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TREATMENT OF POST-TRAUMATIC SYRINGOMYELIA WITH SYRINGO- SUBARACHNOID SHUNT: CASE REPORT

Rogério Santos Pacheco

Neurosurgeon, Coordinator of the Neurosurgery Service at Hospital Infantil Francisco de Assis, Member of the Brazilian Society of Neurosurgery, Cachoeiro de Itapemirim, ES-Brazil

Antonio Carlos Monteiro Braconi

Orthopedist, Spine Surgeon, Member of the Brazilian Spine Society, Vitória, ES- Brazil.

Bruna Bastos Pacheco

Academic of Medicine, Faculty of Medical Sciences of Minas Gerais, Belo Horizonte, MG-Brazil

Camila da Costa Resende

Neurologist, Neurophysiologist, Member of the Brazilian Society of Neurophysiology, Vitória, ES-Brazil

Luiz Gustavo Vieira Rodrigues

Anesthesiologist, Member of the Brazilian Society of Anesthesiology, Cachoeiro de Itapemirim, ES-Brazil

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Abstract: Case presentation: A 52-year-old male patient suffered a motorcycle accident in 2005, resulting in a fracture of L1-L2 and hospitalization for 57 days due to ASIA B (level T12) and sphincter impairment. After 4 months of conservative treatment, he improved to ASIA D/E with partial sphincter control. In 2018, he presented motor deficit on the right and was diagnosed with thoracic to lumbar syringomyelia, undergoing surgery with another team, which worsened his symptoms (Frankel B). With physiotherapy, he reached ASIA C/D, but still used a wheelchair. Nine months later, symptoms appeared in his upper limbs and an MRI scan showed syringomyelia throughout his spinal cord. On 11/2023, he was examined with ASIA C, requiring a wheelchair and with severe neuropathic pain and dysautonomia. On 04/2024, he underwent surgery with T4-T5 laminectomy and syringo-subarachnoid shunt. The myelotomy was guided by direct stimulation of the median raphe and microsurgical dissection up to the syringomyelic cavity, with placement of a catheter for external shunting, resulting in improvement in neurological potentials, neuropathic pain and sphincter function. The patient is currently in ASIA D/E, walking with a walker. **Discussion:** Post-traumatic syringomyelia is a condition where a cavity filled with cerebrospinal fluid forms in the spinal cord after trauma, even without apparent clinical injury. Initial symptoms include pain, dysesthesias, sphincter and autonomic disorders, reflex changes, cramps and muscle spasms. In advanced stages, motor deficits and greater functional dependence occur. The pain is described as burning or stabbing and can worsen with movement or pressure. The condition is rare, but more common after spinal cord injuries (1-7% develop symptomatic syringomyelia), affecting mainly men due to greater exposure to accidents. Diagnosis is made by MRI, and treatment is usually surgical, as conservative treatment tends to lead to neurological deterioration. Surgery results in

symptom improvement in approximately 90% of patients. **Final comments:** The syringo-subarachnoid shunt is described as an effective surgical intervention for the treatment of syringomyelia, as seen in the clinical case presented. The use of intraoperative neurophysiological monitoring is recommended for best results.

Keywords: Syringomyelia; Post-traumatic; Neurosurgery.

INTRODUCTION

Post-traumatic syringomyelia is characterized by the formation of a cavity filled with cerebrospinal fluid (CSF) inside the spinal cord. As the name suggests, this specific form of syringomyelia arises after trauma, regardless of the presence of obvious clinical damage to the spinal cord.

Syringomyelia is a relatively rare condition in the general population, but its occurrence is more frequent after a spinal cord injury. There are no known racial or ethnic predispositions for post-traumatic syringomyelia. However, the condition is more common in men, who are more often involved in car accidents and high-risk activities resulting in spinal cord trauma. Approximately 1 to 7% of people with a spinal cord injury develop symptomatic syringomyelia.

Although diagnostic advances, such as magnetic resonance imaging (MRI), have improved the early identification of the disease, the management of post-traumatic syringomyelia still represents a challenge, especially in complex cases involving progressive neurological deficits. Case reports play a fundamental role in this context, by documenting real clinical experiences that contribute to the dissemination of knowledge about unusual presentations, therapeutic approaches and the results of specific treatments. This report discusses the application of the syringo-subarachnoid shunt technique in a patient with extensive post-traumatic syringomyelia.

OBJECTIVES

The aim of this study was to present a clinical case about the neurosurgical treatment and evolution of post-traumatic syringomyelia using the syngo-subarachnoid shunt.

METHODOLOGY

This is a descriptive case report. The information was obtained after clinical anamnesis with the patient, review of medical records and data collection with the medical team responsible for monitoring the case and performing the surgery. For the literature review, the theoretical and scientific basis was based on articles, case reports and bibliographic reviews found in PubMed, Virtual Health Library (VHL) and Scielo databases.

