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A case of acute spinal intradural hematoma due to spinal anesthesia

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ABSTRACT

Spinal intradural hematoma is a rare complication of diagnostic lumbar puncture or spinal anesthesia. This complication could be overlooked with devastating neurological consequences due to a delay in diagnosis. Here, we reported a case of a patient with a lumbar spinal intradural hematoma as a result of a difficult spinal anesthesia.

1. Introduction

Non-traumatic spinal intradural (subdural and subarachnoid) hematoma (SIH) has been reported in the setting of lumbar spinal punctures, myelography and spinal anesthesia^[1]. The clinical manifestation includes neurological deficits involving the cauda equina. Some underlying medical conditions are usually encountered in patients affected by this complication such as hematological malignancies, bleeding disorders or therapeutic anticoagulation^[2,3]. Here, we reported a case of a delayed manifestation of a SIH after a difficult spinal anesthesia. We also highlighted the importance of an early diagnosis in order to decompress the cauda equina as soon as possible minimizing neurological impairment.

2. Case report

This 79-year-old patient with systemic lupus erythematosus underwent left hip replacement under a particularly difficult

spinal anesthesia. Three days later, during ambulation, the patient complained of a severe acute low back pain with irradiation to lower limbs. The patient was managed with analgesia and bed rest, and prophylactic anticoagulation was also prescribed. Two days later, the patient began to present loss of strength in feet, perineal “saddle” hypoesthesia, urinary incontinence and severe constipation. Neurological examination showed motor strength of 0/5 in bilateral foot flexion and extension, with 4/5 in legs and thighs. The patellar and the ankle jerk reflexes were absent. On sensory testing, the patient had a decreased sensation to pinprick below L5 level with an intact function of the anal sphincter. A lumbar magnetic resonance image (MRI) demonstrated mixed signal intensity in the cauda equina due to an L1-L3 subdural and subarachnoid hematoma in different stages associated with severe degenerative changes in the lumbar spine. The patient underwent immediately L1-L3 laminectomy; an acute subdural hematoma was found and evacuated. In the subarachnoid space, a fibrous blood clot was found at the L3 level and a fresh clot was found at the L1 level (Figure 1).

We found these clots sharply demarcated between the subarachnoid membranes and the neural tissue of the cauda equina. The clot was carefully dissected and was pulled away from the cauda equina in order to avoid manipulation of the nerve roots. The hematoma was finally evacuated from the exposed spinal

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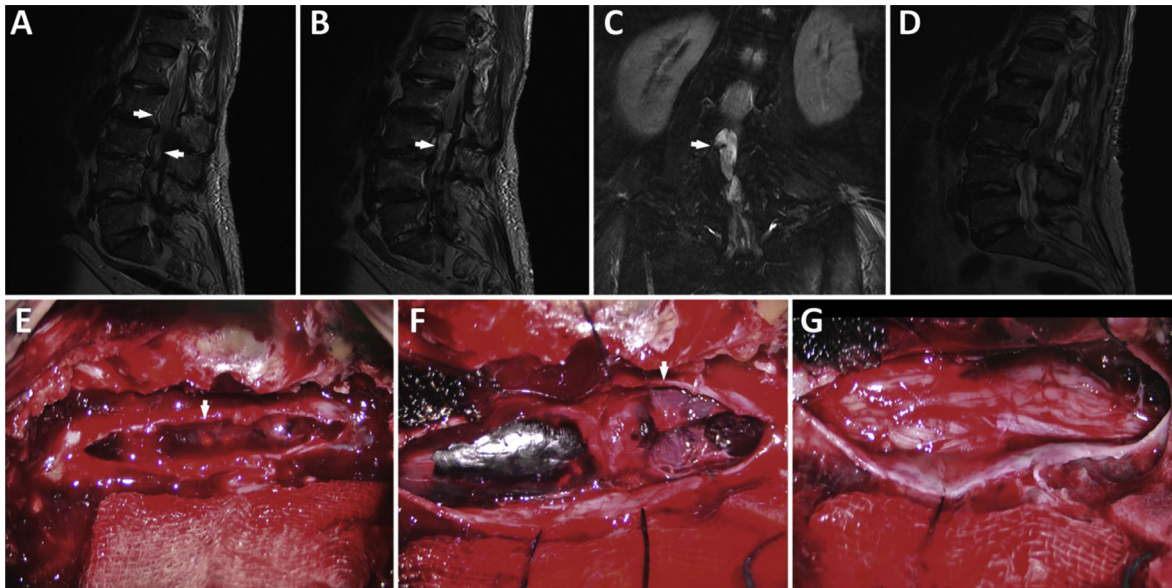


Figure 1. Patient with L1-L3 SIH.

