CASE REPORTS

How Complicated a Complicated Case Can Become?

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Abstract

Work-related accidents have a great spread worldwide. The incidence of crush syndrome is 2-15% in all trauma patients and in many cases may lead to trauma related amputation. This type of patients are at risk of developing cardio-vascular instability, renal failure, other organ failure and metabolic abnormalities. The treatment is complex and should prevent and treat all the complications. In the present paper we reported a case of work related injury which lead to the above-knee amputation, followed by severe complication and difficult social rehabilitation. In this particularly cases, when you think that the fight is almost over, a new organ failure may occur and threaten the life of the patient.

Keywords: work-related accidents, lower limb, crush syndrome, trauma-related amputation, organ failure

Rezumat

Accidentele de muncă au o mare incidență. Sindromul de strivire se întâlnește la aproximativ 2-15% dintre pacienții care au suferit o traumă și poate determina amputația membrului implicat. Acești pacienți au riscul de a dezvolta instabilitate cardio-circulatorie, insuficiență renală, precum și alte disfuncții organice și anomalii metabolice. Tratamentul este complex și trebuie să prevină și să trateze toate complicațiile posibile. În această lucrare prezentăm un caz de accident de muncă care a dus la amputația treimii distale a coapsei și a dus la o serie de complicații severe și reabilitare socială dificilă. În aceste cazuri grave, când crezi că totul s-a soluționat, apare o nouă insuficiență organică amenințătoare de viață.

Cuvinte cheie: accident de muncă, membru inferior, sindromul de strivire, amputația cauzată de traumă, disfuncție organică

INTRODUCTION

The incidence of work related injuries is high worldwide. More than 300 million accidents happen during work and are responsible for almost 2 millions of deaths. The incidence of crush syndrome is 2-15% in all trauma patients and frequently can determine trauma-related amputations, especially if the lower limb is involved and the main mechanism is crushing. Crush syndrome is the systemic manifestation of rhabdomyolysis due to muscles reperfusion injury that happened when the compressive forces on the tissues are released, being often related with occupational accidents[1].

This type of patients are at risk of developing cardio-vascular instability, renal failure, organ dysfunction, disseminated intravascular coagulation, compartment syndrome and metabolic abnormalities[2]. The treatment is multimodal and high standard intensive care measures should be initiated immediately to prevent and treat all the complications that can appear[3]. In this paper we

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reported a case of a work related injury with the avulsion of the femoral neurovascular bundle which lead to the above-knee amputation and triggered a cascade of life-threatening complications.

CASE REPORT

A 47-year-old man was admitted in the Emergency Unit for management of irreversible lower limb ischemia due to severe crush injury after a work-related accident. A series of investigation were made. During admission, a full-body computed tomography scan (CT-scan) was performed revealing low density in the anterior muscular compartment of the thigh, bladder, scrotal and pelvic hematoma, without any bone fractures. The angiography showed occlusion of the femoral artery in the proximal third segment. After that he was transported into the operating room in order to perform above-knee amputation of the lower right limb due to an irreversible avulsion of the femoral neurovascular bundle and severe crush injuries of the lower limb. After surgery, the patient was admitted in the Intensive Care Unit (ICU).

At the admission, the patient's condition was extremely severe, with the necessity of mechanical ventilation and intubation, with clinical signs of hypovolemic shock unresponsive to fluid replacement, blood transfusion and under vasopressor therapy, clinical signs of hypothermia, oliguria, with hemorrhagic soaked amputation stump dressing and important scrotal swelling. The pupils were equal, reactive with no signs of cerebral ischemia.

The standard lab test revealed severe anemia (2.3 g/dl), thrombocytopenia, leukocytosis, severe coagulopathy (INR 9.91), rhabdomyolysis syndrome (CK-MB 76000 U/L), hyperkalemia, myoglobinuria, severe metabolic acidosis.

After clinical and para-clinical examination, the patient was diagnosed with above-knee surgical amputation of the lover limb due to irreversible ischemia after severe crush injury, hemorrhagic shock and acute kidney failure.

In the second day he was transported into the operating room for an intra-abdominal hemorrhage due to a posttraumatic liver lesion. A classic hepatorrhaphy was made to stop the bleeding.

The patient underwent a series of surgical procedures using modern hemostasis techniques, massive blood transfusion and derivative, fluid replacement therapy, vasopressor and inotrope support, antibiotics, and renal substitution therapy which significantly improved the general condition and allowed extubation to be successfully performed after 13 days.

