Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ijnt

Original Article

Spinal stab injury: A rare injury and individualized management

Sudheesh Ramachandran [a,1], Chirag Solanki [a,1], Dhananjaya I. Bhat [b], Bhagavatula Indiradevi [d,*], Raman Sharma [c]

[a] Senior Resident, Department of Neurosurgery, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India
[b] Additional Professor, Department of Neurosurgery, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore, Karnataka, India
[c] Assistant Professor, Department of Neurosurgery, Aligarh Muslim University (AMU), Aligarh, Uttar Pradesh (UP), India
[d] Professor and Head, Department of Neurosurgery, NIMHANS, Bangalore 560029 India

ARTICLE INFO

Article history:
Received 12 June 2014
Accepted 2 December 2014
Available online 17 December 2014

Keywords:
Spinal stab injury
CSF leak
CSF diversion
Dural tear
Dural patch repair

ABSTRACT

Aims: The spinal stab injuries being very rare, there have been no established management guidelines. Our aim is to establish an algorithm for management of this injuries.
Methods: We in our study report three cases of spinal stab injury which were managed individually. All of them were managed by different modalities of treatment with satisfactory results. Analyzing the different management protocols applied to each case, we try to formulate an algorithm for management of these rare injuries.
Results: Out of three cases reported, one of the spinal stab injury patient was managed conservatively as there was no CSF leak. Other patient was managed with CSF diversion as patient had delayed wound CSF leak following wound repair. In contrast our third patient underwent direct primary repair of dural defect as he presented early with CSF wound leak. Analyzing these three patients we propose an algorithm for management of spinal stab injuries.
Conclusion: The spinal stab injuries are very rare without established management protocols. In this case series we emphasize on individualized management. The simple algorithm proposed here can be useful in managing spinal stab injuries. A timely appropriate intervention can improve the outcome in spinal stab injury patients and unnecessary interventions can be avoided.

* *Corresponding author*. Tel.: +91 80 26995409; fax: +91 80 26564830.
E-mail address: bidevidr@gmail.com (B. Indiradevi).
[1] Contributed equally.
http://dx.doi.org/10.1016/j.ijnt.2014.12.003

1. Introduction

The spinal injuries can be due to penetrating and non-penetrating trauma. The penetrating spine injuries (PSI) are divided into missile and non-missile PSIs. Spinal stab injuries are a type of non-missile PSIs and an uncommon of all spinal injuries. The incidence of these injuries is more in the region of South Africa with majority of cases reported from that region.[1] The spinal stab injuries constitute less than 1.5% of all spine injuries.[1–3] The most common site of spinal stab injury is thoracic spine followed by cervical and the lumber spine. The craniovertebral junction is the least common site reported.[4–6] The spinal cord injuries can be complete or incomplete. In complete injuries there is complete loss of sensory and motor functions below the level involved. In contrast any sparing of function at lowest sacral levels is considered as incomplete injury. The incomplete injuries are more common than complete injuries.

The stab wounds of the spine are usually on back as these injuries occur commonly when attacked from behind. The upper part of spine is more accessible for stabbing. This is the reason why cervicothoracic region is commonly involved in stab injuries. On most instances the deep penetration and thus injury to cord is prevented by bony architecture of spine. But on rare occasions sharp weapon may find the way to dura and spinal cord generally with injury to the bone. The issues in these type of injuries include the management of wound, dural tears & cerebrospinal fluid (CSF) leak and relieving spinal cord compression due to hematoma or bone fragments. In addition, injuries involving osteoligamentous complex causing instability caused by high impact stab injuries especially in mobile segments of spine like cervical and lumbar region may require instrumentation and fusion. If the abdominal viscus or vascular injuries are associated with spinal stab, an alliance with general surgeon or vascular surgeon may be required. As these type of injuries are uncommon, there is no established consensus regarding the management.

Here we are presenting three cases of spinal stab injuries with emphasis on individualized management protocol.

2. Case discussion

2.1. *Case 1*

This 35 years old gentleman presented with alleged history of assault with long sharp knife on the neck, head and face. He was seen in our hospital around 40 h following trauma. All of these wounds were cleaned and sutured in a local hospital and were healthy.

On examination patient had a sutured sharply cut wound of 3 cms length running horizontally in midline in upper part of neck on the left side. There was no redness or other signs of infection or CSF discharge. There was no respiratory distress. He had weakness of all four limbs. The power in bilateral upper limbs and left lower limb were 0/5 as per Medical research Council Scale (MRC Scale) in all the groups. The power of proximal right lower limb was 0/5 and distally it was 4/5. There was no sensory impairment. The deep tendon reflexes (DTRs) were absent in both the upper limbs and left lower limb. The DTRs were elicitable in the right lower limb. Patient had urinary and fecal incontinence. He was catheterized for urinary incontinence.

He was evaluated with MRI scan of cervical spine which showed partial cord transection at C2–C3 level. (Fig. 1) There was no hematoma or bone injury. The tract the weapon had traversed through between the spinous processes of C2 and C3 vertebrae was seen.

This patient was managed expectantly as there was no CSF leak from the wound. He was started on empirical antibiotics. Simultaneously neuro-rehabilitative program was also

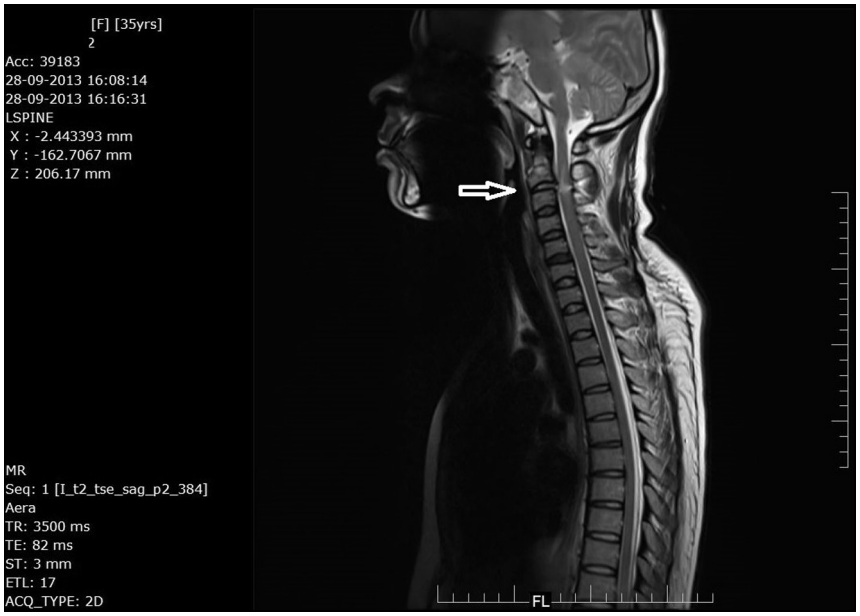

Fig. 1 – This T2W MRI of cervico-dorsal spine showing (arrow) cord injury at the level of C2–C3.