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RESEARCH ARTICLE

VERTEBROMEDULLARY BLADED WEAPON IN 14 CASES

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ABSTRACT

Introduction: Vertebral spinal injuries are most often closed. Stab wounds are rarer, but likely to be life-threatening and functional due to their neurological and infectious complications. The objective of this work is to report our experience in the management of spinal cord wounds by stab wounds through 14 cases admitted urgently to our department. **Material and methods:** Fourteen (14) cases were collected at the neurosurgical department of the National Hospital Center of Nouakchott (CHN) between 2010 and 2024. All our patients benefited from a clinical and paraclinical study and surgical treatment. The average age was 23 years with a range of 7 to 42 years. All patients are male. The clinical examination found CSF flow in 9 cases, paraplegia in 7 cases, and Brown-Séquard syndrome in 6 cases. Three patients presented with the blade implanted in the spine. Spinal CT was performed in all patients and MRI in 10 patients showing a dural breach in seven (7) cases with spinal cord contusion in 4 cases. The site was cervical in three (3) cases, dorsal in six (6) cases and lumbar in five (5) cases. All our patients benefited from surgical treatment (trimming and duralplasty and extirpation of the weapon) followed by medical treatment.**Conclusion:**Vertebromedullary stab wounds are rare, but more serious and the frequency of spinal cord injuries requires a precise injury assessment for rapid initial treatment to avoid infectious and/or neurological complications.

INTRODUCTION

Vertebral spinal injuries are most often closed. Stab wounds are rarer and represent approximately 20 - 25% of all spinal cord injuries [2–4], but are likely to be life-threatening and functional due to their neurological and infectious complications. They mainly occur after an attack or a suicide attempt [6]. The objective of this work is to report our experience in the management of spinal cord wounds by stab wounds through 14 cases admitted urgently to our department over a period of fifteen (15) years.

They occur as the third etiology of open spinal cord injuries, after firearm injuries and road accidents [2].

Observations

We report fourteen (14) cases of blows from a penetrating object to the spine (cervical (4) cases, dorsal (6) cases and lumbar (4) cases).

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The clinical examination found CSF flow in 9 cases. One of the patients presented (more CSF flow through a 1.5 cm lumbosacral wound) a subumbilical bruise linked to the path of the stab which passed through the abdominal cavity but without damaging the abdominal wall.

All of our patients were admitted urgently for open trauma to the spine following an attack with a stab (often a stab). The emergency response time ranges from 30 minutes to 4 hours. All our patients complained of back pain and neurological disorders such as paraplegia in 7 cases and Brown-Séquard syndrome in 6 cases. Three patients presented with the blade implanted in the spine (fig 1).

Spinal CT (fig 2) was performed in all patients and MRI in 10 patients.

Magnetic resonance imaging (MRI) revealed several spinal cord contusions facing D5, D7 and D8.

Management: All our patients benefited from surgical treatment (trimming and duralplasty and extirpation of the weapon) followed by medical treatment.

The postoperative course was marked by complete recovery in 7 patients and partial recovery in 5 patients and an infectious complication in one patient after a week of surgery marked

by an infectious syndrome associated with stiff neck with intense lower back pain and explorations. Concluded that it was bacterial meningitis and L4-L5 spondylodiscitis. This complication was managed with appropriate antibiotics with a favorable outcome.

DISCUSSION

A bladed weapon is a weapon with a blade or point; it's piercing and/or sharp and does not use the force of an explosion but is likely to cause damage along its path [5]. The incidence of knife wounds ranks third in the United States as a common cause of penetrating spinal cord injuries (26%) [5].

Knives are less frequently involved, except in Africa, particularly in socially disadvantaged areas [2].

The vast majority of patients suffering from vertebral-medullary wounds caused by stab wounds (often knives) are young adult males, as was the case with our patients.

The point of impact varies, with back injuries being predominant.

Spinal injuries are less severe in stab wounds compared to those seen in firearm injuries. Pathologically, the lesions are characterized by section or compression of the spinal cord by extradural hematoma, contusions and/or edema with or without bone bursting [1].

The diagnosis is easy in the event of a spinal wound with clear neurological involvement. Neurological deficits are frequent and polymorphous. In other situations, spinal cord injuries may go unnoticed, especially if the wound entry point is far from the spine, and clinical symptoms are inconspicuous or difficult to interpret due to associated injuries [6]. True Brown-Séquard syndromes have been reported in the literature by Andrew D. and Douglas Gentleman, as in our observations [7–8].

