Evaluation of open and closed treatments of displaced sub condylar fractures

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الخلاصة

تضمنت الدراسة خمس واربعون مريضا مصابون بكسر عظم الوجنة تم فحصهم سريريا و شعاعيا .

ان كيفية الاصابة في اربع وعشرين مريضا كانت اما اثر حادث مروري او بسبب شدة خارجية على الوجه بالقبضة.

تم تصنيف كسور عظم الوجنه حسب تصنيف نايت ونورث اعتمادا على الصور الشعاعية بمنظر قفوي ذقني بزاوية 45 درجة.

ثلاثة وعشرون مريضا ظهرت لديهم عدم استقرار الكسر بعد التعديل الاولي،وقد وجدنا تقلص العضلة الماضغة هو المسبب لانحراف الكسر المتاخر في العظام الغير مثبتة بشكل كافي ولهذا فان تثبيت العظم الوجني بواسطة الاسلاك المعدنية على الاقل في نقطتين تعتبر طريقة مقبولة لتجنب عدم تناظر جانبي الوجه وضمور العين.

تم استعمال طريقة كيليز في تعديل الكسور من النوع المستقر، لأعادة تصنيع قاع محجر العين تم استعمال ترقيع عظم ذاتي من عظم الحوض في ثلاثة مرضى ومادة صناعية (سايلاستك) في ثلاثة مرضى اخرين، وكانت نتائج المجموعة الاولى افضل من الثانية.

ان عظم الوجنة مجاور لانسجة ذات اهمية مظهرية ووظيفية لهذا فان اصلاح هذا الكسر يحتاج الى دقة كبيرة لتجنب حدوث مضاعفات وخيمة مثل نزف خلف كرة العين.

Abstract

Background: The treatment of condylar process fractures has generated a great deal of discussion and controversy in oral and maxillofacial trauma and there are many different methods to treat this injury.

Aim of study: To evaluate the methods of treatment of displaced condylar fractures, open or closed and pointing out their indications and contraindication.

Materials and methodes: Forty patients (20-50 years old) were selected with displaced sub condylar fractures unilateral or bilateral from January 2009 to September 2009. All patients were treated in maxillofacial unit, hospital of specialized surgery, in Medical City, Bagdad. This study protocol involves all the types of displacement of sub condylar region which can be diagnosed clinically and plain x-ray.

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By using all of above whether can evaluate the patients if need surgical or functional treatment (only mandibulo maxillary fixation).

Results: In our study we classified the displaced sub condylar fracture according to Row 1982 classification and we found the high percentage was medially displaced. We treated 12 patients from 40 patients surgically and 28 patients functionally and we found some of complications with the patients who were treated surgically as infection and visible scar, while the complications of displaced subcondylar fractures which are treated functionally are deviation during mouth opening, temporo mandibular joint pain, asymmetry of face and malocclusion.

Conclusion: With difficulties of follow up, for those patients with displaced sub condylar fractures which cannot be treated functionally (MMF) or still malocclusion evenly after using elastic band in MMF we preferred the open reduction with internal rigid fixation by extra oral approach.

Key Words:Displaced sub condylar fractures, surgical treatment, functional treatment.

Introduction

Mandibular fractures are extremely frequent in facial trauma. Condylar fractures are classified according to the anatomic location (intra capsular and extra capsular) and degree of dislocation of the articular head. [1, 2] intra capsular fractures are not often amenable to internal fixation and are usually managed conservatively.[3] extra capsular fractures are usually treated according to the severity of condylar displacement, the treatment must be chosen according to the presence of teeth, fracture height, patient's adaptation, patient's masticatory system, disturbance of occlusal function, internal derangement of temporomandibular joint (TMJ), condylar deformities, mandibular asymmetry, age, medical status of the patient, concomitant injuries.[4] The complications of condylar fractures include pain, restricted mandibular movement, muscle spasm and deviation of the mandible, malocclusion and pathological changes in the TMJ, osteonecrosis and asymmetry of face and ankylosis. [5, 6, 7]

Material and methods

This study was obtained by prospective study which consist of 40 patients, age ranged between (20-50 years old), with displaced sub condylar fractures, unilateral or bilateral for 9 months from January 2009 to September 2009. All patients were treated in the maxillofacial unit, hospital of specialized surgery, in Medical City, Bagdad. This study protocol involved all the types of displacement of sub condylar region which can be diagnosed clinically and with plain x-ray (we used posterior anterior view of the of the mandible and orthopantomogram), we determined by clinical examination the deviation of mandible, facial asymmetry, malocclusion, restricted mandibular movement, numbers of the teeth, association with other fractures in the face and general health status. By using all above we can evaluate if the patient need surgical treatment or functional treatment (only mandibulo maxillary fixation).