A: Lumbar MRI (T2 weighted image) showed heterogeneous signal intensity with isointense lesions at the L2 level and hyperintense lesions at the level of L3 showed also in B and C; D: Postoperative lumbar MRI showed complete evacuation of the SIH; E: Intraoperative photograph showed three-level laminectomy and the aspect of the subdural part of the hematoma; F: Intraoperative photograph showed the subarachnoid portion of the hematoma, the arrow shows the fibrous clot compressing the nerve roots; G: Intraoperative photograph showed the decompressed nerve roots.

levels. In the immediate postoperative period, there was no complications related to the procedure and no worsening in the neurological function. The patient recovered the bladder and bowel function and also showed a slight improvement in feet strength, but unable to walk without assistance. Histopathological analysis of the specimen showed an organized clot with no nervous or dural tissue. Postoperative lumbar MRI showed complete evacuation of the clots.

3. Discussion

SIH is a very rare complication of the spinal anesthesia and diagnostic procedures such as myelography and lumbar puncture^[4]. Some authors stated that spinal anesthesia could give rise to SIH in the presence of coagulopathy^[2]. Furthermore, it has been reported that SIH is most likely to occur in technically difficult spinal anesthesia^[4]. Spinal stenosis, or other degenerative changes in the spine, has been found to be a predisposing factor for iatrogenic SIH due to the obstructed cerebrospinal fluid circulation and with the subsequent difficulty to wash out the active bleeding^[1,2]. However, these are not *sine qua non* conditions because SIH has been also reported in young patients without coagulopathy and with uneventful spinal anesthesia^[5,6]. Although, one of the main associated factors of this complication is coagulopathy^[1], some reports suggested that systemic lupus erythematosus could be also associated with hematomas at different sites on the neuraxis^[7]. The source of bleeding usually comes from the iatrogenic puncture of radicular vessels in the subarachnoid space and it has been speculated that the pass of the blood to the subdural space is usually through lacerations in the arachnoid due to the intradural punctures^[4].

Clinical manifestation is usually delayed 2–4 days after the trigger event^[4]. Our patient developed the full clinical picture after 5 days of the procedure. A spinal MRI is the choice for diagnosis test and epidural hematoma is the main differential diagnosis of SIH, specially when there are significant

degenerative changes distorting the anatomy of the intraspinal compartments^[8]. Epidural bleeding has been described as a homogeneous lesion that is most frequently located posterior to the dural sac in the lumbar spinal levels. The MRI findings of intradural bleeding are usually described as heterogeneous signal intensities due to the age of the hematoma given that this complication is usually diagnosed many days after the trigger event. In our case, 5 days later of the spinal anesthesia, the lumbar MRI showed isointense lesions at L1-L2 levels (acute) and hyperintense lesions at L3 level (late subacute) on T2 weighted images. T1 weighted image showed isointense signal in the whole extent of the diseased levels.

In patients with SIH and severe neurological symptoms such as paresis or sphincter dysfunction, surgical decompression should be carried out. However, there are some patients who have no significant clot burden and have mild neurological symptoms or pain. These cases could be successfully treated with conservative management^[5,6]. Laminectomy followed by opening of the dura and resection of the clots is usually the surgical strategy performed. Cauda equina should be carefully protected and generous irrigation should be done to wash out any little clot embedded in the nerve roots. In our patient, the surgical findings were consistent with a fibrous evolution of the clot located at L3 spinal level and a fresh blood clot at L1-L2 levels (Figure 1). The surgical dissection plane was difficult to find at the lower levels due to the adherence of the fibrous tissue with the cauda equina. Surgical technique was carried out with careful dissection of the clot covering the nerve roots. Gentle traction of the hematoma, while the nerve roots are identified and protected, is usually the way to separate it from the cauda equina^[9].

The outcome of the SIH will depend on the neurological status prior to the evacuation of the hematoma^[10–12]. Therefore, when the diagnosis is overlooked, or the clinical presentation is delayed, a significant neurological impairment is unavoidable^[11]. In summary, SIH should be suspected in patients complaining of acute symptoms of radiculopathy after a technically difficult

invasive procedure involving the lumbar spine. Predisposing factors should be identified and prompt diagnostic workup should be initiated prior to the development of severe neurological impairment^[13].

Conflict of interest statement

The authors report no conflict of interest.

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