CASE PRESENTATION

A 52-year-old male patient suffered a motorcycle accident in October 2005, resulting in a fracture of L1-L2 and hospitalization for 57 days due to ASIA B (sensory/motor level T12) and sphincter impairment. After four months of conservative treatment, there was improvement to ASIA D/E and partial sphincter control with occasional losses. In August 2018, he presented motor deficit on the right, from the cervical region to the ipsilateral lower limb, and was admitted to hospital with another team of neurosurgeons. An MRI scan revealed syringomyelia from the thoracic to the lumbar region. He underwent surgery for spinal decompression and possible communication of the syringomyelia with the subdural space, but his symptoms worsened, returning to Frankel B and worsening sphincter involvement. With motor physiotherapy, he reached ASIA C/D, being able to walk short distances with a walker, but he still needed a wheelchair. Nine months later, she presented symptoms in her upper limbs and an MRI scan showed syringomyelia of the entire spinal cord (holocord, C1 to T12). In November 2023, he was

examined with ASIA C, requiring a wheelchair and suffering from severe neuropathic pain and dysautonomia. In April 2024, surgery was performed with decompression of the spinal canal (T4-T5 laminectomy) and syngo-subarachnoid shunt. During surgery, cerebrospinal fluid hypertension was detected when the dural sac was opened. Myelotomy was guided by direct stimulation of the median raphe and microsurgical dissection up to the syringomyelic cavity, with placement of a catheter for external shunting. After surgery, there was an improvement in neurological potentials and hermetic closure of the dural sac without enlargement. No signs of fistula were observed and there was significant improvement in neuropathic pain and sphincter function. Current status is ASIA D/E, with walker-assisted ambulation without additional help.



Figure 1 - Preoperative T2 MRI of the cervical spine
Source: Personal collection

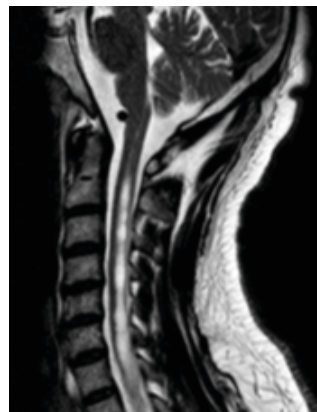


Figure 2 - Postoperative T2 MRI of the cervical spine
Source: Personal collection

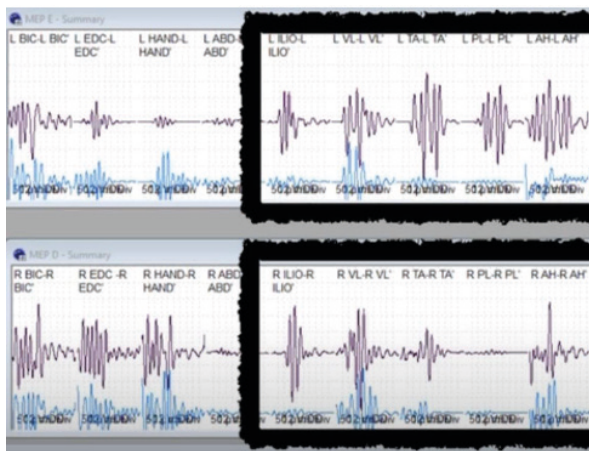


Figure 3 - PEM: significant improvement in all the previously altered muscles in MIE and improvement in iliopsoas D and tibialis anterior D

Source: Personal collection

DISCUSSION

CLINIC OF POST-TRAUMATIC SYRINGOMYELIA

The main initial symptoms in patients with post-traumatic syringomyelia include pain, dysesthesia, sphincter and autonomic disorders, reflex changes, cramps and muscle spasms. In more advanced stages, motor deficits and an increase in functional dependence are observed. Pain is the most frequently reported symptom, usually localized in the area of the lesion or diffusely below the level of the lesion. It is a neuropathic pain, often described as burning or stabbing, and can be sensitive to light touch or pressure. The pain can intensify when sitting, lying down, coughing or sneezing.

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zing. Selective loss of sensitivity to pain and temperature is common, with relative preservation of dorsal column function (touch and pressure), and these findings are considered classic.

MANAGEMENT AND DIAGNOSIS

The management of post-traumatic syringomyelia is complex, due to the risk of progressive and potentially devastating loss of sensory and/or motor function in many cases. Magnetic resonance imaging (MRI) is the imaging method of choice for the initial diagnosis of post-traumatic syringomyelia.

TREATMENT AND PROGNOSIS

The treatment of syringomyelia is challenging, especially due to the complexity of its management. The approach to the syrinx cavities is predominantly surgical, especially when symptoms and disabilities are present, as conservative treatment tends to result in progressive neurological deterioration. Surgery results in symptom improvement in approximately 90% of patients.

FINAL COMMENTS

The syringo-subarachnoid shunt has been widely described in the literature as an effective surgical intervention for the treatment of syringomyelia. Positive results, both clinical and radiological, have been documented, especially in cases of post-traumatic syringomyelia. Intraoperative neurophysiological monitoring is recommended for best results.