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Intramedullary Lesion- Aspetic subdural pyogenic abscess in dorsolumbar spinal cord with conus medularis cystic lesion with syringomyelitis: A Case Report

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Abstract

Spinal subdural abscess/empyema is uncommon but serious condition with significant morbidity and mortality. Till date very few cases of spinal subdural abscess has been reported. Prognosis of Spinal Subdural Abscess is highly dependent on the timeliness of its diagnosis before neurological deficits develop. Risk factors, presenting symptoms, and characteristic findings on magnetic resonance imaging (MRI) findings should be properly considered and thoroughly evaluated. Symptoms include fever, back pain, and neurological symptoms, but this collection of symptoms is seen in only about 10% of cases. However, most patients complain of severe localized lower back pain. Gadolinium-enhanced MRI is the most sensitive, specific, and beneficial imaging modality for establishing a diagnosis. While hematogenous spread of an extra-spinal infection is the most common cause of this condition, a significant number of cases result from iatrogenic mechanisms, including lumbar punctures, epidural injections, and surgery. In few cases there may be no organism isolated as in our case, possible reason being prior usage of antibiotics before surgery. Treatment should include prompt surgical exploration and decompression combined with appropriate prolonged antibiotic treatment with regular follow up and physiotherapy.

Keywords: Subdural abscess, spinal cord abscess, Empyema, Syringomyelitis, Tuberculosis of spine, Sub arachnoid abscess, Meningitis, Paraplegia, dorsolumbar spine abscess, Dural CSF leak

1. Introduction

Subdural pyogenic abscess is a rare, life-threatening, purulent collection of material between the outer duramater and inner arachnoid mater^[1]. Although operative cultures can identify the causative organisms, 7%–52% of cases yield no growth, which is largely attributed to the prior use of antibiotics or improper use of anaerobic culture techniques^[3]. Most patients with spinal subdural abscess have one or more predisposing conditions^[1, 3, 21], such as an underlying disease which diminishes resistance of the patient to infection (diabetes mellitus, alcoholism, tumours or infection with human immunodeficiency virus), anatomical abnormalities of the spinal cord or vertebral column or intervention^[17, 22] (degenerative joint disease, trauma, surgery, drug injection, placement of catheters or stimulators). The development of spinal subdural abscess could be secondary to hematogenous spread of infection from another region^[23], infected CSF and direct spread into the subdural space^[24], hematogenous inoculation during the course of meningitis^[24], secondary inoculation due to lumbar puncture, direct contact with intraspinal space (osteomyelitis) and secondary infection after spinal surgery^[24–26]. Back pain at the level of the affected spine, fever and neurologic deficits such as para/Quadriplegia, bladder dysfunction, disturbances of consciousness and inflammatory signs are some typical symptoms of spinal subdural abscess^[3, 4, 20]. An established staging system for abscesses outlines the progression of symptoms and physical findings: stage 1, fever with or without spinal or nerve root pain; stage 2, mild neurological deficits are added to the clinical picture; stage 3, paralysis and complete sensory loss occur below the level of the lesion^[27]. The most common causative agent is *Staphylococcus aureus* and some predisposing factors are alcoholism, diabetes mellitus, immunosuppressive drugs,

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malignant tumour, chronic renal failure, intravenous drug abuse, rheumatic heart valve disease and tuberculosis. The patient may reveal involvement of the central neural system which may result a poor outcome.

MRI, myelo CT, and computerized tomography (CT) are the most common diagnostic modalities. Contrast – enhanced MRI is the imaging method of choice because it is less invasive and due to its superiority in sensitivity in detecting the exact location and extension of the abscess which is essential for planning surgery [1, 3, 5]. MRI is also the modality of choice for diagnosing compressive myelopathy [28].

Leukocyte count, erythrocyte sedimentation rate (ESR) and C- reactive protein, although usually are found elevated, are not sensitive indicators of spinal infections [17, 29, 30]. Patient may have leukocytosis with a left shift and elevated C – reactive protein.

