

# SURGICAL MANAGEMENT OF BIPOLAR CLAVICULAR DISLOCATION

A. J. ARENAS, T. PAMPLIEGA, J. IGLESIAS

**We present a case of bipolar dislocation of the right clavicle in a 26 year-old man. He was treated by open reduction plus internal fixation with Kirschner wires at the acromioclavicular joint, and orthopedic reduction of the sternoclavicular joint plus percutaneous osteosynthesis with Kirschner wires. An excellent (functional and cosmetic) result was obtained. A review of the literature is included, and some aspects of the treatment are discussed.**

**Keywords :** clavicle ; bipolar dislocation ; surgical treatment.

**Mots-clés :** clavicle ; luxation bipolaire ; traitement chirurgical.

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## INTRODUCTION

Bipolar dislocation of the clavicle is noteworthy by its rarity among traumatic lesions of the upper limbs (2, 3, 5, 6, 7). De Palma declares in his treatise of 1983 that he has not seen any cases of this lesion during his entire professional life (4).

This lesion has been given various names in the English literature : "Panclavicular dislocation" (6), "traumatic floating clavicle" (7), "bipolar clavicular dislocation" (3, 5). The lesion was described first by Porral in 1831, who named it "double luxation de la clavicle droite" (8). Beckman compiled 15 cases in 1924 and added one more case he treated himself (1). Since then, nearly 60 years passed before Gearen and Petty described another case in 1982 (6). In the last decade, Sanders *et al.* (10) have treated 6 cases, and some authors have published isolated cases (2, 3, 5, 7).

The purpose of this paper is to present another case of bipolar clavicular dislocation surgically

treated by means of a technique we have not found described until now.

## CASE REPORT

A 26 year-old male went to the emergency room because of trauma to the right shoulder. When playing soccer he fell down, hitting the external aspect of the shoulder on the ground. He complained of pain and powerlessness in the right upper limb.

Examination showed decreased shoulder mobility in all directions, intense tenderness on active and passive movement, and point tenderness in the clavicular region, especially at the ends of the bone. Swelling and a bump at the medial head of the clavicle was observed and it was dislocated superior and anterior to the sternum. Abnormal mobility of the clavicle was noted on palpation, showing why Jain named this lesion the "traumatic floating clavicle" (7). The patient had no significant previous medical history.

X rays showed incongruity of both clavicular articulations with lifting of the medial end of the clavicle and subacromial placement of the lateral one (fig. 1).

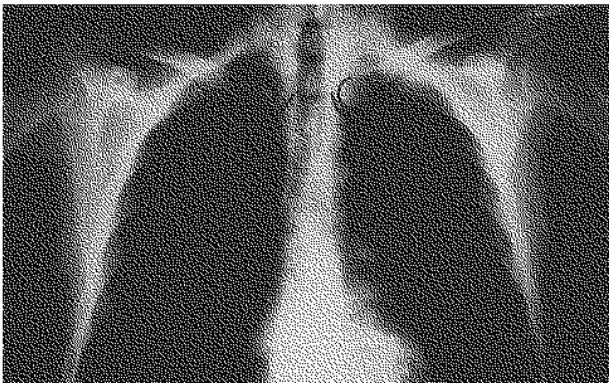
Given the absence of associated lesions we used an acromioclavicular approach under general anesthesia. The lateral end of the clavicle was

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seen in the subacromial area among the deltoid fibers, and the supraspinous muscle was interposed between the acromion and the clavicle. Gently withdrawing the smooth parts we reduced the joint manually and stabilized it by means of two Kirschner wires. After this, we obtained an orthopedic reduction of the sternoclavicular joint and stabilized it with two Kirschner wires placed under fluoroscopic control, with their subcutaneous ends twisted (fig. 2).



*Fig. 1.* — Dislocation of both clavicular poles on the right side. The increase in the articular spaces and the rotation of the clavicle in the horizontal plane can be seen.



*Fig. 2.* — Clavicle reduced after operation. The symmetry between the right and the left articular spaces can be observed. The ends of the Kirschner wires were bent to avoid migration.

