



Case report

Brachial artery injury due to closed posterior elbow dislocation: case report[☆]



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ABSTRACT

An association between closed posterior elbow dislocation and traumatic brachial artery injury is rare. Absence of radial pulse on palpation is an important warning sign and arteriography is the gold-standard diagnostic test. Early diagnosis is essential for appropriate treatment to be provided. This consists of joint reduction and immobilization, along with urgent surgical restoration of arterial flow. Here, a case (novel to the Brazilian literature) of an association between these injuries (and the treatment implemented) in a 27-year-old male patient is reported. These injuries were sustained through physical assault.

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Lesão da artéria braquial decorrente de luxação posterior fechada do cotovelo: relato de caso

RESUMO

A associação da luxação posterior fechada do cotovelo com a lesão traumática da artéria braquial é rara. A ausência do pulso radial à palpação é um importante sinal de alerta e a arteriografia é o exame diagnóstico padrão-ouro. O diagnóstico precoce é essencial para a providência do tratamento adequado, que envolve a redução e a imobilização articular, além do restabelecimento cirúrgico urgente do fluxo arterial. É relatado um caso inédito na literatura brasileira da associação dessas lesões (e do tratamento feito), ocorrida em um paciente de 27 anos, do sexo masculino, após ter sido vítima de agressão física.

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Introduction

Traumatic dislocation of the elbow is a common orthopedic injury, and this accounts for around 20% of all joint dislocations.¹ Injuries to arteries occur in 5–13% of all elbow dislocations, especially in cases of exposed dislocation or penetrating trauma.² On the other hand, closed dislocations are only rarely associated with vascular injuries.¹

A clinical diagnosis of brachial artery injury associated with closed dislocation of the elbow not only is an infrequently observed combination, but also may be difficult to diagnose, even if there is a high degree of suspicion.^{3,4} Nonetheless, making this diagnosis early on is essential in order to provide the appropriate treatment, given that delayed diagnosis is the main factor for worsening of the prognosis.⁵

Starting in 1913, only a few cases of this association have been described. A survey of the literature conducted in 2009 showed that only 40 cases had been reported in the literature in English and French.⁴ In Portuguese, we did not find a single case. In the following, we report the case of a patient who was treated at our service with this condition.

Case report

A 27-year-old man who had been the victim of physical aggression less than two hours earlier was brought to our emergency service. Upon physical examination, in addition to increased volume of the left elbow and intense pain on mobilization, the ipsilateral hand presented slightly decreased temperature, the peripheral capillary perfusion was slightly slower than normal and, on palpation of the pulses, the ulnar pulse was diminished and the radial, absent. The neurological examination on the limb was normal and, except for small scratches, the skin was intact.

A diagnosis of posterior dislocation of the elbow was made (Fig. 1), and the joint was promptly reduced in a closed manner. However, the vascular clinical condition continued unaltered.

After assessment by the vascular surgery team, angiotomography of the limb was performed. This showed complete occlusion of the brachial artery (Fig. 2).

Through emergency exploratory surgery, stretching of the brachial artery (which had progressed with consequent thrombosis) was diagnosed, located around 3 cm proximally to its bifurcation into the radial and ulnar arteries (Fig. 3). This condition was treated by means of resection of the lesion and construction of a brachio-brachial anastomosis using an inverted graft from the saphenous vein, harvested from the ipsilateral lower limb (Fig. 4). Fasciotomy of the volar compartment of the forearm was performed because of its severe edema. Transarticular external fixation of the elbow was also performed (Fig. 5).

The patient evolved well from a vascular point of view. The radial and ulnar pulses returned before the end of the operation, along with normalization of the peripheral capillary perfusion rate, color and temperature of the extremity. These signs of patency of the arterial flow were maintained until after the definitive removal of the external fixator (six weeks after the first operation), which confirmed the success



Fig. 1 – Lateral radiograph of the left elbow, showing posterior dislocation and soft-tissue edema.

of the anastomosis. The cutaneous borders of the fasciotomy were brought together again and successfully sutured one week after the vascular surgery.

It needs to be noted that because of socioeconomic issues, the patient failed to return for outpatient follow-up after the external fixator had been removed. Therefore, we are unable to report on the patient's complete evolution, especially with regard to elbow function.

Discussion

Although the elbow is the second⁶ or the third^{1,2,5} most commonly dislocated joint in the human body, the literature consists of only a few limited case reports on vascular lesions resulting from this injury.⁴ Therefore, the frequency of occurrence of this association is difficult to estimate.^{2,4} However, it is now known that the majority of the cases of injuries to arteries, especially the brachial artery, occur in cases of exposed dislocation.¹⁻³ However, in this study, we will only discuss occurrences of this injury in cases of closed dislocation, as occurred in the present case report.

The literature shows that the site of brachial artery injury is typically in its more distal portion, just a few centimeters above its bifurcation into the radial and ulnar arteries,³⁻⁵ as was found in our case (Fig. 3). The lesion site can be explained by the anatomy: in cases of posterior dislocation of the elbow, the distal portion of the brachial artery may become compressed between the rigid aponeurosis of the biceps and the dislocated bone structures, particularly the distal epiphysis of the humerus.³⁻⁵

The interruption of the arterial flow may be clinically just as evident as the dislocation that produced it, with absence of the radial and ulnar pulses and a pallid hand. However, the clinical condition may be more baffling and the

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