Subdural pyogenic abscess can lead to complications like neurological deficits such as paraparesis in our case due to its location in dorsolumbar spine. Other complications depending upon its location are seizures, cerebral venous thrombosis, hydrocephalus, cerebral swelling, coma and eventually death [1]. Diagnosis is made with radiographic imaging including CT scan and, more sensitive, MRI [1, 3]. Treatment requires a prolonged course of antibiotics and immediate surgical evacuation [3]. These measures have led to reduced morbidity and mortality [1]. Early recognition and rapid antibiotics and surgical intervention can reduce the morbidity and mortality of Subdural pyogenic abscess. Hematogenous spread of infection from a distant source often takes place. In a surprising number of incidences, iatrogenic causes are the

primary foci of spinal subdural abscess. Spinal subdural abscess is an unpredictable disease, with an unfavourable outcome if left untreated. If there is suspicion of a spinal subdural abscess, urgent radiological examination followed by immediate surgical drainage and appropriate antibiotic therapy is warranted.

Clinical diagnosis

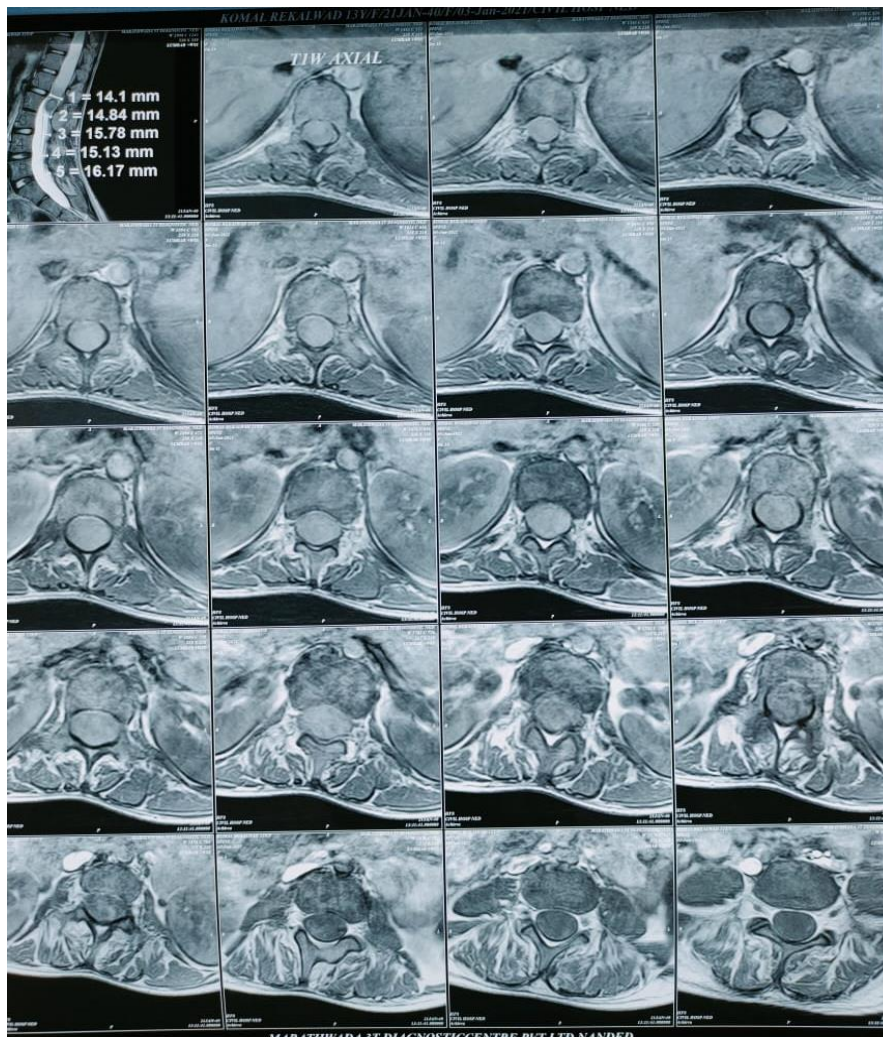
A 12 years old female child brought to outpatient department at our institute with complains of pain in lower back and weakness in both lower limb following self-fall since 10 days. On clinical examination there was mild swelling and tenderness over lumbar region with weakness in both lower limb and absent sensation below L2 with bowel and bladder involvement. Patients routine blood investigation was done and showed raised TLC count. Xray of LS spine showed reduced disc space between L2-L3 vertebrae. CT LS Spine - S/O intramedullary calcified lesion in conus medularis at L1-L2 vertebral levels with distended subarachnoid space.

