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Letter to the editor

The study of causal link in a rare case of workplace injury

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To the Editor,

In the legal medicine the causal link is not satisfied if the accident occurs during work or in the workplace, but other criteria must be satisfied such as the suitability (qualitative/quantitative) of the event. We recently had a case of scapular fracture from electrocution. Scapular fracture after electrocution without direct trauma associated (high voltage electrical injury) is rare indeed because the usual orthopedic lesion of the upper limb from accidental electric shock is a posterior fracture-dislocation of the proximal humerus, and no the scapular fracture. This happens due to the strong concentration of muscles around the shoulder that forces the humeral head superiorly and posteriorly against the acromion and medially against the glenoid before it slips behind the glenoid rim into posterior dislocation (1). The presence of a scapular fracture in the absence of a trauma in the clinical history poses difficulties in recognizing the causal link and it requires necessarily a research and study of scientific literature to understand that the scapular fracture could only be due to electrocution. This commitment is required above all in a medical legal and insurance context in which a financial compensation is possibly provided for the injured person. We had an episode happened on the workplace of a displaced and comminuted fracture of a right-handed man's left scapula. The case involved a man, 37 years old, worker in a bottling factory. He reports that while working (a phase of work) in the instant when he placed his left hand on a machine (cap elevator) and his right hand on another machine (uniblock where all the bottling process happens) he felt as if he was immobilized and paralyzed as a result of a violent muscular contraction. He managed to free himself from this feeling only after a few seconds and he is not able to quantify by removing his left hand from the car. He denies having fainted or traumas on the shoulder or the back. After a few minutes a violent contraction of his left shoulder forced him to get to the hospital. After the x-rays and computed tomography, they the diagnosys of displaced and comminuted fracture of the left scapula (Figure 1).

The therapeutic treatment was conservative and the absence from work consisted of 64 days of initial functional rest with a pharmacological therapy and subsequent physiotherapy. He hypothesizes that the cause is linked to the movement of the mobile machine (cap elevator) which is usually moved for cleaning with consequent exposure of one of the 5 cables (more precisely one of the 3 phases of 220 Volts each, then a neutral and one complete the socket grounding). Following an episode of electrocution, secondary trauma to the limbs, trunk or head may occur due to an impact on the ground or with structures (for example a wall or other) located in the immediate vicinity of the worker. In this case, however, the worker denied the presence of secondary trauma and what was reported was considered convincing because the medical documentation presented did not show an episode of alteration of consciousness and no blunt injuries to the body were found. So the rigorous method forced us to verify the dynamics reported with scientific evidence and the literature search was directed towards a "scapular

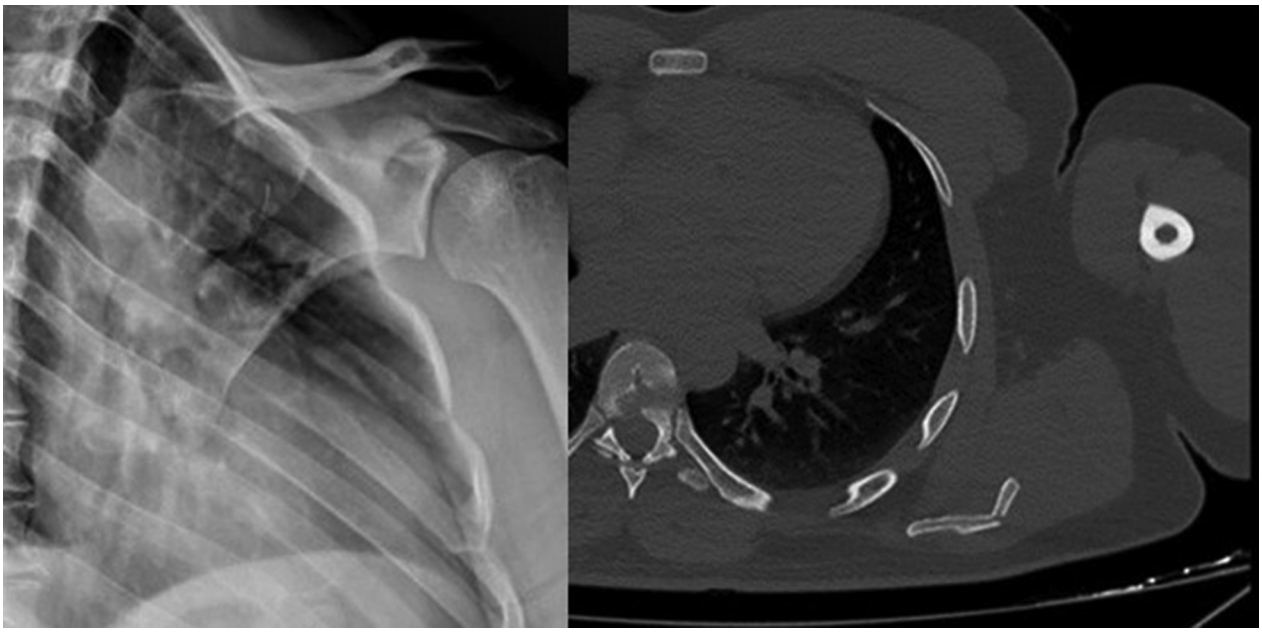

Figure 1. Left shoulder RX with an irregular rhyme of radiotransparency at the body level and the Left shoulder CT with displaced multifragmentary fracture of the body of the left scapula extending close to the inferior angle.

fracture" from "electrocution". Cases are described after no-work accident. Our is a case of accident at work and cases of this type described in the literature only involved an engineer while testing a washing machine (2) and a bricklayer working on a concrete mixer (3). In one case, a 40-year-old policeman was voluntarily hit with a taser in the left shoulder following an on-the-job training exercise but was already lying on the ground (4). In our case the worker believes it is attributable to exposure to 220 Volts while in the literature the cases were usually associated with a low frequency and voltage between 240 and 440 Volts (2), but 110 Volts was the lowest voltage described that induced the fracture scapular (3). In our case the worker reported no particular sensations except for a sensation of immobilization and paralysis from muscle contraction which made it difficult to detach himself from the vehicle. The sensation reported in the literature is that of the current rising up one arm, crossing the shoulders and descending along the other arm. After a few seconds you manage to free yourself without falling or losing consciousness (2, 3). In one case the pain complained of was limited to the ipsilateral arm and shoulder and the upper part of the back (5). The skin can be intact (1, 3) as in our case. The hypothesis put forward is that the electrical stimulation caused a tetanic and uncontrollable muscle contraction, in particular of the Latissimus dorsi and the upper portion of the Trapezius in opposite directions. This created forces large enough to fracture the scapula (6). Only in some cases the outcomes can also be comminuted fractures (1, 3) as in our case. The authors found themselves in difficulty in studying the causal link and in recognizing the insurance protection of this rare accident event. The study of the casual link in the case of rare and complex dynamic lesions cannot ignore the research of the scientific literature which has made it possible the recognize the lesion compatibile with the dynamics and to point out the usefulness of this case series from a clinical and therapeutic, but also insurance.

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