For those patients who needs open reductions our surgical approach with preauricular or submandibular incisions for application of internal rigid plates.

Results

We have 40 patients with displaced sub condylar fractures (unilateral and bilateral) as in table (1) and about 82.5% of the patients with unilateral and only 17.5% of them were with bilateral.

Table 1: Distribution of displaced sub condylar fractures according to one or both sides and the types of treatment (surgical and functional)

No. of Patient	Unilateral displaced sub condylar fractures	bilateral displaced sub condylar fractures	Surgical treatment	Functional treatment
40	33	7	12	28
Percentage	82.5%	17.5%	30%	70%

We found 50% of displaced sub condylar fractures were medially displaced and the less percentage is in anterior displacement and no case was recorded in intracranial displacement. As shown in table (2).

Table 2: Kinds of displacement of fractured sub condylar region.

Direction of displacement	No. of patent	percentage
Medial displacement	20	50%
Lateral displacement	9	22.5%
Anterior displacement	5	12.5%
Posterior displacement	6	15%
Superior displacement (intracranial)	0	0%
Total	40	100%

As in table (1) we treated 12 patients (30%) from 40 cases surgically and 28 patients (70%) was treated functionally (close treatment). Surgical access was obtained either with a pre auricular approach with or without retromandibular incision by making a cutaneous incision on the surface of the mandibular angle and over the masseter muscle between buccal and marginal mandibular rami of the facial nerve. This permit better control of the condylar neck region, although it can produce a more prominent scar.

Complications are listed in table (3), in one patient associated with associated infection we needed antibiotic therapy for 10 days with continuous irrigation with hydrogen peroxide and packing with iodoform gauze, and other two patients were complaining from visible scar from retromandibular approach.

Table 3: complications of displacement fracture condyle with surgical treatment.

complication	No. of patients	Percentage
Reoperation	0	---------
Plate fracture	0	----------
Infection	1	2.5%
Malocclusion	0	----------
Facial nerve injury	0	----------
Visible scar	2	5%

In table (4) complications of displaced subcondylar fracture with functional treatment, we found 10 patients from 28 were complaining from deviation of the mandible during mouth opening toward the fracture side and 10 patients were suffering from discomfort and pain in the fracture side, in addition 5 patients with asymmetry of the face specially in patients with medially displaced condyle and 3 patients are still in malocclusion evenly after removal of mandibulo maxillary fixation usually in bilateral fractures.

Table 4: Complication of displaced sub condylar fractures after functional treatment.

Complications	No. of patients	Percentage
Deviation during mouth opening	10	35.71
Articular pain	10	35.71
Asymmetry of face	5	17.85
Malocclusion	3	10.71
Total	28	100%

