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Cervical spinal cord tetraplegia in adults is not only post-traumatic. About 28 cases

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Abstract

Tetraplegia is paralysis of all four limbs. It is due to a lesion, partial or complete, of the spinal cord, most often at the cervical level.

We carried out a retrospective study over a period of 55 months (4 years and 7 months), from June 01, 2017 to December 31, 2021 from the files of patients referred for assessment by magnetic resonance imaging (MRI) in a context of sensorimotor deficit of the four limbs with or without notion of spinal trauma, with as judgment criterion the demonstration of cervical spinal cord abnormalities responsible for the symptoms presented by the patients.

We collected twenty-eight (28) patients, with an average age of 46 years old, and extreme ages of 17 and 80 years old. We noted a male predominance with a sex ratio of 1.3 in favor of male sex.

Our patient history was dominated by cervical spine trauma in 68% of cases. The symptomatology presented by the patients was mainly represented by tetraplegia in 88% of cases, followed by respiratory distress in 9% of cases.

Spinal cord contusion dominated the etiologies in 43 % of cases, followed by cervicarthrotic myelopathy in 32% of cases.

MRI is the radiological modality of choice in the evaluation of cervical spinal cord involvement in tetraplegic patients.

Key words: Tetraplegia; Cervical; Spinal cord; Etiology.

Introduction

Quadriplegia is defined as paralysis of all four limbs. Sudden onset tetraplegia is at least a diagnostic emergency, sometimes a therapeutic one.

The goal of our study is to show the interest of MRI in the characterization of cervical spinal cord lesions in the tetraplegia and to determine their origin.

Materials and methods

We carried out a retrospective study over a period of 55 months (4 years and 7 months), from June 01, 2017 to December 31, 2021 from the files of patients referred for assessment by magnetic resonance imaging (MRI) in a context of sensorimotor deficit of the four limbs with or without notion of spinal trauma.

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The judgment criterion was the demonstration of cervical spinal cord abnormalities responsible for the symptoms presented by the patients.

Data processing were performed using Excel software.

Results

- Twenty-eight (28) patients were collected.
- Average age: 46 years old. Extreme ages: 17 and 80 years old.
- Sex: 16 men and 12 women.

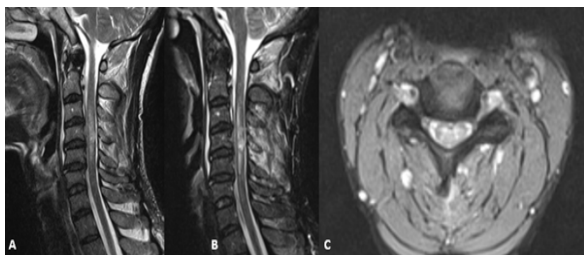


Figure 1: Cervical medullary MRI. T2 and T2 STIR Sagittal (A and B) and T2 axial (C) sequences. : Swollen aspect of the cervical spinal cord extended from C3 to C5 seat of T2 heterogeneous signal, related to spinal haemorrhagic contusion in a 45-year-old patient with cervical trauma. Note an infiltration of the posterior cervical soft tissues.

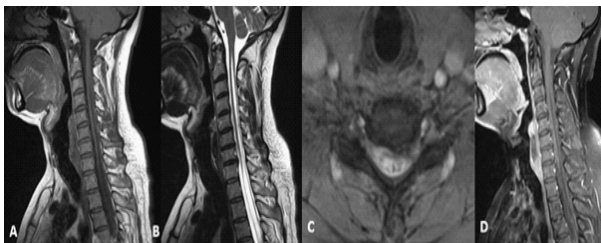


Figure 2: Cervical medullary MRI. T1, T2 and T1 after injection of gadolinium sagittal sequences (A, B and D) and T2 axial (C) : Intramedullary fusiform formation, extended from C2 to next to D5 of liquid signal on all the sequences, not enhanced after injection of gadolinium, related to a syringomyelic cavity in a 44-year-old patient with a history of cervicodorsal meningomyelitis.

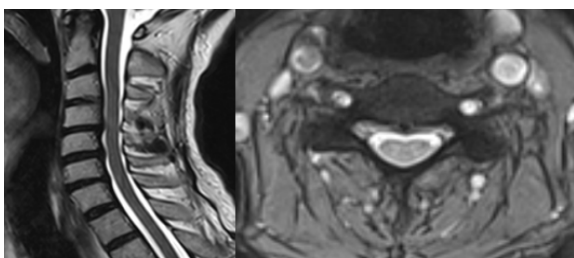


Figure 3: Cervical medullary MRI. T2 Sagittal and axial sequences: Disc protrusions associated with anterior and posterior osteophytic prominences predominating in C4-C5 and C6-C7 making imprints on the anterior and posterior epidural space and T2 spinal cord hypersignal next to C4-C5 in a 66-year-old patient, related to cervicarthrotic myelopathy.

