

REDUCTION OF THE FRACTURE-LUXATION OF THE CONDYLE

A New Technique

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Summary

A technique for the reduction of the fracture luxation of the condyle is described and it could be added to theories already known. The condyle, captured from its postraumatic location, at the bottom of the base of the cranium, is reduced by means of a tunnel which begins at the mandible and extends to the space in the articular cavity.

Introduction

Another opencast technique to ease the reduction of the fracture-luxation of the condyle is described (Zide, 1989); thus, the surgeon is able to perform the precise fixing procedures required (Takenoshita, 1989; Raveh, 1989; Ellis, 1989), provided a temporary intermaxillary-mandible occlusion is restored.

It is widely known that the preauricular access is the classical approach; we are not going to point out how a careful dissection, as well as the hemostasis and a careful control of the facial nerve -at this level- has to be performed. It is very difficult to distinguish any referential point in the zone, as the condyle is not located where it should be (Bermejo, 1987).

Furthermore we are not going to write about the diagnosis of the fracture-luxation of the condyle, as the computerized tomography and the MR with transversal and coronal cuts are definitive in the preoperative as well as the postoperative period.

Perhaps our technique may achieve an easier replacement of the condyle (Kitayama, 1989), at least, that has happened in our case studies. The technical novelty (Nikkonen, 1989) lays merely in the replacement of the condyle in its place, inserting a first anchorage stitch of the miniplate or of the osteosynthesis wire, using as a means of replacement the submasseterian tunnel created at the mandibular angle.

Technique

The patient is placed under general anesthesia with pericranial fixation of the nasotracheal tube (Hernández Altemir, 1986). In complex craniofacial fractures, the submental intubation may be appropriate (Hernández Altemir, 1986).

Intermaxillary-mandible blockage with anchor splint is performed.

If there are fractures of the mandible arch, these should be abated prior to the condyle fracture treatment (Ikemura, 1985).

Later the occlusion has to be evaluated, but this is not always possible to achieve, because in some cases there are problems in reducing and fixing adequately the arch fractures. Even if this has been properly solved,

the same condyleous fractures can create a handicap for the appropriate occlusion. Although this does not often happen in a recent fracture-luxation of the condyle, with the patient under anesthesia.

The operatory field is prepared again in case the previous manœuvres have contaminated the area.

The incisions at preauricular and angulomandibular level are marked as shown in fig. 1. Usually surgery begins with a preauricular incision, dissecting the layers with thin hemostatic forceps, in order to identify the different structures, with a careful hemostasia. At the same time, the main branches of the facial nerve are exposed and left aside, bypassing them completely up to the periosty of the mandibular fractured fragment and detaching them from the rear; thus, avoiding the use of the cautery. This is a very complex manœuvre until we achieve the capsular structures be opened and checked in its deepest zone. Sometimes the condylar fragment is closely related to the maxillary branch, elopements of the condyle of 90°s or more may require such action.

Other times, the condyle is submerged at the bottom of the pterigomaxillary space, below the base of the cranium, near the carotid and the maxillar and internal jugular; this may be a risk when attempting to reduce the luxated condyle, as this, very often, is chipped or has very thin sides that can tear the great vessels if not carefully handled. So, it is recommended to look for the fractured fragment with an opencast technique, widening the space in the articular region, pulling from the mandibular angle as described here.

After finding the fractured and luxated condyle, an angulomandibullary incision is used to place a traction wire at the appropriate perforation, that will let us increase the space (Fig. 1, 2) where usually the fractured condyle can be easily found.

At the same time, the masseter muscle is detached from its insertions on the outer face of the body and mandibular angle and it is able to bypass subperiostically the mandibular fracture line corresponding to the fractured and luxated condyle. The rear traction helps in the search and extraction of the condyles, more or less at the bottom of the pterigomaxillary region. This extraction has to be done very carefully, detaching it from the remanent pericondyleal insertions, and above all, from the external pterigoid. Before extracting the condyle's head from the tissues where it is placed and kept, stitches are used in order to mark the site that will help us to make the traction and to relocate the fractured condyle, and it will cause the nearby tissues to be resituated in the best possible position.

