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A case of brachial plexus avulsion

Nathan Ratsimarisolo[1], Narindra Lova Hasina Rajaonarison Ny Ony[2], Kanto Razafindraibe[3], Nicolas Fanantenana Herinirina[4], Fanomezantsoa Andriampararny Rakoto[5], Ahmad Ahmad[6]

[1] Radiology departement, Hospital Center Soavinandriana Antananarivo, Madagascar
[2, 3] Medical Imaging Center, Hospitalo-univeristy Center Joseph Ravoahangy Andrianavalona, Antananarivo, Madagascar
[4] Medical Imaging Center, Hospitalo-univeristy Center Tanambao, Antsiranana, Madagascar
[5] Oto-rhino-laryngology departement, Hospital Center Soavinandriana Antananarivo, Madagascar
[6] Medical Imaging Center, Hospitalo-univeristy Center Joseph Ravoahangy Andrianavalona, Antananarivo, Madagascar

Abstract
Brachial plexus avulsion is rare a pathology and difficult to diagnose. We report a case of a young man with staggered fractures of the lower limbs to describe the radiological aspects of this condition.
The radiography and CT-scan of our young patient did not demonstrated any osteoarticular lesions of the left upper limb. Whereas the MRI of the brachial plexus showed an avulsion of the brachial plexus. Femoral fractures left and right tibial testify the violence of the accident on the public road and the origin of the death of the patient by a pulmonary embolism.
This case has allowed us to show that complete avulsion of the brachial plexus is possible despite the absence of fractures in the upper limbs.

Keywords: avulsion, brachial plexus, MRI

Introduction
Brachial plexus avulsion is a rare pathology [1]. It is grievous and difficult to diagnose. We report a case of a young man with staggered fractures of the lower limbs to describe the radiological aspects of this condition.

2. Observation
A 27-year-old male victim of a highway accident complained of a severe pain in the type of burns to the left upper limb and functional impotence in both lower limbs. The radiography and Computed Tomography (CT) scan did not demonstrated any osteoarticular lesions of the left upper limb (Fig. 1). However, the left femoral diaphysis had a complex spiroid fracture with several bone fragments (Fig. 2), as well as the right tibia (Fig. 3). Faced with the persistence of pain in the left upper limb without osteo-articular involvement, and one week after the surgical management of lower limb fractures, an MRI of the left brachial plexus was performed which showed an infra-centimetric collection of major axis, in hypersignal T2, in hyposignal T1 of root insertion C6, C7, C8 and D1 on the left. These roots had a tortuosity and thickening and retracted into sub-clavicular and axillary (Fig. 4). The patient died from pulmonary embolism after three weeks of surgical treatment of lower limb fractures.

3. Discussion
Brachial plexus avulsion is the desertion of a number of roots anterior or posterior from a sudden traction on the nerve trunks (2). Narakas recovered 1068 patients with brachial plexus lesions for 18-years [3]. Brachial plexus injury is the most serious form of neurological damage to the upper limb which leads to functional impairment and physical disability with severe pain [4]. Brachial plexus lesions can be caused by a wide variety of mechanisms including falls, traumatic traction, crushing, penetrating lesions, obstetrical complications, thoracic parade syndrome, tumors and aneurysms of the underlying vascular system [4]. These lesions often occur in a polytraumatic context such as this case here, and, as a result, their diagnosis and treatment are often delayed.
A study by Goldie and Coates (1992) suggests that there are 350 cases of supraclavicular traction injuries and 150 serious infraclavicular injuries per year in Britain [5]. Supraclavicular involvement like our patient's often affects patients under 40 years of age. according to Narakas [3]. The absence of bone damage on the x-rays of the left cervical spine, shoulder and upper limb may be related to traumatic traction during the highway accident, while the fractures of the lower limbs reflect the severity of the trauma. In addition, traction trauma is the most common mechanism of brachial plexus injury [6].
Persistence of pain and functional impotence should be indicated by the cervical vertebra-medullary MRI and brachial plexus to reveal severe neurological damage. The MRI is a better alternative than myeloscanning, which is invasive and does not provide information on the condition of the bone marrow [7]. It shows a lack of root continuity, retraction or thickening of the root tips, and meningocele due to dural injury [7]. The brachial plexus lesion found in our case is located in zone, according to

the modified Nagano classification, corresponding to the avulsion of the roots on the bone marrow [8]. Narakas [3] and his team found an associated vascular lesions in 23% and other associated lesions in 80% while our patient had no other lesions on the upper limbs.

