



## Case report

# Axillary artery lesion secondary to fracturing of the proximal third of the humerus: case report<sup>☆</sup>



Alberto Naoki Miyazaki, Marcelo Fregoneze, Pedro Doneux dos Santos, Luciana Andrade da Silva\*, Guilherme do Val Sella, Sergio Luiz Checchia, Sílvia Helena Cavadinha Cândido dos Santos, Fábio Araujo Fernandes

Department of Orthopedics and Traumatology, School of Medical Sciences, Santa Casa de São Paulo, São Paulo, SP, Brazil

## ARTICLE INFO

### Article history:

Received 30 December 2013

Accepted 6 February 2014

Available online 22 January 2015

### Keywords:

Axillary artery  
Humeral fractures  
Shoulder fractures

### Palavras-chave:

Artéria axilar  
Fraturas do úmero  
Fraturas do ombro

## ABSTRACT

Lesions of the axillary artery are rare in patients with fracturing of the proximal third of the humerus and may have greatly varying clinical manifestations. They are responsible for 15% and 20% of upper-limb artery injuries and the commonest mechanism is a fall to the ground, which accounts for 79% of such injuries. In some cases, the signs only appear later on. It is important to bear this association in mind, so as to make an early diagnosis and avoid serious complications. We report on a case of traumatic injury of the axillary artery secondary to fracturing of the proximal third of the humerus in an 84-year-old patient, with late evolution of clinical signs of ischemia in the limb affected. The aim here was to discuss the diagnostic difficulties and treatment.

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## Lesão da artéria axilar secundária a fratura do terço proximal de úmero: relato de caso

## RESUMO

As lesões da artéria axilar são raras em pacientes com fraturas do terço proximal do úmero e podem ter manifestações clínicas bastante variadas. São responsáveis por 15% a 20% das lesões arteriais dos membros superiores e o mecanismo mais comum é a queda ao solo, que representa 79% dos traumas. Em alguns casos os sinais só aparecem tardiamente. É importante lembrar essa associação, a fim de diagnosticá-la precocemente e evitar complicações graves. Relatamos um caso de lesão traumática da artéria axilar secundária à fratura do terço proximal do úmero em uma paciente de 84 anos, com evolução tardia dos sinais

<sup>☆</sup> Work developed in the Shoulder and Elbow Group of the Department of Orthopedics and Traumatology, School of Medical Sciences, Santa Casa de São Paulo, Fernandinho Simonsen Wing, São Paulo, SP, Brazil.

\* Corresponding author.

E-mail: [lucalu@terra.com.br](mailto:lucalu@terra.com.br) (L.A. da Silva).

<http://dx.doi.org/10.1016/j.rboe.2015.01.002>

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clínicos de isquemia do membro acometido. O objetivo é discutir as dificuldades do diagnóstico e do tratamento.

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## Introduction

Injuries to the brachial plexus and axillary artery are rare in patients with fractures of the proximal third of the humerus (FPTH), despite the anatomical proximity of these structures.<sup>1</sup>

Injuries to the axillary artery are responsible for 15–20% of the arterial injuries of the upper limbs<sup>2</sup>; 94% of them are caused by penetrating wounds and the remainder (6%) are due to dislocated fractures of the shoulder. The most common mechanism for the latter is falling to the ground, which accounts for 79% of such injuries.<sup>3</sup>

The aim of this article was to report on a case of injury to the axillary artery that occurred as a consequence of FPTH, along with the difficulties in making the diagnosis and performing the treatment.

## Clinical case

The patient was an 84-year-old woman who was admitted to the emergency service after having suffered a fall to the ground, with right-side FPTH and cranial injury.

On physical examination, edema, hematoma and pain when moving the right shoulder were observed. Neurological examination of the right upper limb showed paresis in the hand and elbow, but this examination was impaired because of the lowered consciousness level associated with the cranial injury. On vascular examination, palpation of the distal pulse and measurement of peripheral perfusion were normal. A radiograph on the right shoulder showed a FPTH with marked medialization of the metaphysis (Fig. 1). Surgical treatment was proposed, but because of the cranial injury and comorbidities, it was not possible to operate on the patient as an emergency.

On the third day of the hospital stay, it was observed that the temperature of the right upper limb had decreased, the distal perfusion had diminished and there was no distal pulse. Emergency surgical exploration was indicated, with the suspicion of thrombosis of the axillary artery. There was no need for preoperative arteriography, since the clinical condition of ischemia was self-evident and this supplementary examination would have postponed the operation and added greater damage to the limb.

By means of the deltopectoral route, arthroplasty was performed in order to resect the humeral epiphysis, because of the severity of the situation and the patient's poor clinical condition. The vascular surgery team performed dissection of the axillary artery and found that it was intact, but with pulse present in the region proximal to the fracture and absent distally. Thromboendarterectomy was performed (Fig. 2) using a Fogarty® catheter in order to completely remove the obstruction of the arterial lumen. Intraoperative arteriography (Fig. 3)

showed another obstruction at the level of the elbow, which was also dealt with in order to achieve limb reperfusion.

In exploring the brachial plexus, we only observed signs of contusion of the median, ulnar and musculocutaneous nerves.

The patient died after the operation, 10 h after she was taken to an intensive care unit, where she had arrived intubated and presenting hemodynamic instability. Her condition progressed to bradycardia, followed by asystole, which could not be reversed. The cause of death was identified as pulmonary thromboembolism.

## Discussion

Traumatic injury to the axillary artery, as a complication of FPTH, is rare. Yagubtan and Panneton<sup>3</sup> only found 24 cases of injury to the axillary artery subsequent to FPTH described in the English-language literature. A neurological deficit was observed in 46% of the patients and 54% had injuries of the intima layer of the artery, which led secondarily to thrombosis. Vascular repair was performed in all the cases, with an upper-limb salvage rate of more than 89%.



**Fig. 1 – Radiographic image of the right shoulder in anteroposterior view showing fracture of the proximal third of the humerus: note medial displacement of the humeral metaphysis.**

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