CT myelography was done which showed Long segmental intramedullary solid cystic lesion with calcified solid component involving conus medularis extending from T10-L2 vertebrae level causing widening of spinal cord and distal obstruction with resultant distended subarachnoid space from L2-S1 level and posterior vertebral scalloping.

MRI Whole spine showed Large T2 bright and T1 intensity signal lesion in spinal cord not seen separate from spinal cord with level D10 to L3 occupying whole spinal cord. At inferior end of above lesion, solid soft tissue intensity not seen separate from conus medularis with mild syringomyelitis.



Pic 3: Saggital view MRI images of spine



Pic 4: Transverse view MRI images of spine

Differential diagnosis

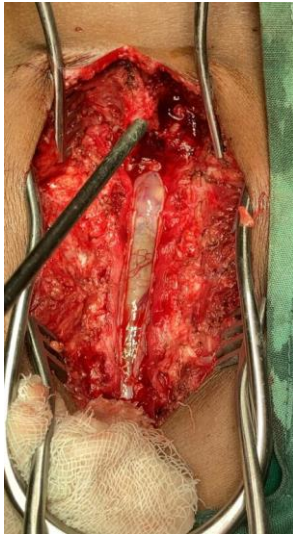
1. Spinal tumour syndrome
2. Meningitis
3. Potts spine
4. Purulent meningitis
5. Spinal cord abscess
6. Subdural or subarachnoid haemorrhage
7. Cerebrospinal fluid leak
8. Disc herniation
9. Synovial cyst
10. Intra- or extradural tumour

Discussion of management

Surgical drainage together with systemic antibiotics is the treatment of choice ^[1,2]. Without intervention, stage 3 symptoms would develop and surgery performed after this stage may not reverse the neurological deficits. Laminectomy, sometimes in more than one level depending of the extension of the abscess, could be necessary. When laminectomy in more than three levels is necessary this could result in spinal