The masseter detachment creates a tunnel that will correlate the surgical work made through the preauricular incision with the work performed at the level of the subangulomandibular incision. With the condyle in our hands, we will place the miniplate where it should be, according to the fracture pattern, and fixing it, but without any immobilization with a screw (Fig.2)

The last movement consists of piercing the mandibular condyle at the most suitable point and inserting into this a traction thread, whose function is to extract the condyle and the miniplate through the submasseter tunnel that has been created for this purpose. After having passed a hemostatic forceps, the condyle is placed into the articular space in such a way that eases the reduction. The outside traction is made by means of the same traction threads, to help them to reduce the soft pericondyleal parts. Both condylar traction threads are placed in a curved needle, and thus, the condyle is reduced and the pericondylean tissues are located in the adequate place as their position have also been modified due to the traumatical displacement of the fractured condyle (Fig. 3).

Sometimes it is necessary to sand the cutting or piercing edges of the condyleous fragment in the mandibular side. Sometimes even a miniplate can be inserted in the condyleous fragment. When the reduction and placement of the condyle is performed, the angulomandibular caudal traction is essential. When the fracture-luxation of the condyle is bilateral, prior to fixing the condyles -that is carried out with titanium miniplates-, it is necessary to perform an adequate intermaxillary occlusion that is fixed, mainly with elastic bands. After checking the reduction of the condyles and replacing the pericondyleous tissues in the best location, the fixing of the fractured fragments with titanium miniplates is carried out; as explained above. The window used to extract the condyles, marked with the reference stitches, as above explained, can be stitched with no anatomic purpose.

In certain cases we mark the pericondileous space with a Foley catheter,, that is introduced immediately after or during the extraction of the condyle from the pterigomaxillary region.

The operatory fields are stitched and the angulomandibular traction wire is detached.

Postoperative x-rays and above all, C.A.T., M.R. and orthopantography will help to evaluate the surgery performed.

The intermaxillary blockage is maintained for approximately 4 weeks; then opening and closing exercises are initiated very carefully; ocasionally active help may be required. This can be easily done with a pair of wooden pegs, a not very sophisticated but nonetheless useful device.

I would like to emphasize the importance of the pegs in regaining the temporomandibular function, as the best advantage they have is the fact that they are very cheap and useful.

Discussion

No other osteotomies are required with this technique, although they give good results, as proven by recent publications.

The combination of preauricular and subangulomandibular surgery helps to explore the fracture focus and to evaluate and ease the replacement of the pericondileous tissues, that were also displaced with the condileous fragment.

To avoid osteotomies and to protect the fractured condyle after fixing it in the best possible way, as shown in the technique description, perhaps may help to decrease the post reduction condyleous deformities and reabsortions, and the possible vascularization problems and fracture ossification, even if this would require a comparative study with other procedures.

The preauricular approach lets us mark the pericondyleous tissues, before extracting the fractured and luxated condyle from the pterigomaxillary space; this helps us to insert it inside them when the reduction occurs. A perfect anatomical reduction is not often sought, only one sufficient to re-establish the best articular function and to protect the shape and functions of the condyle; we also aim to achieve a better evolution of the condyle ossification and fracture focus.

Therefore, perhaps it is too early to be sure, but this procedure may produce a nearticulation that could be better than the ones obtained using other techniques.

The angulomandibular traction and condyle reduction by means of the submasseterin tunnel are manoeuvres that ease the condyle reduction, as well as the identification of structures or capsular spaces, as the submasseterin periosty leads us to the most caudal part of the articular space.

Conclusions

This is a technique that uses previous knowledge, and the main novelty is that it produces the replacement of the condyle, with the chosen osteosynthesis material, and periarticular tissues by means of a submasseterian tunnel in the best possible place. So, this procedure helps to achieve a better reduction and fixing of the condyle and soft articular parts.