In the absence of neurological deficits, the scanner makes it possible to study the bony structures, the trajectory of the stab wound and the presence of pneumorachis. Husain et al. [9]

MRI of the spine remains the only gold standard examination that can identify spinal cord lesions and assess disco-ligament integrity. El ahmadi et al. [1, 10].

There remains much controversy regarding the management of patients with penetrating spinal cord injuries [11]. There is no consensus on the indications for urgent surgical intervention in the first hours.

Indeed, surgical intervention is only indicated in the event of compression due to a bone fragment, a piece of tear or a compressive hematoma, or in the event of persistent CSF leak. It consists of a laminectomy, followed by spinal cord decompression and removal of the white tear if it is still in place, and ends with hermetic closure of the dura mater after plasty [12].

Management is based on a precise and urgent clinical diagnosis, surgical exploration by debridement, decompression or duralplasty, and effective prophylaxis against meningitis [8]. The role of high dose corticosteroid therapy is very debatable, even if the NASCIS study shows that the use of methylprednisolone in humans is beneficial in combating the different mechanisms leading to spinal cord ischemia [2].

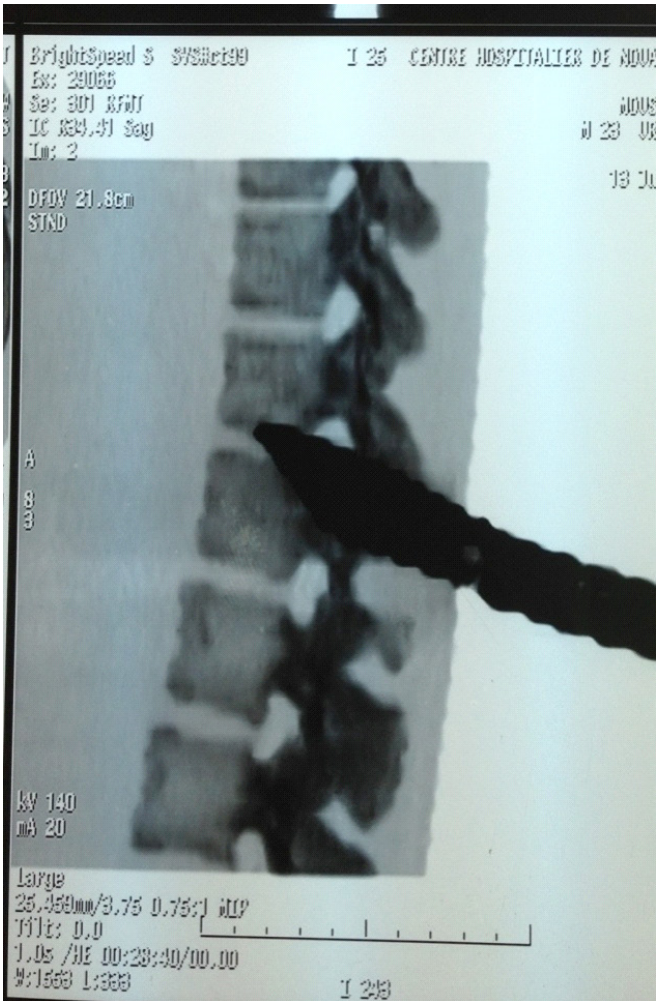
However, the impact of treatment on long-term neurological recovery remains uncertain [11].

Surgery has proven to be beneficial in our patients.

The prognosis of vertebro-medullary wounds depends on the extent of the lesions. Minimal lesions, or absence of lesions on imaging, favor a good prognosis, whereas transectional lesions of the spinal cord, contusive and hemorrhagic have a poor prognosis [1].