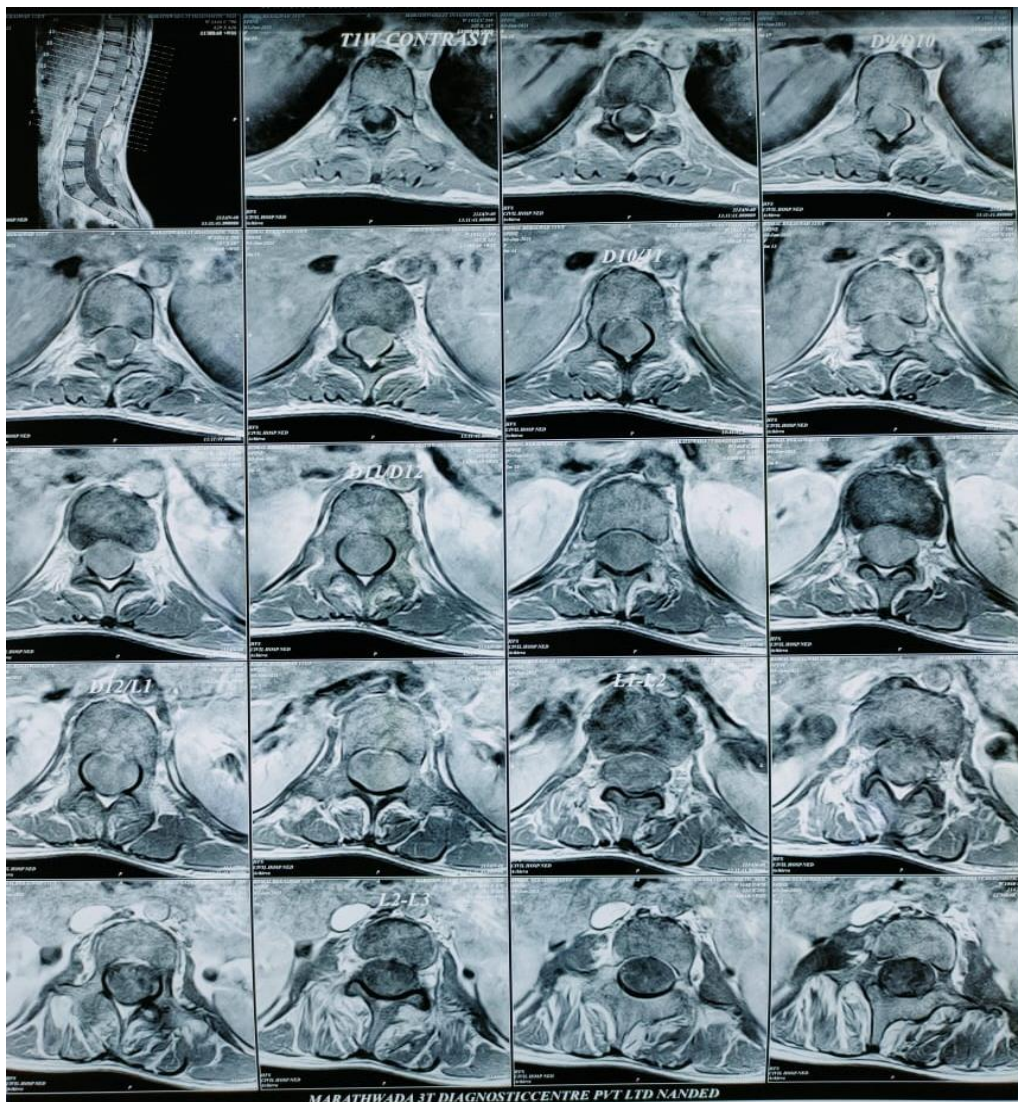
instability ^[1,31]. Because the rate of progression of neurologic impairment is difficult to predict and some patients may become paralyzed within hours after the onset of neurologic deficit, laminectomy, evacuation of the pus-like material and debridement of infected tissues should be done as soon as possible ^[1,3]. Outflow or inflow/outflow drainage systems could be used and be very useful. In cases of wider spread a single laminectomy in several different levels could be performed. Postoperatively a second spinal MRI should be conducted.

Our patient was evaluated thoroughly and planned for excision of mass. After all necessary blood investigation, physician fitness and anaesthesia fitness, patient was posted for surgery. Patient underwent Laminectomy with decompression. After incision and soft tissue dissection, laminectomy done, lesion exposed. Vertical incision taken over lesion and frank pus, thick and dark yellowish to grey in color seen. Sample taken for various microbiological and pathological investigation. After thorough wash, drain inserted and closure in layers was done.

