

ACUTE ANTERIOR FOREARM COMPARTMENT SYNDROME FOLLOWING WRIST ARTHRODESIS

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The authors report a case of anterior compartment syndrome in the forearm following total wrist arthrodesis via a dorsal approach. As far as they know this is the second case reported.

Keywords : compartment syndrome ; forearm.

Mots-clés : syndrome de loge ; avant-bras.

INTRODUCTION

Compartment syndrome is the clinical and pathological result of increased pressure within a limited space. This elevated pressure compromises the circulation and function of the tissues within that space. The most common causes are : fracture, soft tissue injury ("crush" syndrome), arterial injury (with hemorrhage in the compartment), drug overdose, external limb compression, burns and tight casts.

CASE REPORT

A 51-year-old woman with known seropositive rheumatoid arthritis was scheduled for a wrist arthrodesis (fig. 1a,b). Her basic treatment consisted of folic acid, methotrexate, hydroxychloroquine and piroxicam. Her general condition was good. Standard biochemical features were within normal limits. There was no indication of impaired hemostasis. Prothrombin time was 100%, and activated prothrombin time was 25 seconds.

The operation was performed under general anesthesia and tourniquet ischemia without exsanguination. Soft padding was wrapped around the upper arm. The cuff was inflated to a pressure

of 300 mmHg after 30 seconds of limb elevation. A modified Mannerfelt technique was used. A straight longitudinal dorsal incision was used and the cartilage of the radiocarpal and midcarpal joint was removed. The carpus was reduced on the distal radius. Two longitudinal K-wires were introduced, one through the shaft of the third metacarpal, and one between the second and third metacarpal. The distal end of the ulna was resected. The skin was closed with skin staples, without subcutaneous sutures. A soft well-padded dressing with fluffed gauze and cotton wool with an anterior plaster splint was applied.

The patient complained of progressively increasing pain during the first postoperative night. Despite elevation, opening of the dressing and local ice application, the pain became worse and intolerable in the morning. The fingers were held in flexion, and passive extension caused acute exacerbation of the pain. The radial pulse remained palpable and the fingers were warm and well vascularized. There was extremely marked swelling and tenderness of the anterior forearm.

Nineteen hours postoperatively she complained of paresthesias in the thumb which extended rapidly to the index and medius. Urgent decompression was performed (20 hours postoperatively) under general anesthesia. A fasciotomy according to Gelberman was performed without tourniquet.

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Fig. 1a.



Fig. 1b.

Through a palmar incision in the valley between the thenar and hypothenar eminences the carpal tunnel was released. The incision was then curved transversely across the flexion crease of the wrist and a volar forearm fasciotomy was performed through a zig-zag incision. When the anterior forearm fascia was opened the muscle bellies bulged out of the incision. They appeared healthy and mechanical stimulation provoked contraction. No massive hematoma was found.

The result was dramatic with immediate disappearance of the pain, but some numbness of the tip of the thumb persisted. Two weeks postoperatively the fasciotomy incision was progressively closed with Skin Extenders® (Dow Corning). At that time the patient had a full range of active motion of all fingers. X rays of the wrist and forearm demonstrated the wrist arthrodesis and correct placement of the K-wires (fig. 2).

DISCUSSION

The etiology of the anterior forearm compartment syndrome in this case of wrist arthrodesis remains obscure. A dorsal approach with extensive decompression of the extensor compartment had been performed and left open. As far as we know the anterior capsule of the radiocarpal, midcarpal and distal radioulnar joints was not perforated during the procedure. A severe anterior displacement of the carpus preoperatively was obvious, but had been easily reduced.

The patient had no bleeding disorders and during the fasciotomy, no hematoma was found. What appeared to us to be the most obvious cause was the very tight skin which appeared to act as a tourniquet, mainly owing to the swelling of the dorsal compartment.

The rapid progression of the clinical picture



Fig. 2.

over the last two hours was dramatic and precluded further investigations. Intracompartmental pressure measurement was not available at that moment. The differential diagnosis with acute carpal tunnel syndrome is not obvious. However, there were some clinical elements in favor of an anterior compartment syndrome: tenderness and swelling of the forearm muscles, rapid progression of the symptoms, paresthesias in all fingertips, including the fifth, absence of the Tinel sign over the median nerve at the carpal tunnel. As far as we know, only one case of flexor compartment syndrome following a dorsal wrist procedure has been reported (2). That case also had involvement of the extensor compartment and of the hand.

Acute compartment syndrome after a hematoma anesthetic block was reported by Younge in

1989 (5). Occasionally, distal forearm fractures have been associated with compartment syndromes (3, 4); a fracture of the body of the hamate bone has also been reported with compartment syndrome (1).

LITERATURE

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SAMENVATTING

BAETEN Y., DE SMET L., FABRY G. Acut compartment syndroom van de anterieure onderarm na radiocarpale arthrodesse.

De auteurs stellen een anterieur loge syndroom voor na totale pois arthrodesse via een dorsale toegangsweg. Ze vonden slechts één gelijkaardig geval terug in de literatuur.

RÉSUMÉ

BAETEN Y., DE SMET L., FABRY G. Syndrome de loge aigu au niveau de la loge antérieure de l'avant-bras après arthrodesse radio-carpienne par voie dorsale.

Les auteurs présentent le cas d'un syndrome de la loge antérieure de l'avant-bras après une arthrodesse du poignet réalisée par voie dorsale. Ils n'ont retrouvé qu'un cas similaire dans la littérature.