

IMAGE IN ER

The Iatrogenic Multi Spaces, Spinal Hemorrhage after Lumbar Puncture

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INTRODUCTION

A very rare complication following a lumbar puncture is creation of an iatrogenic multi-space, leading to spinal hemorrhage in either the epidural, subdural or subarachnoid spaces.

Today we report a case of iatrogenic multi spacing following a failed lumbar puncture to obtain a CT Myelogram. This case is important as multiple attempts of lumbar puncture, whether to obtain a spinal tap or CT Myelogram, could lead to complications such as the ones our patient faced. Improper lumbar puncture could lead to spinal hemorrhage. ⁽¹⁾

CASE PRESENTATION

This is a case of a 53-year-old male with a prior posterior lumbar interbody fusion at the L3-4 level. He had a spinal rod and pedicle screws placement procedure on December 13th, 2018. Following the surgery, the patient had a Staphylococcus infection and had another surgery on the 28th of December

2018. This was followed by intravenous and oral antibiotics. A repeat MRI exam was performed on the 14th of March 2019 which showed no residual infection. The patient returned with a complaint of back pain on October 7th, 2019 and a CT Myelogram was ordered. Unsuccessful lumbar puncture for CT Myelogram was attempted 6 times and the patient was discharged home.

The patient presented again to the emergency department on the 13th of October 2019, this time complaining of lower back pain which radiated to both legs as well as superiorly into the neck and head. An MRI of the lumbar spine was performed on the same day which demonstrated tricompartamental hemorrhage extending from the imaged T11 to the sacrum.

The MRI demonstrated both high and low intensity on both T1 and T2 signals in the epidural, subdural, and subarachnoid hem-

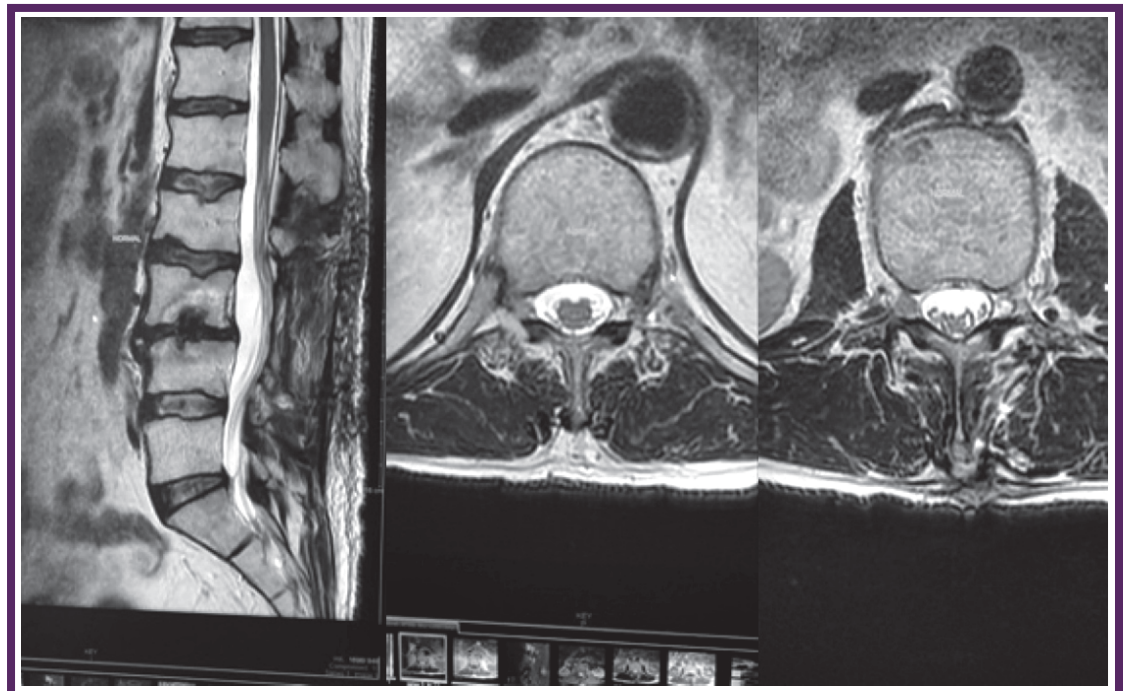


Figure 1: Normal radiographs of the spinal cord in both sagittal and transverse planes

orrhage. This hemorrhage has caused the posterior displacement of the conus medullaris and cauda equina.

DISCUSSION

Our patient had a spinal hemorrhage as proven by the



Figure 2: Radiograph of the patient, showing a displaced Cauda Equina

MRI. His hemorrhage was present in all three compartments, namely the epidural, subdural and subarachnoid spaces.

A spinal hemorrhage can be in either epidural, subdural, or intrathecal (subarachnoid) spaces. Hemorrhage leads to the presence of deoxyhemoglobin, which depicts as a discrete area of low intensity on a T2 signal. ⁽²⁾

Common causes for a spinal hemorrhage include any sort of coagulopathy, whether genetic or due to anticoagulation therapy. Iatrogenic causes can also lead to a spinal hemorrhage,⁽³⁾ for example, after a procedure such as the lumbar puncture done in the patient. A spinal hemorrhage could follow any sort of trauma to the spinal area as well.

Intrathecal or subarachnoid hemorrhages are rare because the normal clotting mechanism is hindered by dilution of blood by cerebrospinal fluid present in this space as well as defibrination, which is the removal or depletion of fibrinogen, an important factor in blood clotting, caused by a normal pulsation.

The iatrogenic hemorrhage occurs most often due to the rupturing of the radicular arteries and veins by repeated trauma often caused by a failed lumbar puncture. Depending on the position of the hemorrhage, the symptoms of this condition vary. If the hemorrhage is present in a relatively central position within the thecal sac, it usually presents with acute back pain, whereas a more dorsally aligned hemorrhage leads to posterior displacement of the cord or cauda equina as well as significant neurological deficits along with pain.

The golden standard method for diagnosis of hemorrhage is MRI.⁽⁴⁾

Treatment of this condition is surgical decompression if the patient is experiencing neurological deficits. Otherwise conservative medical management with steroids is recommended. Spontaneous spinal epidural hematoma, a similar condition is treated by a laminectomy or surgical decompression.⁽⁵⁾ This involves removing the lamina on the posterior side of the vertebra to create space for the spinal cord.

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