**Pic 1:** Before dura incision**Pic 2:** After dura incision

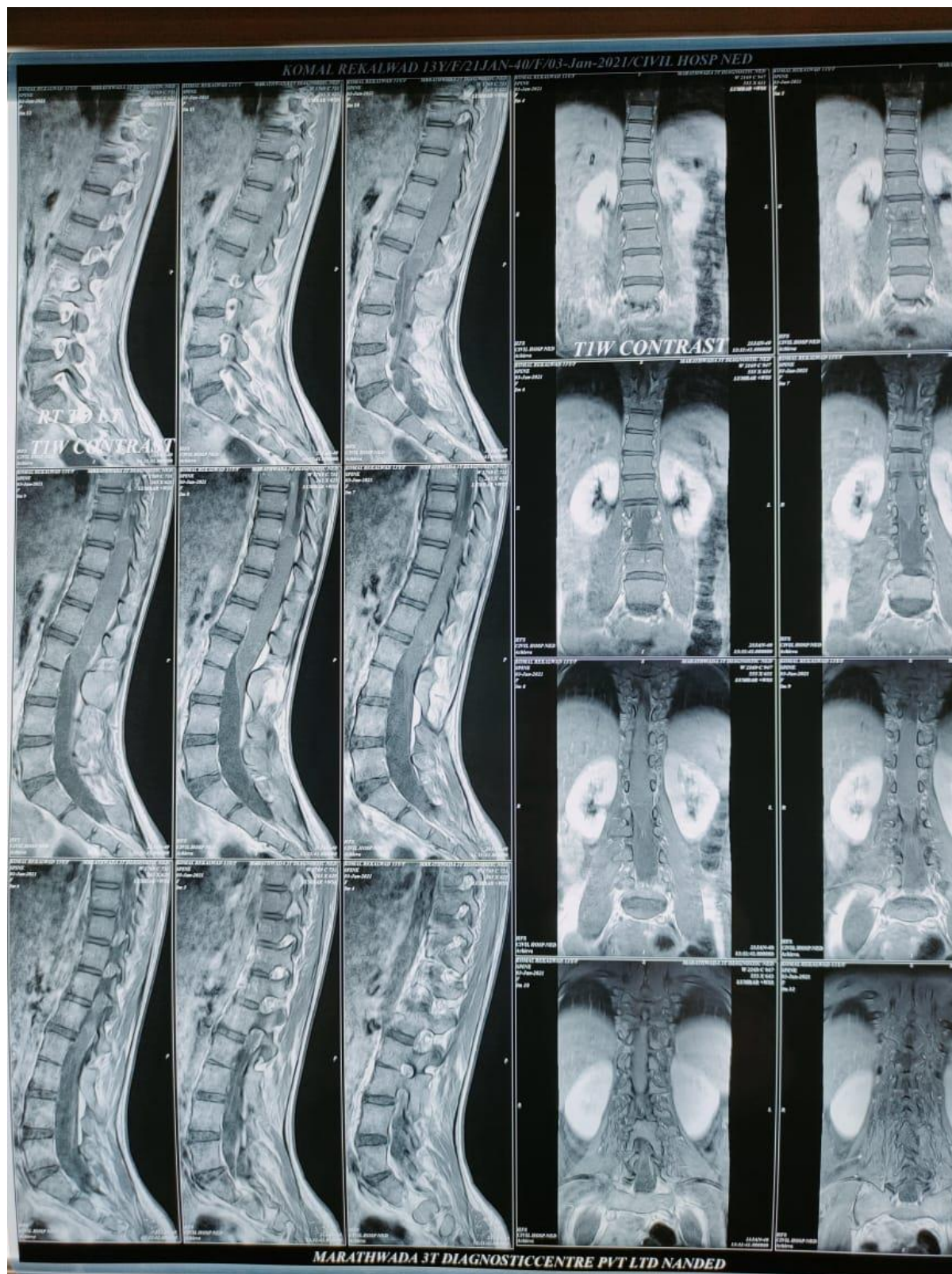
Post operatively, patient's neurological status deteriorated for first 2 weeks and patient had complain of persistent straw coloured discharge from the suture site and was suspected for Dura-leak. For this, patient was posted again for re-suturing of duramater layer and dressing done. Discharge from suture site stopped and patient sure line became healthy. Sample collected intra-op investigation report revealed no organism detected and no acid fast bacilli in gram stain, ZN

stain, Pus culture and sensitivity. Gene Xpert for Tb came negative. Patient diagnosed to have Subdural Pyogenic abscess. Patient is showing improvement in neurological status of both lower limb and was discharged with advice of regular follow up, physiotherapy and medication. During follow up patient is showing improvement in neurological status with complete healing of surgical scar and bedsore over sacral area.

**Pic 5:** Transverse view MRI films of dorsolumbar spine



Pic 6: Sagittal view of MRI whole spine



Pic 7: Saggital and coronal view of MRI spine

Consent

Written informed consent was obtained from the patient relative for publication of this case report and MRI images. A copy of the written consent is available from the editor-in-chief of the journal.