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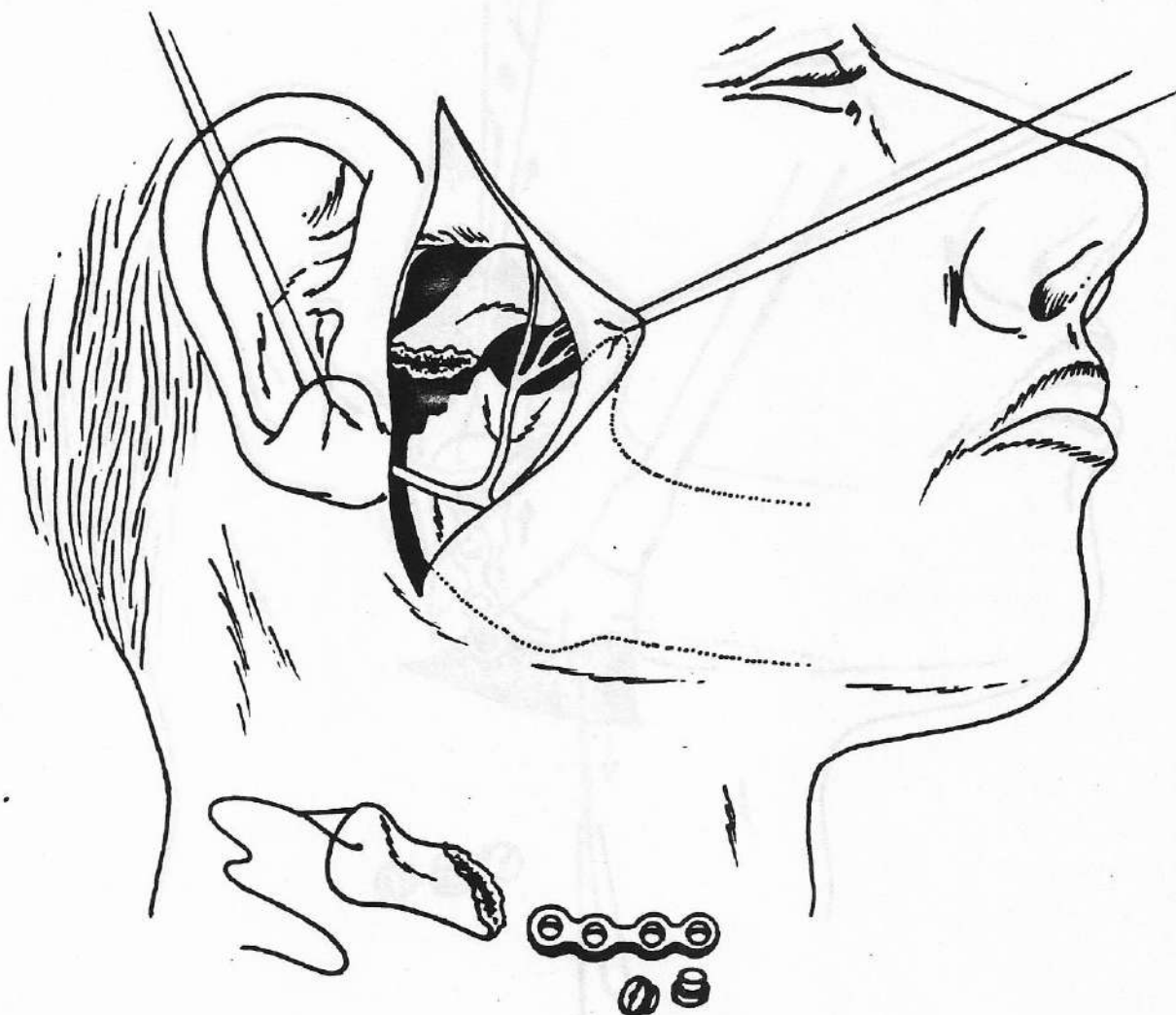


