Case Report

Successful lumbar puncture with Taylor's approach for the diagnostic workup of meningitis in a patient with Ankylosing spondylitis

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Abstract

Meningitis and encephalitis are the neurological emergencies. As the clinical findings lack specificity, once suspected, cerebrospinal fluid (CSF) analysis should be performed and parenteral antimicrobials should be administered without delay. Lumbar puncture can be technically challenging in patients with ankylosing spondylitis due to ossification of ligaments and obliteration of interspinous spaces. Here, we present a case of ankylosing spondylitis where attempts for lumbar puncture by conventional approach failed. CSF sample was successfully obtained by Taylor's approach.

Keywords: Ankylosing spondylitis, difficult lumbar puncture, meningitis, Taylor's approach

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Introduction

Meningitis and encephalitis are potentially life threatening central nervous system diseases. The challenge in diagnosis is that there is no single definitive clinical symptoms or signs.[1] Initial treatment approach to the patients with suspected acute bacterial meningitis depends on rapid diagnostic evaluation and emergent antimicrobial and adjunctive therapy. Once there is a suspicion, lumbar puncture should be performed immediately to determine whether the cerebrospinal fluid (CSF) findings are consistent with clinical diagnosis.[2]

Ankylosing spondylitis is a complex, potentially debilitating disease that is insidious in onset and progressing to radiological sacroiliitis over several years. In advanced stage of disease, there is ascending involvement of spine. The affected tissue is gradually replaced by fibrocartilage and then becomes ossified.[3] In 1940, Taylor described a modified para-median lumbosacral approach through the L5-S1 space.[4] The L5-S1 space is least likely to be obliterated by pathological processes such as degeneration and excessive scarring.

Here we present a known case of ankylosing spondyliits with suspected acute bacterial meningitis. Lumbar puncture was successfully performed with Taylor's approach after it failed with the conventional approach.

Case Report

A 42-year-old gentleman, weighing around 50 kg, presented with the history of headache, fever (up to 102° F), and altered level of consciousness of 1-day duration. On

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examination, he was confused and neck stiffness was present. There were no focal neurological deficits and papilloedema was absent. On laboratory investigation, he had leucocytosis of 13,400/cu mm with 92% neutrophils. Serum blood sugar was normal. Computed tomography scan of the head was normal. He was febrile and tachycardic. With the suspicion of bacterial meningitis, empiric antibiotic therapy with ceftriaxone 2 g was initiated immediately. Dexamethasone 7.5 mg was administered together with the first dose of antibiotic.

The patient was a diagnosed case of ankylosing spondylitis. Recent radiograph of lumbosacral spine revealed bilateral sacroiliitis, calcification of anterior and posterior longitudinal ligaments with syndesmophytes and bamboo spine [Figure 1]. Local examination of lumbar spine revealed loss of lumbar lordosis [Figure 2]. Multiple attempts for lumbar puncture in left lateral position at various levels (L2-3 and L3-4), with both midline and para-median approach were carried out by experienced anesthesiologists, but it failed. After eight failed attempts, lumbar puncture was successfully performed with the Taylor's approach. After infiltration with local anesthetic agent, 25 gauge Quincke spinal needle was inserted at a point 1 cm medial and 1 cm caudal to the lowest prominence of posterior superior iliac spine, located immediately anterior to skin dimple [Figure 2]. The needle was directed in a cephalo-medial direction towards the L5-S1 space and turbid CSF was obtained in first attempt. CSF sample was obtained around 3 h after starting the empirical antimicrobial therapy. CSF analysis was highly suggestive of bacterial meningitis and the culture report revealed *Streptococcus pneumoniae*. Ceftriaxone was administered 2 g 12 hourly for 14 days and dexamethasone was continued 6 hourly for 4 days at the dose of 7.5 mg. Patient recovered completely with no residual neurological deficits.

Discussion

Acute meningitis is a medical emergency with a potential for high morbidity and mortality. The outcome of the patients is improved by prompt antibiotics treatment. Delay in antibiotic therapy correlates independently to unfavorable outcome. The odds for unfavorable outcome may increase by up to 30% per h of treatment delay.[5] The clinical findings of meningitis lack specificity. So, the key to diagnosis of meningitis is evaluation of CSF.[6] After administration of antibiotics, the chance of positive CSF culture decreases with time, but is likely to be positive within 4 h.[7]

Ankylosing spondylitis is a chronic rheumatic disease causing chronic inflammation, bone destruction and aberrant bone repair. In the late stage of disease, there is restriction of spinal mobility and fusion of spine.[3] Classic joint involvements include bilateral sacroiliac, thoracolumbar and lumbosacral joints. Lumbar puncture is technically challenging in these patients due to reduced articular mobility of spine, obliteration of interspinous spaces, midline ossification of interspinous ligament and difficulty in proper patient positioning.[8] Taylor's approach can provide a reliable alternative to midline approach for lumbar puncture by targeting the L5-S1 interlaminar space, which is the lowest and widest available space, which is least affected by arthritic and degenerative changes.[9]

Use of ultrasound for lumbar puncture has been shown to reduce the risk of failure as well as the number

