

# Spinal Subdural Hematoma Responsible for a Syndrome of the Tail of a Horse about a Case in the University Hospital Center of Guadeloupe and Review of Literature

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## Abstract :-

**Background:** Spinal subdural hematomas (SDH), even rarer than epidural hematomas, are serious and responsible for permanent neurological deficit without adequate treatment. In this article, we report on a case of cauda equina syndrome after a lumbar puncture in a young patient.

**Case presentation:** A 19-year-old male patient who underwent two lumbar punctures 4 days apart, as part of a work-up for fever and dizziness, presented with genital-sphincter disorders. Clinical examination revealed cauda equina syndrome. MRI revealed an S1-S2 subdural hematoma. An S1-S2 laminectomy with the evacuation of the hematoma was recommended. The evolution was marked by a complete recovery of genito-sphincter disorders and sensitivity.

**Conclusion:** Spinal subdural hematoma can be responsible for neurological deficits, sometimes permanent but rarely highly compressive. Management is medico-surgical.

**Keywords:-** Spinal Subdural Hematoma, Syndrome of the Tail of a Horse, University Hospital Center of Guadeloupe.

## I. INTRODUCTION

Spinal hematomas have been described in autopsies since 1682 and as a clinical diagnosis since 1867.(1) Spinal subdural hematomas (SDH), even rarer than epidural hematomas, are serious and responsible for permanent neurological deficit without adequate treatment. The rapid investigation is essential for urgent management.(2) Acute spinal HSD following lumbar puncture is not frequently reported in the literature.

In this article, we report on a case of cauda equina syndrome following a lumbar puncture in a young patient.

## II. CASE PRESENTATION

Male patient, aged 19, athletic, with no known pathological history, who underwent two episodes of lumbar puncture 4 days apart, as part of a work-up for fever and dizziness in the neurology department. The second puncture was very painful, and the evolution was marked by the onset, within 48 hours, of sphincter disorders such as leakage of urine and stool, and erectile dysfunction, prompting a consultation in the emergency department.

Clinical examination revealed neurological damage below the S1 root: a bladder globe requiring bladder catheterization, abolition of erection for 48 hours; hypoaesthesia in the stool with hypotonia of the anal sphincter on rectal touch. No motor involvement from L2 to S1, flexion, and extension of the toes was preserved. The clinical diagnosis of cauda equina syndrome was evoked.

An MRI of the lumbosacral spine was performed urgently, showing a subdural hematoma in S1 and S2. (Fig.1)

An S1-S2 laminectomy with the evacuation of the hematoma was indicated. Under general anesthesia and orotracheal intubation, the patient underwent a laminectomy in the OR, exposing a taut, dark-blue dura mater, the opening of which revealed a subdural hematoma compressing the roots of the ponytail (Fig. 2). The hematoma was evacuated and the dura mater sutured with watertight stitches (Figs. 3 and 4).

The immediate postoperative course was straightforward, with the patient up and about on Day 1. Progression at 1 month showed good recovery of genito-sphincter signs with residual sensitivity disturbance and complete recovery of genito-sphincter and sensitivity disturbances at 6 months.

### III. DISCUSSION

#### ➤ *Epidemiology - Pathophysiology*

Spinal hematomas are rarely reported in the literature.(3) They are reported after trauma or spinal procedures in patients on anticoagulants or occur spontaneously.(4) They are frequent in elderly patients. In a meta-analysis of 613 patients, age ranged from 55 to 70 years.(1) In our case, the patient was 19 years old. In the literature, no cause is found in most reported cases of spinal SDH.(5) Cases related to anticoagulant therapy, hemophilia, or iatrogenic origin in connection with epidural anesthesia, surgery, tumor bleeding, alcoholism, and vascular malformations represent the most common causes after idiopathic subdural hematomas.(2,3,5-7) In a review of 151 patients with spontaneous acute non-traumatic subdural hematoma, 46% were on anticoagulant therapy or had a coagulopathy attributable to a hematological disorder.(8) Moussa et al. also reported a case of spinal HSD after spinal anesthesia in a patient on anticoagulant therapy.(9) Chan similarly reported a case of spinal HSD after epidural anaesthesia in a patient with ductal stenosis. (10) In this patient's case, there was no ongoing anticoagulant treatment or blood crase disorder.

The pathogenesis of spinal hematomas remains largely unknown.(5) Little is known about the pathophysiology of spinal subdural hematomas outside coagulopathy. However, an analysis of the pathophysiology of non-traumatic cerebral HSD could help to deduce the mechanisms that explain spinal subdural hematoma following lumbar puncture.(2) For most authors, the factor that favors cerebral subdural bleeding outside the context of trauma and coagulopathy is primary or acquired hypotension (cerebrospinal fluid (CSF) diversion, lumbar puncture, dehydration). The consequence of the latter is traction on the cortico-dural veins, leading to rupture, particularly at the level of their attachment to the dura mater (Fig5).(11-14) In this patient's case, the hypotension theory could explain the occurrence of HSD. The two lumbar punctures would have led to a significant depletion of CSF, which in turn would have caused the hypotension, resulting in the rupture of the subdural veins at the level of their attachment to the dura mater. Another hypothesis that may explain the occurrence of subdural hematoma following lumbar puncture is direct injury to the subdural veins by the puncture needle. In this case, repeated damage to the subdural veins during the attempts would be the cause of the bleeding.