In post-operative care, plexus lesions can work well if the operation is performed early. Otherwise, surgery should only be performed to relieve severe pain. Nerve surgery should ideally be performed within six months to achieve the best possible recovery results. Furthermore, muscular atrophy, the progressive disappearance of motor plaques, and the secondary retrograde apoptosis of neurons located in the dorsal ganglion make a good nervous recovery illusory after 18 months [9].

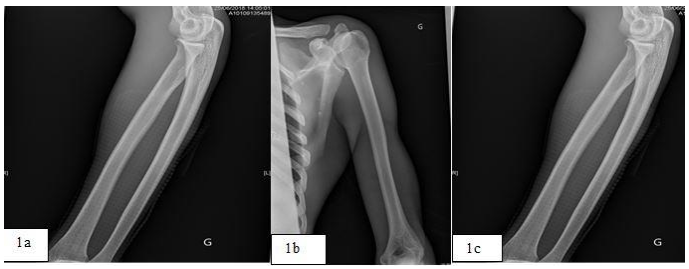

Fig 1: X-ray of the left shoulder (1a), left arm (1b), and left forearm (1c) showing no osteoarticular injury

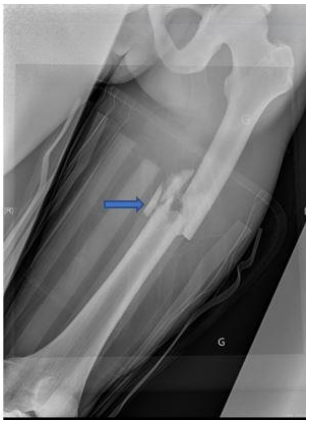

Fig 2: X-ray of the left femur showing a complex fracture of the femoral diaphysis (arrows)

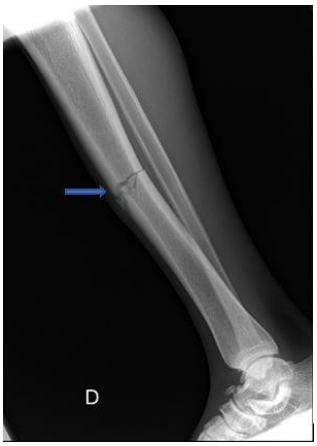

Fig 3: Radiographic view of right leg showing tibia fracture (arrows)

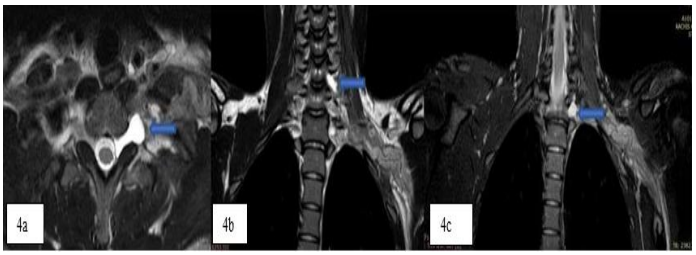

Fig 4: T2-weighted brachial plexus MRI in axial section(4a), T2 coronal (4b) and STIR (4c) showing left root C7 avulsion (arrows) with thickening and tortuosity as well as sub-shrinkage clavicular and axillary root and fluid collection at insertion

4. Conclusion

The avulsion of the brachial plexus is a rare pathology that should not be ignored in front of neurological signs of the upper limbs in a traumatic context, even without osteo-articular involvement. An MRI and a myeloscanning are the radiological examinations used to diagnose and characterize the avulsion of the brachial plexus. This case has allowed us to show that complete avulsion of the brachial plexus is possible despite the absence of fractures in the upper limbs

5. References

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