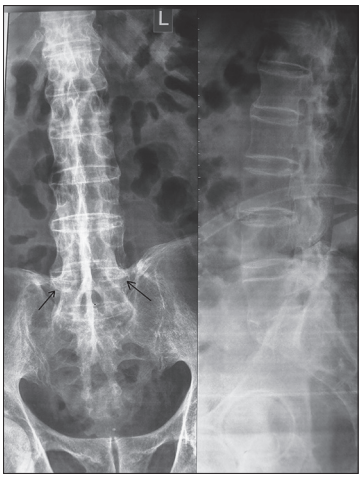

Figure 1: X-ray of lumbosacral spine showing bilateral sacroiliitis, calcification of anterior and posterior longitudinal ligaments with syndesmophytes and bamboo spine. Needle insertion point and direction is marked by black arrows

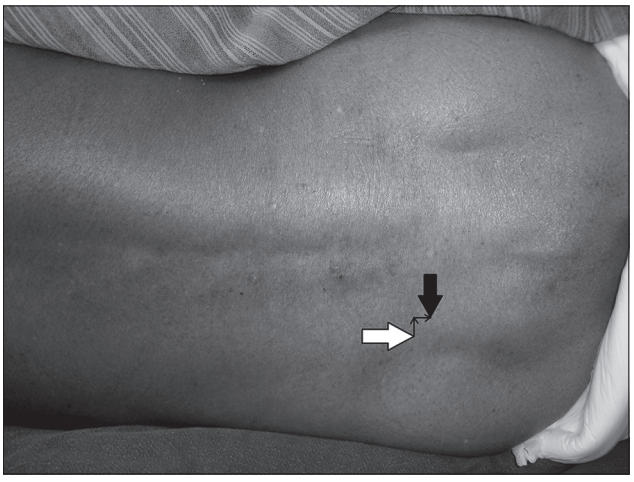

Figure 2: Patient lying in left lateral position showing loss of lumbar lordosis. Posterior superior iliac spine is marked by white arrow and the site of skin puncture for lumbar puncture by Taylor's apporach is marked by black arrow. The medial and caudal direction is marked by thin black lines

of needle insertions and redirections.[10] Ultrasound guidance has been shown to be useful in obstetric and nonobstetric population with difficult surface anatomic landmarks.[11,12] However, it is operator dependent and is not routinely available in all places. In our case, ultrasound was not used, because of unavailabilty. Fluoroscopy guidance for lumbar puncture may be helpful in patients with severe bony abnormalities.[13]

Conclusion

Lumbar puncture with Taylor's approach can be helpful for obtaining CSF sample for diagnostic evaluation in patients with deformity of spine, when conventional technique for lumbar puncture fails.

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Conflicts of interest

There are no conflicts of interest.

References

1. Gaieski DF, Nathan BR, Weingart SD, Smith WS. Emergency neurologic life support: Meningitis and encephalitis. Neurocrit Care 2012;17 Suppl 1:S66-72.
2. Tunkel AR, Hartman BJ, Kaplan SL, Kaufman BA, Roos KL, Scheld WM, *et al.* Practice guidelines for the management of bacterial meningitis. Clin Infect Dis 2004;39:1267-84.
3. Sieper J, Braun J, Rudwaleit M, Boonen A, Zink A. Ankylosing spondylitis: An overview. Ann Rheum Dis 2002;61 Suppl 3:iii8-18.
4. Taylor JA. Lumbosacral subarachnoid tap. J Urol 1940;43:561-4.
5. Køster-Rasmussen R, Korshin A, Meyer CN. Antibiotic treatment delay and outcome in acute bacterial meningitis. J Infect 2008;57:449-54.
6. Straus SE, Thorpe KE, Holroyd-Leduc J. How do I perform a lumbar puncture and analyze the results to diagnose bacterial meningitis? JAMA 2006;296:2012-22.
7. Michael B, Menezes BF, Cunniffe J, Miller A, Kneen R, Francis G, *et al.* Effect of delayed lumbar punctures on the diagnosis of acute bacterial meningitis in adults. Emerg Med J 2010;27:433-8.
8. Jindal P, Chopra G, Chaudhary A, Rizvi AA, Sharma JP. Taylor's approach in an ankylosing spondylitis patient posted for percutaneous nephrolithotomy: A challenge for anaesthesiologists. Saudi J Anaesth 2009;3:87-90.
9. Gupta K, Rastogi B, Gupta PK, Rastogi A, Jain M, Singh VP. Subarachnoid block with Taylor's approach for surgery of lower half of the body and lower limbs: A clinical teaching study. Anesth Essays Res 2012;6:38-41.
10. Shaikh F, Brzezinski J, Alexander S, Arzola C, Carvalho JC, Beyene J, *et al.* Ultrasound imaging for lumbar punctures and epidural catheterisations: Systematic review and meta-analysis. BMJ 2013;346:f1720.
11. Schnabel A, Schuster F, Ermert T, Eberhart LH, Metterlein T, Kranke P. Ultrasound guidance for neuraxial analgesia and anesthesia in obstetrics: A quantitative systematic review. Ultraschall Med 2012;33:E132-7.
12. Chin KJ, Perlas A, Chan V, Brown-Shreves D, Koshkin A, Vaishnav V. Ultrasound imaging facilitates spinal anesthesia in adults with difficult surface anatomic landmarks. Anesthesiology 2011;115:94-101.
13. Gondhule R, Madhusudan S, Sriganesh K. Fluoroscopic-guided lumbar puncture in severe kyhoscoliosis: An alternative option in a difficult scenario. J Neuroanesthesiol Crit Care 2014;1:70-1.