References

1. Vural M, Arslantaş A, Adapınar B, Kiremitççi A, Usluer G, Cuong B *et al*. Spinal subdural Staphylococcus aureus abscess: case report and review of the literature. *Acta Neurol Scand* 2005;112:343-346. 10.1111/j.1600-0404.2005.00496.x. Article CAS PubMed Google Scholar
2. Bartels RH, Rob De Jong T, Grotenhuis JA. Spinal subdural abscess. *J Neurosurg* 1992;76:307-11. 10.3171/jns.1992.76.2.0307. Article CAS PubMed Google Scholar
3. Lange M, Tiecks F, Schielke E, Yousry T, Haberl R, Oeckler R. Diagnosis and results of different regimes in patients with spinal abscesses. *Acta Neurochir (Wien)*

- 1993;125:105-14. 10.1007/BF01401836. Article CAS Google Scholar
4. Chen CY, Lin KL, Wang HS, Lui TN. Dermoid cyst with dermal sinus tract complicated with spinal subdural abscess. *Pediatr Neurol* 1999;20:157-60. 10.1016/S0887-8994(98)00126-X. Article CAS PubMed Google Scholar
5. Ozates M, Ozkan U, Kemaloglu S, Hosoglu S, Sari I. Spinal subdural tuberculous abscess. *Spinal Cord* 2000;38:56-8. 10.1038/sj/sc/3100949. Article CAS PubMed Google Scholar
6. Chern SH, Wei CP, Hsieh RL, Wang JL. Methicillin-resistant *Staphylococcus aureus* retropharyngeal abscess complicated by a cervical spinal subdural empyema. *J Clin Neurosci* 2009;16:144-146. 10.1016/j.jocn.2008.03.013. Article PubMed Google Scholar
7. Ko MW, Osborne B, Jung S, Jacobs DA, Marcotte P, Galetta SL. Papilledema as a manifestation of a spinal subdural abscess. *J Neurol Sci* 2007;260:288-292. 10.1016/j.jns.2007.05.013. Article PubMed Google Scholar
8. Sorar M, Er U, Seckin H, Ozturk MH, Baybek M. Spinal subdural abscess: a rare cause of low back pain. *J Clin Neurosci*. 2008;15:292-294. 10.1016/j.jocn.2006.01.027. Article PubMed Google Scholar
9. Semlali S, Akjouj S, Chaouir S, Hanine A, Ben Ameer M. Spinal subdural tuberculous abscess in a patient with tuberculous meningitis. *J Radiol* 2007;88:280-281. 10.1016/S0221-0363(07)89816-7. Article CAS PubMed Google Scholar
10. Woo SP, Han YS, Hong KC, Sam SY, Hwan AY. Infantile Lumbosacral Spinal Subdural Abscess with Sacral Dermal Sinus Tract. *Spine* 2007;E32(1):E52-E55. Google Scholar
11. Poppucci A, De Bonis P, Sabatino G, Federico G, Moschini M, Anile C *et al.* Cranio-spinal subdural empyema due to *S. intermedius*: a case report. *J neuroimaging* 2007;17(4):358-60. Article Google Scholar
12. Al-Bar R, Chedid F, Casikar V. Acute paraplegia secondary to paraspinal abscess. *Saudi Med J* 2003;24:S57. Google Scholar
13. Alvarez Sastre, Villarejo C, Lopez F, Robledillo JC, Martin-Gamero AP, Perez Diaz C. Subdural empyema with extension to vertebral canal secondary to salmonellosis in a patient with systemic lupus erythematosus. *Child Nerv Syst* 2002;18:528-531. 10.1007/s00381-002-0618-8. Article Google Scholar
14. Baker RP, Brown EM, Coakham HB. Overwhelming cranial and spinal subdural empyema secondary infected sacral decubitus ulcers. *Br J Neurosurg* 2003;17:572-573. 10.1080/02688690310001626886. Article CAS Google Scholar
15. Chen MH, Chen MH, Huang JS. Cervical subdural empyema following acupuncture. *J Clin Neurosci* 2004;11:909-911. 10.1016/j.jocn.2004.02.011. Article PubMed Google Scholar