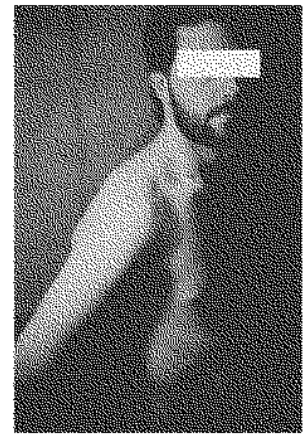
A Velpeau bandage was worn for 6 weeks, after which the sternoclavicular wires were removed. Active and passive rehabilitation of the shoulder was then begun, and 8 weeks after the operation,

the acromioclavicular wires were removed. (Both procedures were performed on an outpatient basis under local anesthesia). Twelve weeks after the first procedure, the patient was allowed to resume his usual work and sports.

At the last follow-up visit (30 months after the trauma), the clinical status was excellent, without functional restrictions. Neither an abnormal prominence nor unsightly scarring was present (fig. 3 and 4). A repeat x ray showed a symmetrically perfect anatomic relationship of both sternoclavicular joints (fig. 5).

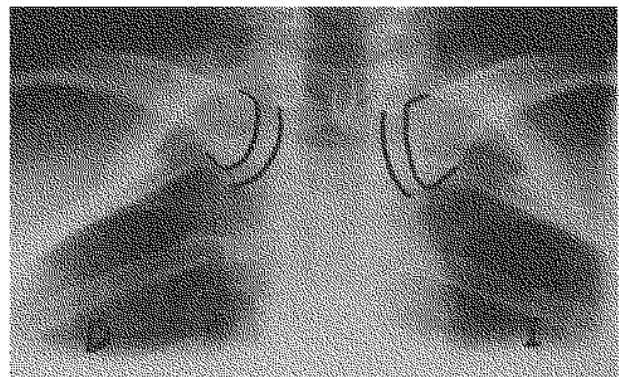


*Fig. 3*



*Fig. 4*

*Fig. 3 and 4.* — Functional result without restrictions. We cannot see any bump due to loss of reduction of the acromioclavicular or sternoclavicular joints.



*Fig. 5.* — X ray corresponding to the last visit, showing complete symmetry of both sternoclavicular joints.

## DISCUSSION

Bipolar dislocation of the clavicle is a very infrequent lesion, as is proved by the scarcity of clinical reports (2, 3, 5, 6, 7). Generally it is related to major trauma : traffic accidents, falls from great height, and so on (2, 3, 6), even though it can occur with lesser trauma (5, 7).

The mechanism appears to be different depending on the case. Some authors believe that the initial blow acts on the scapular spine determining an acromioclavicular dislocation first, and then, a sternoclavicular one (6, 7). Another theory maintains that the blow is anterior or lateral. The clavicle acts as a lever anchored in the coracoclavicular ligaments ; initially it is dislocated at the sternoclavicular level and afterwards, the force that continues acting in the same direction of those ligaments tears them and also the acromioclavicular ligaments (3, 5). Both hypotheses maintain that the dislocation of the two joints is consecutive (3, 5, 6, 7). In the opposite theory, Benabdallah considers that both dislocations are simultaneous (2). We think that our patient suffered a sternoclavicular dislocation first, and that because of the continued posterolateral application of force, with the coracoclavicular ligaments uninjured, these ligaments acted as a fulcrum for the clavicle, which was dislocated at the acromioclavicular level in a second place.

The usual injury is an anteroinferior dislocation in the sternoclavicular joint and a posterosuperior dislocation in the acromioclavicular one (1, 2, 7). Also seen is a clavicular displacement only in the horizontal plane (3, 10). Much more infrequent is an anterior and superior dislocation of the medial end of the clavicle with posterior and inferior dislocation of its lateral end (5, 6). Our case is very similar to that reported by these authors, with the special feature of insertion of a part of the deltoid and supraspinous muscles between the clavicle and acromion, a situation that we have not found described to date.