At the 26th day, the patient developed convulsive crisis followed by ischemic stroke in the fronto-parietal area confirmed by brain CT scan (Figure 1). A Doppler ultrasound was performed to remove the suspicion of carotid artery thrombosis. The clinical examination revealed left facial paralysis and hemiplegia. After heparin and anticonvulsant therapy, the clinical signs were in remission. A new CT scan was made and revealed the absence of initial lesions.

Then, when everything seemed to be better, an episode of nausea and vomiting occurs, for which an upper gastrointestinal endoscopy is performed and reveals erythematous antral gastritis. Specific therapy is administered. The patient's evolution is favorable, he is cardio-pulmonary stable, able to eat and move by himself. He was dismissed from the ICU and transferred to the department of orthopedics.

After three months, the patient presented clinical signs of bronchopneumonia complicated with pleural effusion, which was confirmed using thoracic CT-scan (Figure 2-4). A pleurostomy was installed and specific antibiotics were administered. The general condition of the patient continuously deteriorated. After three days, he was readmitted in the ICU with dilatative cardiomyopathy (Figure 5) and severe systolic dysfunction (ejection fraction of 15%) confirmed using echocardiography. He received specific treatment but the left ventricular function never improved.

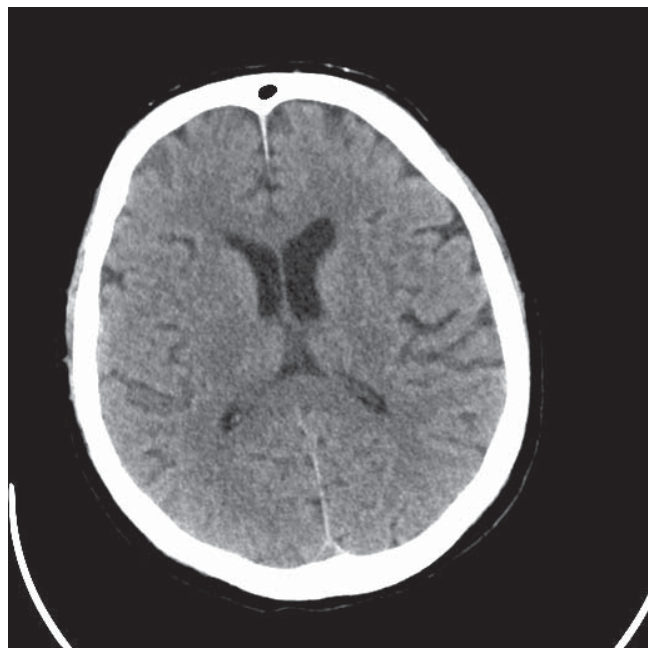

Figure 1. Fronto-parietal hypodensity and periventricular edema.

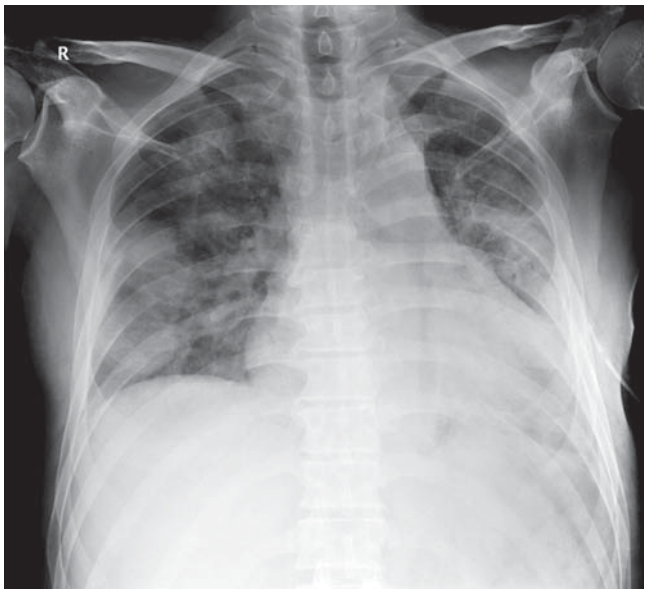

Figure 2. Radiological aspect of bronchopneumonia and cardiomegaly.

Figure 3. CT-scan revealing structural interstitial changes of the right upper pulmonary lobe, resembling ground glass opacity.

