IMAGEM EM NEUROLOGIA/IMAGE IN NEUROLOGY

Pseudomeningocele after Brachial Plexus Root Avulsion in a Teenager: A Tragic Event

Pseudomeningocelo por Avulsão do Plexo Braquial num Adolescente: Um Evento Trágico

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We report a case of a 17-year-old male who presented to the emergency department (ED) following a motorcycle accident as a pillion passenger. Initially, he was neurologically intact (Glasgow Coma Scale 15) and complained of pain in the right arm and shoulder. Physical examination revealed shoulder edema and pain on abduction beyond 45°, with normal clavicular palpation and limb mobility. X-ray imaging showed no osteoarticular injuries, and he was discharged with analgesics and a sling.

Seven hours later, he returned to the ED with worsening severe pain in the right arm and shoulder, new-onset loss of mobility of his wrist and fingers and cutaneous sensation up to the elbow. Edema remained unchanged, and peripheral pulses were intact. Suspecting neurovascular compromise, further investigation with a Doppler ultrasound and computed tomography (CT) scan revealed patent arterial flow and fractures in the right scapula and left C6 lamina.

Evaluation by a Pediatric Neurologist showed absent spontaneous movement in the distal right limb, absent radial, biceps, and triceps reflexes, and hypokinetic pectoral reflex. While shoulder elevation and internal rotation were preserved, anesthesia in the C6-D1 dermatomes and neuropathic pain were evident. Additional findings included right ptosis and miosis, with normal sweating, suggesting incomplete Horner's syndrome, pointing to severe C6-D1 nerve root injury with impairment of the cervical sympathetic chain.

Magnetic resonance imaging (MRI) of the right brachial plexus revealed pseudomeningoceles between C6-D2 (**Figs.1** and **2**), with foraminal and extraforaminal extension, and leftward spinal cord deviation (**Fig. 3**) with absent right foraminal root pathways. These findings confirmed pre-ganglionic root avulsion of the brachial plexus.

Patient remained hospitalized for 17 days, treated with high-dose intravenous corticosteroids, physical therapy, psychological support and analgesia, needing multiple adjustments. At discharge, he maintained neurological deficits and was referred for outpatient rehabilitation.

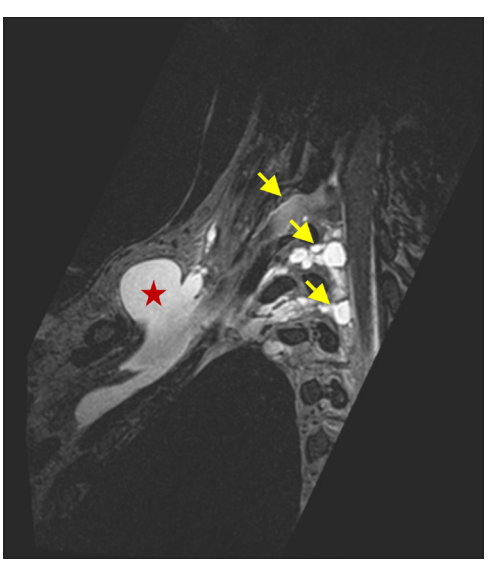

Figure 1. Brachial plexus MRI (reformatted T2-3D sequence, with oblique axial and oblique coronal slices) revealing the presence of pseudomeningoceles (yellow arrow) from the C6 root to the D2 root (coronal plane) and extension to a collection in the right upper limb (red star).

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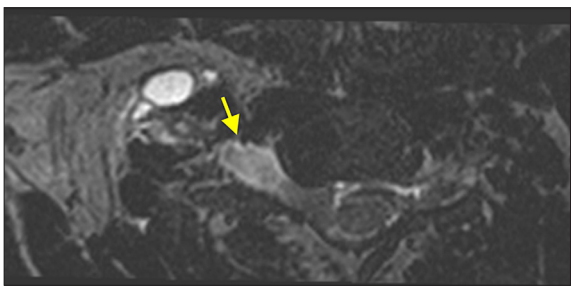

Figure 2. Brachial plexus MRI (T2 sequence, axial plane) revealing meningocele at C6-C7 level (yellow arrow), less evident due to the hematic component.

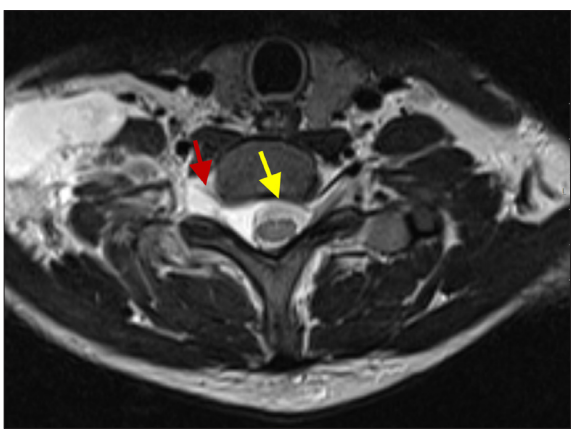

Figure 3. Brachial plexus MRI (T2 sequence, axial plane) revealing pseudomeningoceles (red arrow) and spinal cord deviation to the left at C7-D1 level (yellow arrow), without evidence of signal alterations of the spinal cord.

Traumatic brachial plexus injury (BPI) is a devastating and life-changing condition for patients and families, frequently involving sensory loss, motor impairment and disabling neuropathic pain.1 It mainly affects men aged 15-25 years with nearly 70% of BPI linked to motorcycle or bicycle accidents.[2,3]

Most injuries are closed and occur in high-velocity accidents with traction mechanism, where the arm and shoulder are forcibly pushed away from the neck or trunk. This often causes root avulsion lesions, with nerve roots being torn from the spinal cord, proximal to the dorsal root ganglion, causing a preganglionic injury with a poor recovery prognosis.[3,4] Pseudomeningocele subsequent to the tearing of the dura mater that surrounds the nerve roots, with consequent accumulation of cerebrospinal fluid (CSF) into the extradural space can be seen in MRI.[5]

Involvement of the lower brachial plexus roots may be associated with Horner syndrome (miosis, enophthalmos, ptosis, anhidrosis) due to the proximity of the sympathetic chain to the D1 nerve root.[4] Neuropathic pain affects over 50% of patients, often requiring pharmacological and surgical interventions for effective management.[3]

Although diagnosis is primarily clinical, MRI can be used as a highly sensitive and specific tool to assess injury's severity and, matched with electrodiagnostic studies, provide information on recovery potential and treatment strategies.[4] ■

Contributorship Statement / Declaração de Contribuição

CLD: Design of the article, participation in data collection-and research of bibliographic sources, writing of the manuscript.

RP: Preparation of the images. Critical review with intellectual contribution.

FP: Conception, critical review with intellectual contribution and final approval.

All the authors have read and approved the final version of the manuscript to be published.

CLD: Design do artigo, participação na colheita de dados e pesquisa de fontes bibliográficas, redação do manuscrito.

RP: Preparação das imagens. Contribuição intelectual e revisão crítica.

FP: Conceção e contribuição intelectual, com revisão crítica com aprovação final.

Todos os autores leram e aprovaram a versão final do manuscrito a ser publicado.

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