16. Schafer F, Mattle HP. Neurologic manifestations of *Staphylococcus aureus* infections: analysis of 43 patients. *Schweizer Archiv Fuer Neurologie und Psychiatrie* 1994;145:25-29. CAS Google Scholar
17. Thome C, Krauss JK, Zevgaridis D, Schmiedek P. Pyogenic abscess of the filum terminale. *J Neurosurg (Spine)* 2001;95:100-4. 10.3171/spi.2001.95.1.0100. Article CAS Google Scholar
18. Volk T, Hebecker R, Ruecker G, Perka C, Haas N, Spies C. Subdural empyema combined with paraspinal abscess after epidural catheter insertion. *Anesth Analg* 2005;100:1222-3. 10.1213/01.ANE.0000149040.54969.B4. Article CAS PubMed Google Scholar
19. Wu AS, Griebel RW, Meguro K, Fourney DR. Spinal subdural empyema after a dural tear. Case report. *Neurosurg Focus* 2004;17:10-10.3171/foc.2004.17.6.10. Article CAS Google Scholar
20. Harris LF, Haws FP, Triplett JN, Maccubbin DA. Subdural empyema and epidural abscess: recent experience in a community hospital. *South Med J* 1987;80:1254-8. 10.1097/00007611-198710000-00014. Article CAS PubMed Google Scholar
21. Hlavin ML, Kaminski HJ, Ross JS, Ganz E. Spinal epidural abscess: a ten year perspective. *Neurosurgery*. 1990;27:177-84. 10.1097/00006123-199008000-00001. Article CAS PubMed Google Scholar
22. Benzil DL, Epstein MH, Knuckey NW. Intramedullary epidermoid associated with an intramedullary spinal abscess secondary to a dermal sinus. *Neurosurgery* 1992;30:118-21. Article CAS PubMed Google Scholar
23. Fraser RA, Ratzan K, Wolpert SM, Weinstein L. Spinal subdural empyema. *Arch Neurol* 1973;28:235-8. Article CAS PubMed Google Scholar
24. Gelfand MS, Bakhtian BJ, Simmons BP. Spinal sepsis due to *Streptococcus milleri*: two cases and review. *Rev Infect Dis*. 1991;13:559-63. Article CAS PubMed Google Scholar
25. Volk T, Hebecker R, Ruecker G, Perka C, Haas N, Spies C. Subdural empyema combined with paraspinal abscess after epidural catheter insertion. *Anesth Analg* 2005;100:1222-23. 10.1213/01.ANE.0000149040.54969.B4. Article CAS Google Scholar
26. McClelland S, Hall WA. Postoperative central nervous system infection: incidence and associated factors in 2111 neurosurgical procedures. *Clin Infect Dis* 2007;45:55-59. 10.1086/518580. Article PubMed Google Scholar
27. Carey ME. Infections of the spine and spinal cord. *Youmans Neurological Surgery*. Edited by: Youmans JR 1996, Philadelphia: WB Saunders, 3278-9. 4 Google Scholar
28. Yadav RK, Agarwal S, Saini J. Profile of compressive myelopathy as evaluated by magnetic resonance imaging. *J Indian Med Assoc* 2008;106:82-84. Google Scholar
29. Shibasaki K, Harper CG, Bedbrook GM, Kakulas BA. Vertebral metastases and spinal compression. *Paraplegia* 1983;21:47-61. Article CAS PubMed Google Scholar
30. Wagner DK, Varkey B, Sheth NK, Damert GJ. Epidural abscess, vertebral destruction and paraplegia caused by extending infection from an aspergilloma. *Am J Med* 1985;78:518-22. 10.1016/0002-9343(85)90349-3. Article CAS PubMed Google Scholar
31. Abramovitz JN, Baston RA, Yablon JS. Vertebral osteomyelitis, the surgical management of neurologic complications. *Spine* 1986;11:418-20. 10.1097/00007632-198606000-00003. Article CAS PubMed Google Scholar