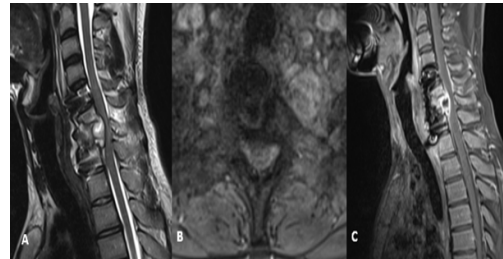


Figure 4: Cervical medullary MRI. T2 and T1 after injection of gadolinium (A and C) and T2 axial (B) sequences : Burst fracture of the vertebral bodies of C6 and C7 with retraction of the posterior wall, responsible for a reduction in the lumen of the medullary canal and medullary T2 hypersignal at this level. Note exaggerated anterior and adjacent posterior epidural enhancement in a 24-year-old patient who had suffered a trauma to the cervical spine treated by osteosynthesis.

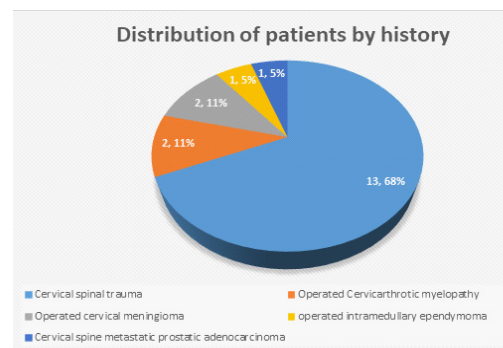


Figure 5:

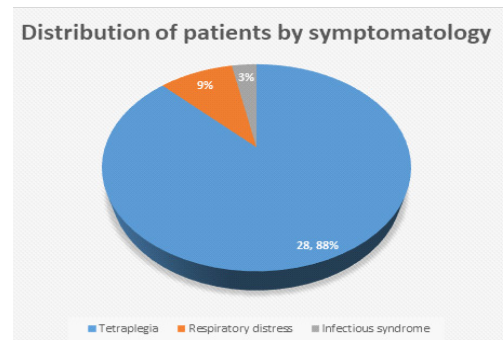


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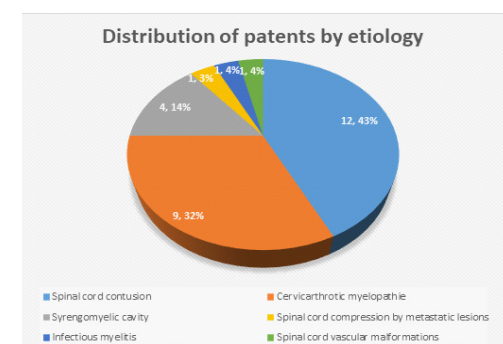


Figure 7:

Discussion

Tetraplegia is the result of spinal cord injury or vascular, tumoral or infectious spinal cord lesion with a level equal to or greater than C8. Classified by American Spinal Cord Injury Association (ASIA) A, it is characterized by a complete sensorimotor deficit beyond three medullary segments below the level of the cervical lesion [1].

The etiology of acute non-traumatic myelopathies includes systemic disorders, primary vascular angiitis, vertebral hemorrhage due to vascular malformations or infarcts due to cardiovascular embolisms and hypotension [2].

Cervicarthrotic myelopathy is a clinical syndrome related to the decrease in the dimensions of the spinal canal, cervicarthrosis is the main etiology after 50 years [3-5].

Degenerative lesions of the spine which begin relatively early, from the age of 20, represent the main etiology of cervical myelopathy. They seem to be favored by the number of stresses on the spine in certain professions, previous traumas (rugby players) and are earlier and more frequent in patients with abnormal movements [6].

Infectious causes such as meningomyelitis also cause quadriplegia [7].

Intraspinal hypotension largely as a result of spinal anesthesia in obstetrics is also implicated in the occurrence of tetraplegia [8].

There is no national epidemiological registry on quadriplegia. The incidence of traumatic tetraplegia decreases over time, but increases in proportion to paraplegia. The level of the lesion appears higher and higher, but the lesions are then more and more incomplete, and the average age higher. Above the age of 60, falls become the first cause of cervical lesions.[9]

Conclusion

MRI is the radiological modality of choice in the evaluation of cervical spinal cord in tetraplegic patients. It precises the lesions nature and indicates the spinal cord involvement level.

Competing interests: The authors declare no conflict of interest.

Contributions from authors: All the authors contributed to the conduct of this work. They also state that they have read and approved the final version of the manuscript.

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