Sowder et al 2013 [24] they reported that open reduction and internal fixation (ORIF) of mandible fractures with non-resorbable plates has been the preferred procedure in young children. Modalities of treatment of fracture mandible in adult patients. Our results reveals that thirty patients presented with Simple fractures or patient with malocclusion and/or persistent pain treated with closed reduction and indirect skeletal fixation, for 6-7 weeks with instruction the patient for good oral hygiene and weekly follow up. our results was in agreement with Karen L. Stierman, et al 2000 they reported that If the patient develops malocclusion and/or persistent pain, he needs to be managed with mandibulomaxillary fixation(MMF).[17] Our results reveals that seventeen edentulous patients presented with fracture mandible were treated by closed reduction with direct skeletal fixation , our results was in agreement with Karen L. Stierman et al 2000 [4],Edentulous patients may undergo closed reduction by wiring the patient's dentures to his jaws using circumandibular and circumzygomatic wires. Closed reduction with direct skeletal fixation follows the same premise as MMF except that wires are passed through the skin and around the bottom jaw in the mandible and through the piriform rim or zygomatic buttresses of the maxilla then joined together to secure the jaws. The option is sometimes used when a patient is edentulous (has no teeth) and rigid internal fixation cannot be used. Our results reveals that fifty fife patients presented with fracture mandible

were treated by Open reduction with direct skeletal monocortical bony mini plate osteosynthesis and screws. or non-rigidly (with transosseous wires). transosseous wires and monocortical bony mini plate osteosynthesis and screws were removed after six months with little bone, It seems that open reduction and rigid internal fixation lead to earlier return to the workplace , increased patient satisfaction, shorter periods of hospitalization and avoidance of MMF which lead to early functioning of the mandible which was in agreement with Pavan Kumar B et al [25]they reported that The use of noncompression monocortical miniplate fixation for osteosynthesis of mandibular fractures was introduced by Michelet et al 1973 [26], and further advanced by Champy et al [27] Miniplate osteosynthesis is accomplished by placement of a plate along the so- called ideal line of osteosynthesis, thereby counteracting distraction forces that occur along the fracture line by the supra hyoid group of muscles during mandibular function. In the mandibular angle region, this line indicates that a plate may be placed either along or just below the oblique line of the mandible. The mandible is different from other facial bones in some important respects. In addition to its contribution to facial dimension and symmetry, the mandible has unique and important functional features [28].

Complication of treatment modality. Twenty five patients (17.48%) were presented with complication post operatively from total number one hundred forty three, Marcelo Zillo Martini 2006[29] reported that complications occurred in 19.8% of the patients, Other studies reported complications in 13%[30]. Six child ≤ 12 years patients (14.63%) presented with complication and nineteen (18.62%) adult >12 years presented with complication may be due to the greater osteogenic potential and faster healing rate which was in agreement with Zimmermann CE 2006[1].Our results revealed that conservative treatment was best modality for child ≤ 12 years patients with less post operative complication (4.34%) which was in agreement with Goth S 2012[2],Amit Khatri 2011[23]reported that a conservative approach is the best approach to consider first for pediatric mandible fractures, as these fractures heal rapidly, and the children grow normally. our results revealed that closed reduction & indirect skeletal fixation 4-6 weeks for treatment adult >12 years patients was associated with less complication (13.33%) , Rahul Gupta [31] reported that closed reduction and IMF gives good results in the form of mouth opening, Kim YK,2002[32] reported that complications of treatment mandibular body fractures in children revealed a lower complication rate (9.1%) with closed treatment of mandibular body, angle, and parasymphyseal fracture, while open reductions using miniplate, mandibular plate and mandibular/miniplate fixation revealed a higher rate of complication (30%, 28.6%, 29.2% respectively). reduction & direct skeletal fixation 4-6 weeks for treatment adult >12 years patients was associated with high rate(29.41%) of complication post operatively. Regarding type of complication results revealed that infection was reported high number eight patients from twenty five patients, five patients were adult >12 years, our results in agreement with Dainius Razukevičius 2005 [33] reported that osteomyelitis ranks among the most common and most severe complications of fracture healing and according to the findings presented by Fox and Kellman 2003[34]. Ellis E.2002 reported that Inflammatory complications in cases of mandibular angle fractures amount to 5.9% to 15.8%[35].

Conclusion.

Treatment of pediatric fracture mandible must be attention not to interfere with growth ,development and eruption of teeth. Decrease duration of immobilization is necessary in comparison of adults patients due to rapid healing and the possibility of remodeling. pediatric mandibular fractures differ from treatment of the adult population in that a conservative approach is advocated in most cases and post operative complication were less associated with treatment of child in comparison with adult patients, closed reduction & indirect skeletal fixation weeks for treatment adult patients was associated with less complication post operatively.

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