

# **Lumbar pseudomeningocele following blunt trauma without spinal fractures**

José Alberto Gonçalves da Silva<sup>1</sup>, Adailton Arcanjo dos Santos Junior<sup>2</sup>

Hospital Unimed, Department of Neurosurgery, João Pessoa, PB, Brazil.

## **ABSTRACT**

*The lumbar pseudomeningocele (PSM) is an uncommon condition, mainly, after a lumbar blunt trauma. The authors present a rare case of PSM following a lumbar blunt trauma which did not show any abnormalities in the magnetic resonance imaging (MRI) of the lumbar region. Firstly, the patient underwent to conservative treatment that fail and then it was performed a surgical approach of the lumbar area, however, the lumbar fluid collection appeared again and a lumboperitoneal shunt (LPS) was then performed with complete successful. One year and half afterwards the LPS the patient continues asymptomatic. The standard treatment of this condition remains uncertain, but the conservative treatment followed by LPS is a good option and can be done in several cases.*

## **KEYWORDS**

*Meningocele, spinal injuries, lumbosacral region, fistula.*

## **RESUMO**

### ***Pseudomeningocele lombar após trauma fechado sem fraturas vertebrais***

*A pseudomeningocele lombar é uma condição incomum, principalmente após trauma lombar fechado. Os autores apresentam um caso raro de pseudomeningocele lombar após trauma lombar fechado que não apresentou alterações na ressonância magnética da região lombar. Primeiramente, o paciente foi submetido ao tratamento conservador que falhou, sendo submetido, em seguida, à abordagem cirúrgica da região lombar, entretanto, a coleção lombar fluida apareceu novamente, sendo, então, realizada uma derivação lomboperitoneal com remissão completa da coleção. Um ano e meio após a derivação lomboperitoneal, o paciente permanece assintomático. O tratamento padrão dessa patologia ainda permanece incerto, mas o tratamento conservador seguido de derivação lomboperitoneal é uma boa opção e pode ser feito em certos casos.*

## **PALAVRAS-CHAVE**

*Meningocele, traumatismos da coluna vertebral, região lombossacral, fístula.*

1 Neurosurgical Division of the Hospital Unimed, João Pessoa, PB, Brazil.

2 Neurosurgical Division of the Hospital Beneficência Portuguesa de São Paulo, São Paulo, SP, Brazil.

## Introduction

Pseudomeningocele is an epidural cerebrospinal fluid (CSF) collection that is resulted from the communication between the subarachnoid space and the adjacent tissues, as well as with another body cavity. From the etiopathogenic aspect, PSM is divided into 3 types: iatrogenic, congenital and traumatic.<sup>1</sup> PSM is an uncommon clinical condition, most of the cases are predominantly iatrogenic and postoperative. Posttraumatic cases are rare and they are usually resulted from dural breach or nerve root avulsion.<sup>2-4</sup> Diagnosis is based on the clinical presentation associated with the imaging findings. A few cases of PSM are asymptomatic, however, some signs and symptoms are associated with the existence of PSM such as fluid mass that augment with valsalva maneuver, low-back pain and radiculopathy.

Other less common symptoms are posture-related headache, cervical pain, nausea, vomiting, photophobia and myelopathy.<sup>5</sup> Some diagnostic exams can help in the PSM diagnosis, however, magnetic resonance imaging (MRI) is considered the neuroimaging gold standard tool. PSM diagnosis is based on clinical features and imaging findings after surgical procedure or traumatism in the lumbar region.

The gold standard treatment for PSM has been currently debated and there is a variety of PSM approaches. Most authors propose the conservative management as the initial approach by bed rest, Trendelenburg position and the use of corset brace to compress the area of the PSM. McCallum *et al.*<sup>6</sup> had a good response to repeated lumbar punctures for two or three days along with Trendelenburg position. In case of failure of the conservative treatment, other methods can be useful such as epidural blood patch and closed lumbar subarachnoid drainage.<sup>7</sup> Surgical treatment for dural repair or LPS placement are used whether conservative management fails.