The nature of the sharp object, the degree of the initial

Fig.1 The bladed weapon implanted in the spine



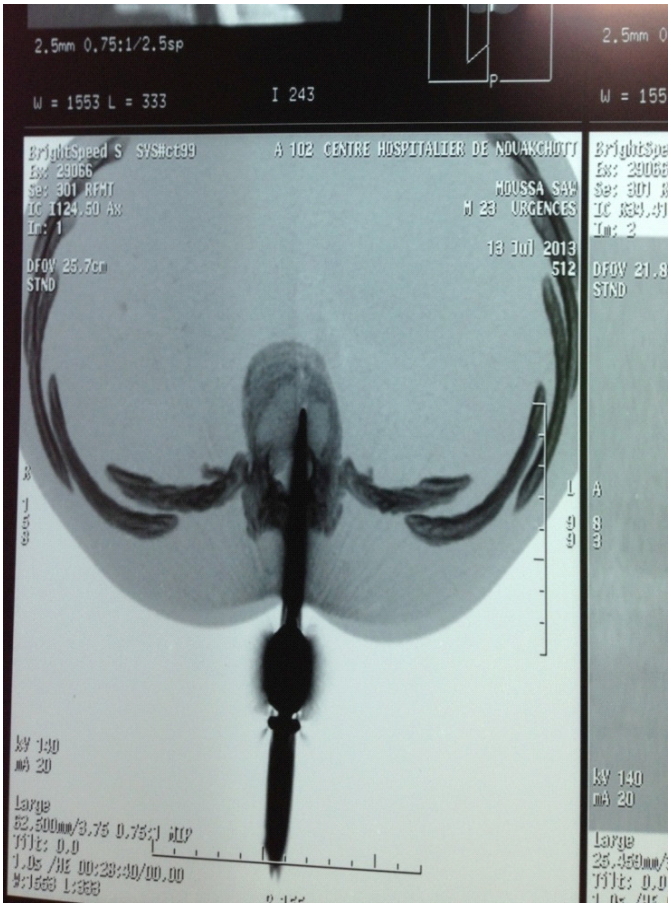


Fig.2 Lumbar scan showing the bladed weapon (knife) implanted in the lumbar spine.

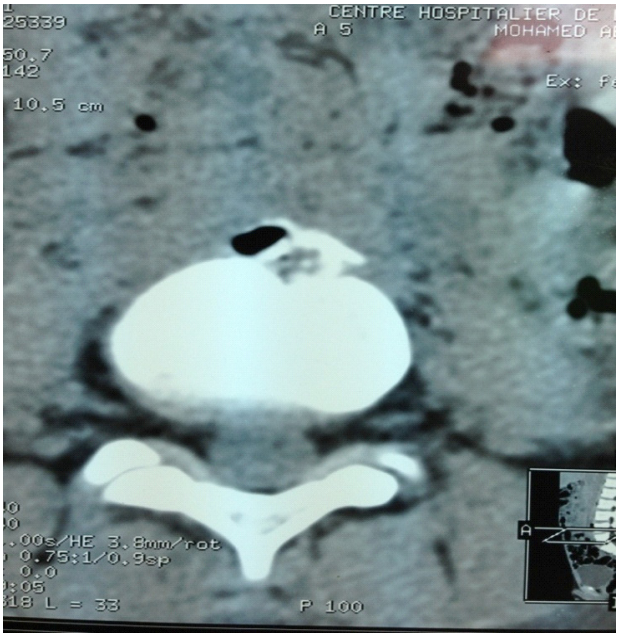


Fig.3 Lumbosacral scan showing the path of the bladed weapon (sharp object)

neurological deficit and the delay in treatment are the main factors influencing the prognosis of vertebro-medullary wounds. In fact, knife wounds have a good prognosis (if the knife) is longitudinal and not transverse, with functional improvement reaching 60% of cases, compared to 40% of those involving firearms [1].

Initial neurological status is the key factor in determining the likelihood of long-term neurological recovery. Some degree of neurological recovery is possible in cases of complete spinal cord injury if improvement is observed within 24 hours of the accident.

After one year of progress, 88 to 95% of patients remain in complete condition.

Quadriplegia or paraplegia, and only 2 to 7% recover some mobility.

Incomplete spinal cord injuries have a high healing potential, but there is no clinical or biological way to assess this with certainty. Thus, walking will be possible in 90% of patients with Brown-Séquard syndrome, in 50% of patients with intramedullary syndrome, and in only 10 to 20% of patients with a previous spinal cord injury. The after-effects are associated with cutaneous, neuro-orthopedic, urogenital, digestive pain, and neuro-vegetative problems [2].

Vertebro-medullary wounds are associated with a certain number of complications: CSF fistulas. CSF can infiltrate into the pleura or peritoneum or outward through a break in the skin.

Infectious complications have become rare since the systematic use of antibiotics in combination with careful surgical treatment. Although there was one case of dural tear, there were no infectious complications and antibiotic prophylaxis would explain this.

CONCLUSION

Vertebro-medullary stab wounds are rare, but more serious and the frequency of spinal cord injuries requires a precise injury assessment for rapid initial treatment to avoid infectious and/or neurological complications.

Conflicts of interest:

The authors declare no conflict of interest

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