Fig.1

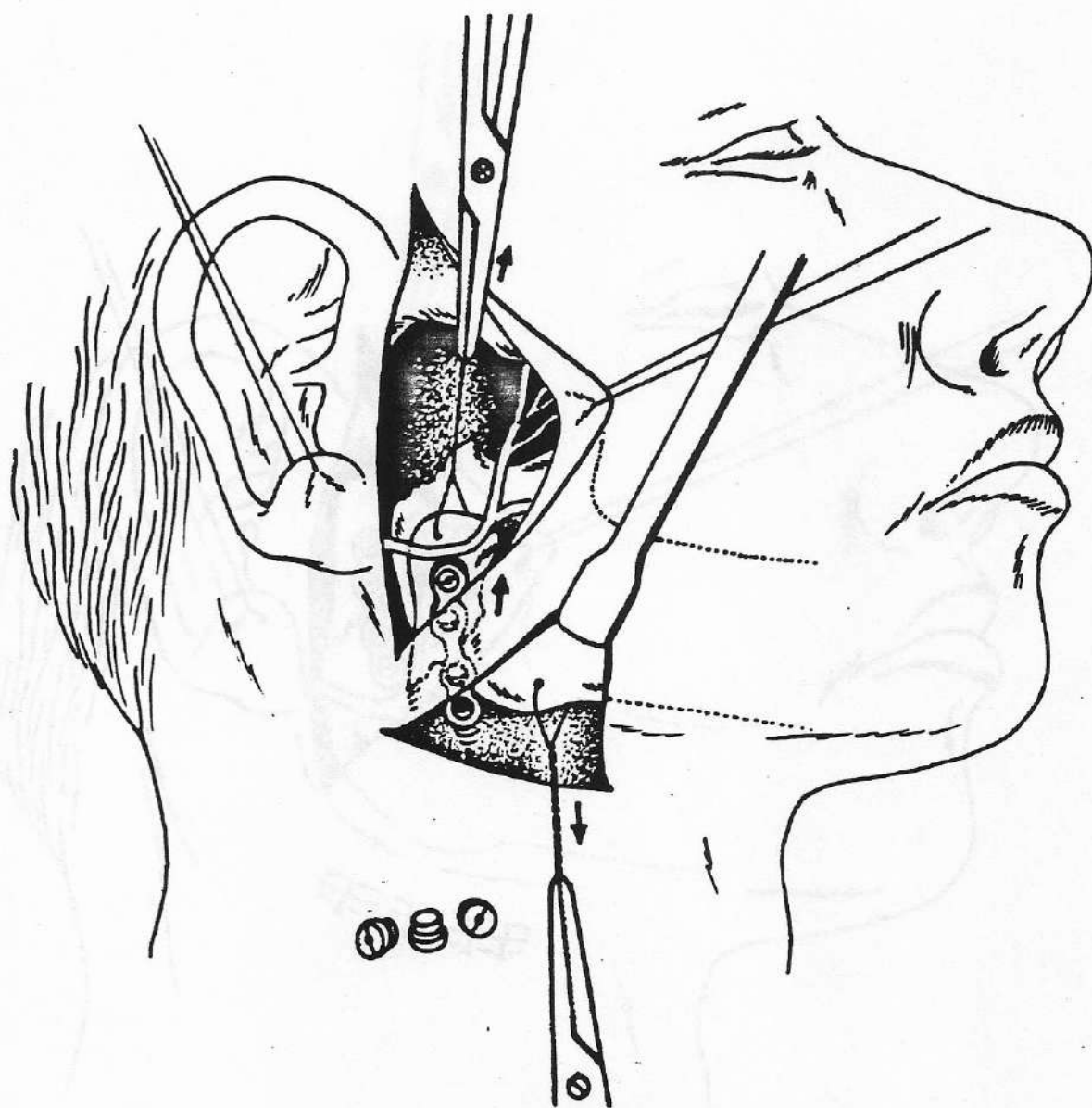


