

# Clival Subdural Hematoma after Drainage of Concomitant Intracranial and Spinal Cord Subdural Hematomas – Rare Case Report

## *Hematoma subdural de clivo após drenagem de hematomas subdural intracraniano e medular concomitantes – raro relato de caso*

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### Abstract

Concomitant traumatic spinal cord and intracranial subdural hematomas associated with a retroclival hematoma are very uncommon. Their pathophysiology is not totally elucidated, but one hypothesis is the migration of the hematoma from the head to the spine. In the present case report, the authors describe the case of a 51-year-old man presenting with headache, nausea and back pain after a head trauma who presented with intracranial and spinal cord subdural hematomas. Drainage was performed but, 1 week later, a retroclival subdural hematoma was diagnosed. The present paper discusses the pathophysiology, the clinical presentation, as well as the complications of concomitant traumatic spinal cord and intracranial subdural hematomas associated with a retroclival hematoma, and reviews this condition.

### Keywords

- ▶ lumbar subdural hematoma
- ▶ intracranial subdural hematoma
- ▶ retroclival subdural hematoma
- ▶ head trauma

### Resumo

Hematomas subdurais traumáticos medular e intracraniano concomitantes associados a hematomas retroclivais são condições incomuns. Sua fisiopatologia não é completamente compreendida, mas uma das hipóteses é a migração do hematoma da região encefálica para a medular. No presente relato de caso, os autores descrevem o caso de um paciente masculino, 51 anos de idade, com cefaleia, náuseas e dor lombar após sofrer traumatismo craniano. O mesmo apresentou-se com hematomas subdurais encefálico e lombar. O paciente foi submetido a drenagem e, após uma semana, retornou com um hematoma subdural retroclival. O presente artigo discute a fisiopatologia, a apresentação clínica e as complicações de hematomas subdurais traumáticos medular e intracraniano concomitantes associados a hematomas retroclivais e apresenta uma revisão do tema.

### Palavras-Chave

- ▶ hematoma subdural lombar
- ▶ hematoma subdural intracraniano
- ▶ hematoma subdural retroclival
- ▶ traumatismo craniano

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## Introduction

Concomitant traumatic spinal cord and intracranial subdural hematomas are unusual, and even rarer when associated to a late retroclival subdural hematoma.

Unlike the intracranial subdural space, the spinal cord subdural content has no bridged veins; as such, the hypothesis of rupture of vessels in this region is less plausible, and the hypothesis of migration of the intracranial hematoma to the lumbar region seems more likely.

Other possible causes for this condition include coagulation disorders, lumbar puncture, anticoagulation therapy, and idiopathic causes.

Most cases of traumatic hematomas in the posterior fossa are extradural and occur in children who suffered head injury due to automobile accidents. Its physiopathology

can be associated to ruptures of ligaments or to bone fractures at the base of the skull.

The present case report describes a case of chronic spinal cord and intracranial subdural hematoma, subsequently associated with a clival subdural hematoma.

## Case Report

Male patient, 51-years-old, with head trauma due to a wood log that fell on the right parietal region ~ 20 days before admission. The patient reported progressive headache accompanied by nausea and back pain, walking difficulties, and no improvement with common painkillers. At the physical examination, the patient presented grade IV strength in the right leg, in addition to a positive Lasègue sign on the same limb. There was no history of



**Fig. 1** (A and B) T1 and T2-weighted magnetic resonance imaging of the lumbar spine showing a subdural hematoma in L3-S2. (C) Axial T1-weighted sequence showing the lumbar subdural hematoma. (D) FLAIR sequence revealing a bilateral brain subdural hematoma. Abbreviations: FLAIR, fluid attenuation inversion recovery.

coagulopathies, of comorbidities or of use of medications. A magnetic resonance imaging (MRI) of the brain and of the lumbar spine (►Fig. 1) showed a bilateral brain and spinal cord injury with extension from the L3 to the S2 vertebrae that was isointense at T1 and T2-weighted sequences and compatible with bilateral intracranial and spinal cord subdural hematomas.

Test results for coagulopathies were within the normal limits.

The patient was then submitted to drainage of the spinal cord hemorrhage through a hemilaminectomy from the L4 to the S1 vertebrae, followed by a durotomy (►Fig. 2). In the same surgery, drainage of the intracranial subdural hematoma was performed by a trepanation in each hemisphere. Since the patient evolved stably, and the clinical picture improved after the surgery, he was discharged 4 days later. One week after the discharge, the patient complained of recurrence of the headache, and a new magnetic resonance imaging (MRI) of the brain showed a clival subdural hematoma, which we decided to follow-up in an outpatient facility.

Thirty days later, the patient came for an outpatient visit and presented improvement of the headache and of the motor deficit in the right lower limb.

Subsequently, the MRI of the brain was repeated and showed the absorption of the retroclival subdural hematoma.