There is no agreement about the treatment of this lesion. Some authors prefer conservative treatments (3, 4, 6, 7, 9), but others advise surgical management (2, 5). Among the 16 cases presented

by Beckman, 15 were treated orthopedically but the one he managed was operated (1).

Several orthopedic solutions have been proposed : a) orthopedic reduction stabilized with a plaster cast for 4 weeks followed by a figure-of-eight harness for an additional 4 weeks (3, 6) ; b) orthopedic reduction and then support with a figure-of-eight harness until it is stable ; if dislocation recurs, a sling is used until the discomfort resolves (4, 9) ; c) there has even been a proposal of only a sling for a fortnight without even an attempt at orthopedic reduction (7). Jain believes that surgical treatment is difficult and not always accompanied by good results (7). Rockwood considers that the complications of surgical reduction of the sternoclavicular joint are too severe to make it advisable (9). Sanders proposes surgical treatment for the acromioclavicular joint in patients who continue to stress their shoulders (otherwise it may still be necessary to add surgical procedures to reduce pain and improve function), and he recommends conservative treatment for the sternoclavicular joint (10). Echo reduces, the acromioclavicular joint surgically, removes the disrupted meniscus, stabilizes with Kirschner wires and repairs the torn acromioclavicular ligaments ; in the sternoclavicular joint he performs an orthopedic reduction (5). Benabdallah does the same, joining a wire loop to the Kirschner pins (2). The latter advises surgical treatment for two reasons : 1) the accentuated secondary deflection which shows the acromioclavicular instability ; 2) the nearly total functional inability that arises from the lesion. However, he advises operation only when the shoulder cannot be orthopedically stabilized and there is some risk of reduced shoulder function (2).

We believe it is much too difficult to maintain well reduced acromioclavicular and sternoclavicular joints, with only orthopedic methods, especially if both are dislocated. Because of this, we prefer surgical reduction for the former and stabilization with Kirschner wires in both, which avoids relapses of the dislocation.

Whatever the treatment, the results have been good generally, for both the anatomic and the functional aspects (1, 3, 5, 6, 7, 9), but many of

the cases had a persistent bulge at the medial end of the clavicle because of incomplete sternoclavicular reduction (3, 5, 6), although this is probably less unsightly than the scar due to surgery.

We are in agreement with De Palma (4) and Echo (5) in offering surgical treatment to young patients and those with an active life. In our opinion, percutaneous osteosynthesis with fluoroscopic control (although not free of all risk), is a good procedure for management of sternoclavicular dislocation. Our patient achieved an excellent result, with neither articular nor strength deficits and a cosmetic appearance without anomalous bulges or ugly scars (figs. 3 and 4).

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### SAMENVATTING

*A. J. ARENAS, T. PAMPLIEGA, J. IGLESIAS. Chirurgische behandeling van bipolaire clavicular luxatie.*

De auteurs rapporteren een geval van bipolaire luxatie van de re-clavicula bij een 26-jarige man. Behandeling d.m.v. open repositie van het acromio-claviculair gewricht, gevolgd met osteosynthese met behulp van Kirschnerdraden en gesloten reductie van het sternoclaviculair gewricht, gestabiliseerd met percutane osteosynthese met Kirschnerdraden. Uitstekend functioneel en esthetisch resultaat. Overzicht van de literatuur en bespreking van de behandeling.

### RÉSUMÉ

*A. J. ARENAS, T. PAMPLIEGA, J. IGLESIAS. Traitement chirurgical d'une luxation bipolaire de la clavicle.*

Présentation d'un cas de luxation bipolaire de la clavicle droite traité chirurgicalement chez un homme de 26 ans. Le traitement consista en une réduction sanglante suivie d'ostéosynthèse avec broches de Kirschner pour l'articulation acromio-claviculaire et réduction orthopédique pour l'articulation sterno-claviculaire, également embrochée par Kirschner. Le résultat fut fort satisfaisant, autant au plan fonctionnel qu'esthétique. Revue de la littérature et discussion du traitement.