#### ➤ *Clinical appearance*

Subdural hematomas rarely cause significant compression and account for 16% of all spinal hematomas. The first case was described by Potts in 1910.(15) The

typical clinical picture reported by the majority of studies is the sudden onset of "stabbing" spinal or radicular pain at the level of compression, followed in some cases by a painless interval of minutes to days, and then the progressive onset of a neurological deficit below the affected spinal level. (16) In the case reported in this article, the patient presented with dagger-like pain during lumbar puncture, followed within 48 hours by vesico-sphincter disturbances, abolition of erection, and saddle anesthesia. Rare cases of combined spinal and cerebral subdural hematoma have been reported(5).

#### ➤ *Imaging aspect*

Magnetic resonance imaging (MRI) is the examination of the first choice.(3,4,17) It can be used to localize the hematoma and determine its extent, as well as to detect underlying lesions (vascular malformation, spinal cord tumor, etc.).(4,6) If MRI is not immediately available, a myelogram or CT scan can help diagnose the compression.(16) MRI was used to make the diagnosis in the case reported in this article. Among the available sequences performed by the radiologist, the STIR sequence highlighted the presence of the hematoma opposite S1 and S2. The presence of epidural fat allowed us to conclude that the hematoma was intradural. No vascular malformation was detected(4).

#### ➤ *Therapeutic aspects*

HSD can be managed surgically or medically conservatively. Conservative treatment is possible when there is no neurological deficit(17-19): for patients on coumarin anticoagulants, phytonadione (vitamin K1) 2.5 to 10 mg is administered subcutaneously, along with fresh frozen plasma until the INR (international normalized ratio) is normalized. Patients with thrombocytopenia receive platelets. In the event of clinical deterioration or severe motor or sensory deficits, surgical evacuation is recommended. In this patient's case, it was a case of cauda equina syndrome with severe neurological deficits that prompted the decision to operate.(17) Spontaneous resolution has also been described.(6)

### IV. CONCLUSION

Subdural spinal hematoma is a rare but serious pathology, as it can be responsible for neurological deficits that are sometimes permanent, although rarely very compressive.(15) It often occurs in subjects on anticoagulants or with coagulopathy, although cases without an obvious cause have been reported, as in this patient's case.(3) Management is medical-surgical.(6) Surgery is indicated in the presence of neurological deficits to increase the chances of recovery.(17)



Figure 1: MRI in STIR showing the hematoma

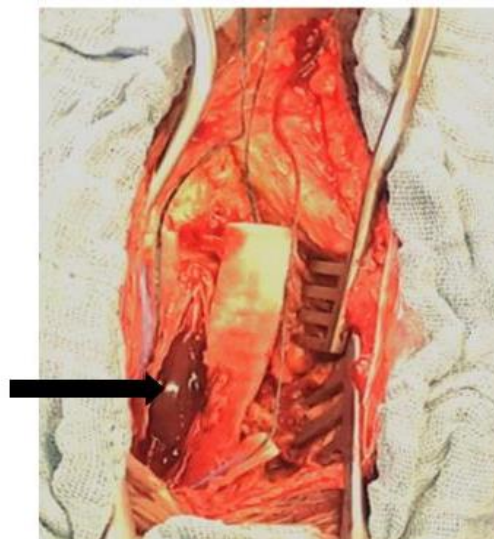


Figure 2: Hematoma exposure

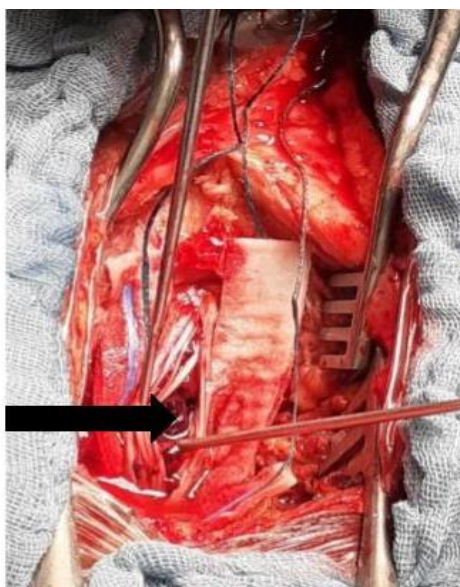


Figure 3: Exposure of the anterior portion of the hematoma

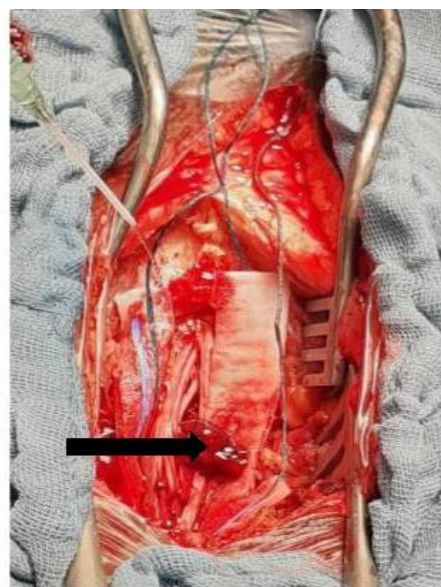


Figure 4: Evacuation of the anterior portion



Figure 5: Rupture point of the cortico-dural veins in cranial HSD

Tear of the cortico-dural veins in the subdural space at their fixation point



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**Conflict(s) of Interest:** No conflicts of interest.

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