Fig.2

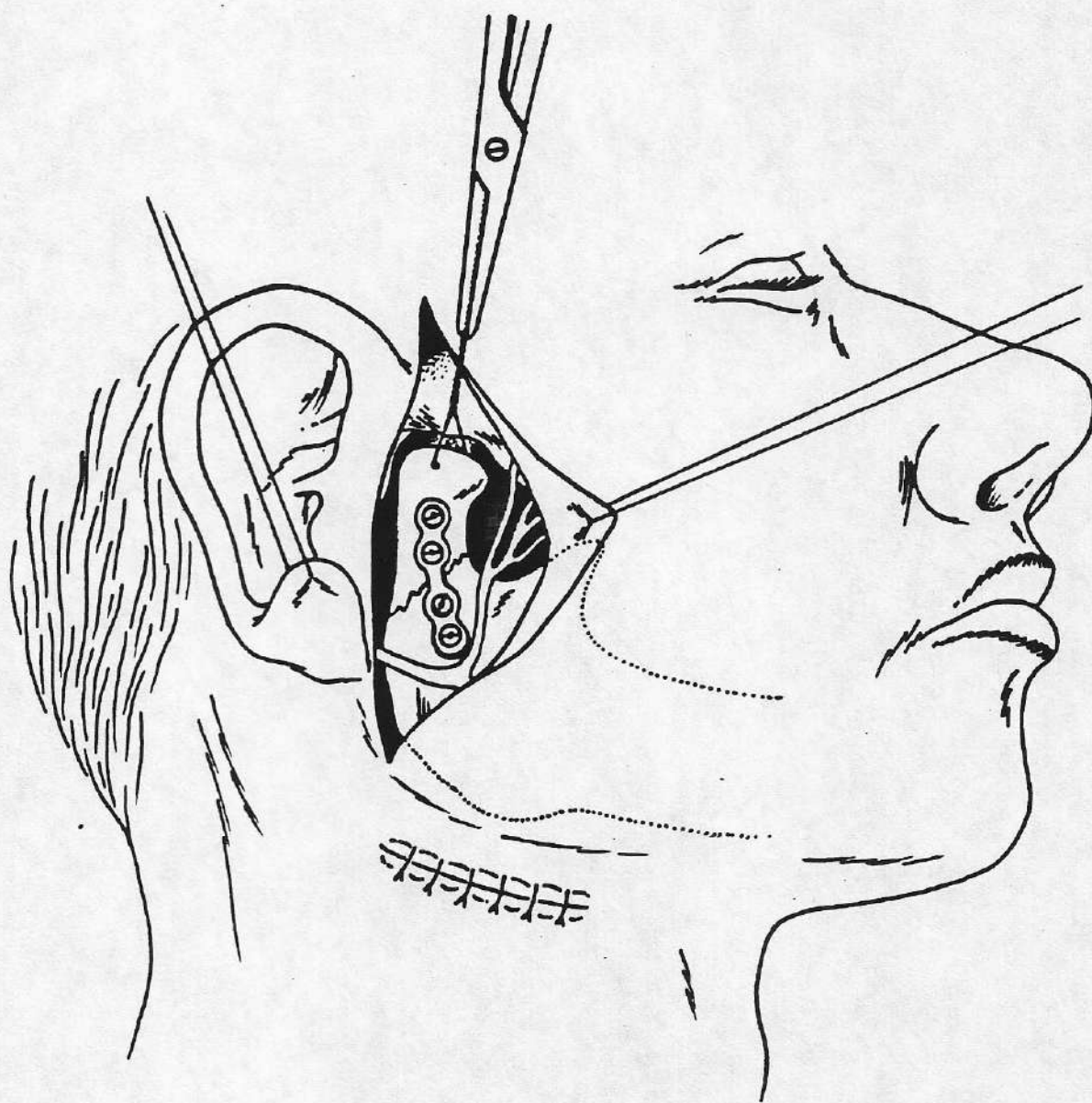


Fig.3