## Case report

A 48-year-old man presented a painful fluid mass in the lumbar area three days after a fall when he was riding a horse. Additionally to the beginning of the clinical onset he referred a moderate low-back pain that radiated down to the left leg until the ankle and presented no sensitive sign. Punction of the fluid mass was carried out and the aspirated liquid had a bloody-serous aspect. Few days afterwards this puncture, the patient presented another fluid mass with similar characteristics. X-ray of lumbar spine did not show any abnormalities.

The MRI depicted a delimited subcutaneous fluid collection with low signal intensity on T<sub>1</sub>-weighted images and high signal on T<sub>2</sub>-weighted images as well as no spinal fractures (Figure 1A-B). After 16 days of unsuccessful conservative treatment, through bed rest, surgical procedure was indicated through an open drainage of the CSF collection associated with a tight closure of the adjacent tissues. During that procedure it was not possible to find the exact location of the CSF fistula. Despite the partial relief of the low-back pain, the patient presented another lumbar collection two days after this procedure. On this occasion, a LPS was then performed resulting in progressive improvement of the low-back pain, sciatica and remission of the CSF collection. After one year and half of follow up, the patient continues asymptomatic.



**Figure 1** – Sagittal MRI showing a delimited subcutaneous fluid collection with low signal intensity on T<sub>1</sub>-weighted images (A) and high signal on T<sub>2</sub>-weighted images (B) as well as no spinal fractures.

## Discussion

PSM is an infrequent clinical condition particularly secondary to blunt trauma whose true incidence is unknown.<sup>1-10</sup> According to the literature, there is some evidence that traumatic PSM are due to fractures or bony dislocations, or still, nerve root injury.<sup>2,11,12</sup> Couture and Branch<sup>10</sup> described the existence of rare cases in the literature of PSM following blunt trauma which they were not related to nerve root injury.

This study reports a rare case of lumbar PSM following blunt trauma, without spinal fracture.

The exact pathophysiological mechanisms that underlie the formation and maintenance of the PSM remains uncertain. However, the presence of dural breach is obligatory to the PSM formation. Many theories have been presented to explain the genesis of PSM. According to Teplick *et al.* apud Hawk and Kim,<sup>5</sup> when intact arachnoid herniates throughout the dura mater, the dural breach occurs and remains open what promote the formation of PSM. When an arachnoid injury occurs, it is more likely that the communication will close. However, Tsuji *et al.* apud Hawk and Kim,<sup>5</sup> suggested that the volume of the leaked fluid is the most important etiological factor to develop PSM. If CSF leak is small, the fluid is easier absorbed and the lesion is self-limited. McLennan *et al.* apud Barberá *et al.*,<sup>13</sup> referred that small dural breaches have a higher probability in developing PSM, because its ball-valve mechanism that allows a one-way flow of the CSF fistula.

In the present report, there was no evidence of fracture or bony dislocation which could explain a direct dural injury or lumbar nerve root avulsion. The possible pathophysiological mechanisms to explain the formation of PSM is that a small dural tear occurred and might have functioned as a ball-valve mechanism, as mentioned previously by McLennan.

Diagnosis of PSM is based on the clinical features complemented by the neuroimaging findings, especially the MRI.<sup>14,15</sup> LPS is considered as a method that should only be used after failure of surgical repair.<sup>5</sup> However, some reports show success with the use of LPS in cases of CSF fistula<sup>2,16</sup> and traumatic PSM,<sup>3</sup> as reported at this present study.

## Competing interests

The authors declare that they have no competing interests.

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### Correspondence address

José Alberto Gonçalves da Silva  
Av. Minas Gerais, 1150  
58030-092 – João Pessoa, PB, Brazil  
E-mail: jags1803@hotmail.com

Adailton Arcanjo dos Santos Júnior  
Rua Martiniano de Carvalho, 880, ap. 62  
01321-000 – São Paulo, SP, Brazil  
Telefone: (055 11) 96549-3575  
E-mail: adailtonarcanjo@yahoo.com.br