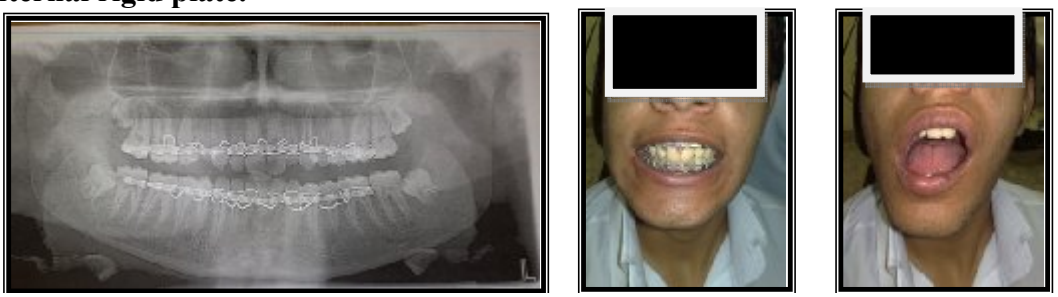
Discussion

Most of authors treat fractures that occur in childhood with non-surgical methods in order to exploit the capacity of the growing skeleton to be remodeled with normal functional stimulus. In our study we excluded the pediatric patients. The indications for the surgical or conservative treatment to displaced subcondylar fractures are in controversy [9, 10]. First of all a fracture classification must be designed to determine the exact indications for surgical treatment. We used as in table (2) Rowe 1982 classification, which evaluates the condyle according to its relation with the rest of the mandible. We found the high percentage of displacement is medially 50% then laterally 22% because the highly force of the lateral pterygoid muscle pull the head of condyle medially. [8] The treatment of displaced sub condylar fractures has generated a great deal of discussion and controversy in oral and maxillofacial trauma. Basic and very important requirements must be taken into consideration before the choice or option as made for type of treatment in adult patients, such as: height and quantity of the fracture traces; uni-or bilateral fractures; total temporomandibular joint on mandibular movements and the masticatory system; degree and direction of dislocation of the condyles; difficulty of surgical access; risk of lesion in critical anatomic structures; risk of hypertrophic and/or cheloid scar; patients general health status; presence of other maxillofacial fractures; possibility of performing physical therapy; neuromuscular adaptations.[11,12] In our study we made surgical treatment for 12 patients from 40 (table 1) most of them had medial and lateral displacement with sever malocclusion which had been failed treated by mandibulomaxillary fixation (MMF) and one of them associated with

comminuted zygomatic arch fracture therefore the patient need active mobilization to prevent ankylosis, and in other patients have no enough teeth for (MMF). For moderately displaced condylar fractures, functional treatment with rigid or elastic maxillomandibular fixation is still frequently selected. The reasons for this may be the difficult surgical access to the condylar area and the frequently difficult repositioning of the proximal fragments [13]. 28 patients from 40 patients as shown in table 1 were treated functionally by MMF, in most of them the occlusion was obtained in centric occlusion by MMF, or patients unfit for general anesthesia and postponing for several weeks, for that reasons we preferred to treat them functionally than surgically to prevent mal union.We found some of complications in patients with functional treatment (table 4) deviation during mouth opening toward the fracture site in 10 patients (35.71%), 10 patients (35.71%) had pain in the joint or muscle or both. 3 patients (10.7%) had mal occlusion and five patients (17.85%) had slightly asymmetry of face. The conclusion is that closed treatment of condylar fractures is non-traumatic, safe, and reliable and in only a few cases may cause disturbance of function. As in table (3) some of the complications reported as regards open treatment of displaced condylar fractures, during operation the difficulty of surgical access so we preferred using retro mandibular approach in addition to periauricular incision [14]. And difficulty in reduction of fracture in one alignmentsand fixated the plate specially if the level of fracture is high and the piece of condylar head is small. Infection was happened in one patient because he was a diabetic patient so after 2 weeks we removed the plate. The blood supply has been discussed a great deal, that the surgical access to the condylar process to perform open reduction and internal fixation requires exposure and dissection of some of the soft tissues of the condylar process to allow manipulation and attachment of fixation devices. Therefore, surgery further diminishes the blood supply to a segment of bone that has already been severely compromised. If it is important to maintain the blood supply to the condyle to prevent infection or a septic necrosis of the condylar segment, one should choose a surgical approach that can minimize the amount of soft tissue striping from the fractured condylar process and

retain attachment of the TMJ capsule and lateral pterygoid muscle as far as possible(15). Nevertheless, after reviewing the various articles published over the last few years, it is believed that with exception of absolute indication of closed treatment used in children, there are still no rules and/or defined for treating condylar fractures. The decision about the choice of the type of treatment must always take into consideration some of the factors, diagnostic precision and mainly the capability, experience and skill of the surgeons in this type of fractures.

Figure 1: laterally displaced sub condylar fracture treated by open reduction through preauricular and submandibular incisions, the fracture fixed by internal rigid plate.



A. **B.** **C.**

Figure 2: laterally displaced sub condylar fracture was treated functionally. Post operative complication as showing in figure c. deviation of the mandible during mouth opening.

Figure 3: medially displaced sub condylar fracture treated functionally with good occlusion.

Conclusion

With difficulties of follow up, for those patients with displaced sub condylar fractures which cannot be treated functionally (MMF) or still malocclusion evenly after using elastic band in MMF we preferred the open reduction with internal rigid fixation by extra oral approach.

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