## Discussion

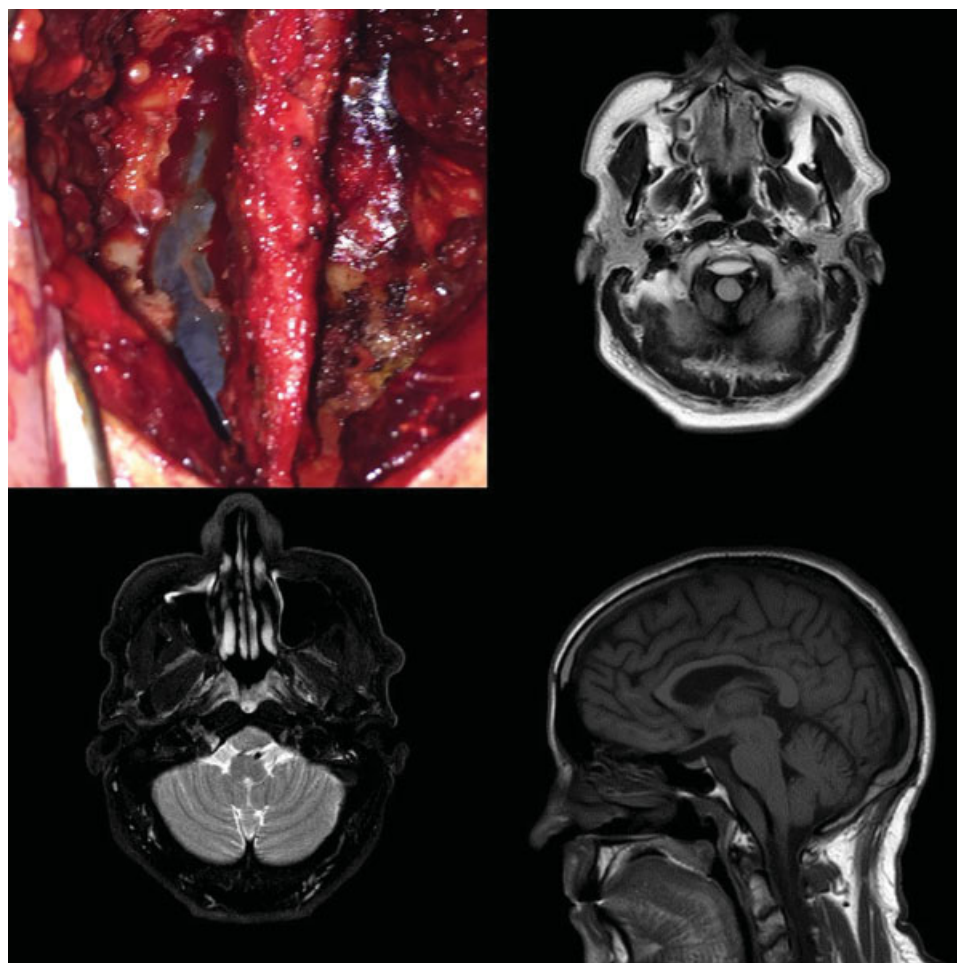
Lumbar subdural hematoma is an uncommon condition found in < 5% of the cases of lumbar hematomas in retrospective studies. The extradural hematoma is more common and was presented in ~ 74% of the patients.<sup>1,2</sup>

The present case had no coagulation disorders, had not been submitted to a recent anesthetic procedure, and had no history of lumbar puncture, although these are common associations, reaching 30% of the iatrogenic causes of lumbar subdural hematoma.<sup>3,4</sup>

The association between intracranial and spinal cord subdural hematomas is rare, with 17 cases in the literature, according to our survey.

Kokubo et al performed a prospective study with 168 patients with chronic subdural hematoma with surgical indication between August 2007 and September 2011. These patients were screened for lumbar subdural hematoma by an MRI of the lumbar spine, which revealed 2 cases with concurrent hematomas (1.2%).<sup>5,6</sup>

Our patient reported head trauma and denied any spinal trauma or falling from his own height, which seems to corroborate the hypothesis of migration of the cranial subdural hematoma to the lumbar region, as proposed by Bortolotti et al. This would be possible due to the influx of



**Fig. 2** (A) Intraoperative image of hematoma drainage. (B, C, and D) Axial FLAIR sequence, T1-weighted and sagittal T2-weighted magnetic resonance images of a retroclival subdural hematoma. Abbreviations: FLAIR, fluid attenuation inversion recovery.

cerebrospinal fluid (CSF) through the subdural space, diluting the hematoma and facilitating its migration. Moreover, according to these authors, the formation of subdural hematomas at the spinal level would be difficulted by the avascular plane of the subdural space at this site.<sup>7,8</sup>

Hung et al suggested that the higher intracranial pressure increases the shear forces between the dura mater and the arachnoid mater, creating a space in which the hematoma can progress to the region of the spinal cord.<sup>9-11</sup>

Spinal cord subdural hematomas associated with deficit can be treated by surgical drainage with laminectomy and durotomy as quickly as possible, as these procedures improve the evolution of the case, leading to recovery in 80% of the cases.<sup>12</sup>

Traumatic retroclival hematomas are mostly extradural, secondary to traffic accidents, and are more frequent in the pediatric population, presenting clinically as abducens nerve palsy. Retroclival subdural hematomas, on the other hand, account for 0.3% of all subdural hematomas. To our knowledge, there are rare reports of traumatic origin in adults, who, like in the present case, did not present with any motor deficits and evolved benignly.<sup>13,14</sup>

The physiopathology of concomitant traumatic spinal cord and intracranial subdural hematomas associated with a retroclival hematoma remains uncertain, but, as in clival extradural hematomas, it is hypothesized that these hematomas arise from a fracture or ligament rupture associated with a venous lesion.

We believe that the drainage of the spinal cord hematoma caused the migration of part of the intracranial hematoma to the clival region, leading to the late onset of headache.<sup>15,16</sup>

The treatment of clival subdural hematomas varies according to their clinical presentation; conservative therapies are preferred in cases with no deficits.<sup>17,18</sup>

## Conclusion

The association of cerebral, spinal and clival subdural hematomas is uncommon in the literature. Due to its rarity and to the lack of specificity of most of its signs and symptoms, this combination can be misdiagnosed. Its treatment depends on the clinical picture of the patient; in cases with motor deficits, surgical therapy provides a better prognosis.

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