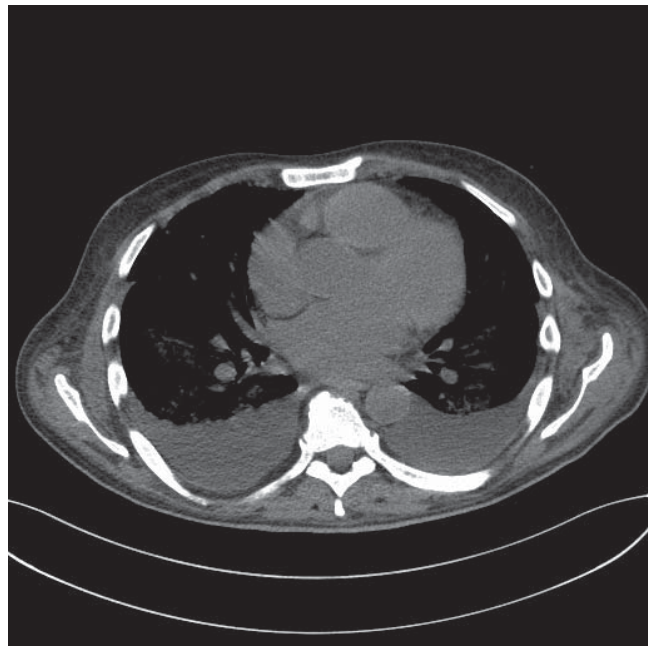

Figure 4. CT-scan revealing bilateral pleural effusion.

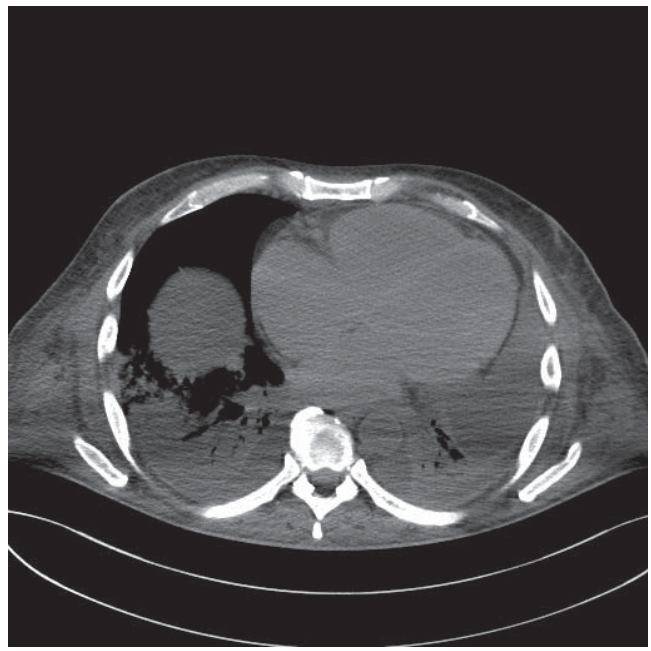

Figure 5. CT-scan revealing dilatative cardiomyopathy.

As it was expected, the patient developed mixed anxiety depressive disorder after four months of being hospitalized and losing a limb which has been treated accordingly. After following the psychotherapy sessions, he was finally able to be discharge. The patient social rehabilitation becomes the burden of his family doctor.

DISCUSSION

After severe trauma injury, in order to prevent MSOF and death, high standard intensive care should be initiated immediately[4]. The most dangerous complication of this type of accident are represented by rhabdomyolysis, compartment syndrome and acute kidney injury[5].

In our case, despite fluid replacement, massive blood transfusion and derivate, repeated hemostasis surgical procedures, the blood pressure and the hemoglobin level were low for the first few days[2]. This mandatory aggressive therapy prolonged the period of mechanical ventilation due to the pulmonary complications related to the massive transfusion. The hypercoagulable state associated with major trauma and the series of surgical procedures, led to ischemic events such as cerebral ischemic stroke. The patient needed renal replacement therapy for acute kidney injury but the renal function was fully restored after the acute phase of shock. A particular aspect of this case was the unpredictable evolution, the patient losing not only his lower limb, but a significant amount of the heart function after onset of dilatative cardiomyopathy.

CONCLUSION

Work-related accidents can be life-threatening and should be treated accordingly. Trauma-related amputation is frequent, especially if the extremities are involved. In the presence of a crush syndrome, intensive care measures should be performed. The treatment for this particular cases should be aggressive, in order to maintain vital functions and to prevent further complications. However, when you think that the fight is almost over, a new organ failure may occur and threaten the life of the patient.

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