

Case Report

Discitis and Back Pain: A Rare Infective Complication of a Common Emergency Department (ED) Presentation

Naser Mohamad Mansoor¹, Ali Haider Ali^{2*}, Haris Rauf Mohammed³, Zainab Khalil Mohamed Al-Saati⁴, Nadera Hasan Juma Ali⁵, Maawa Merza Juma⁶, Sara Abdulaziz Ahmed⁷ and Ruqaya Al-Shamma⁸

¹Dr. Naser Mohamad Mansoor, Consultant Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

²Dr. Ali Haider Ali, Resident Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

³Dr. Haris Rauf Mohammed, Consultant Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

⁴Dr. Zainab Khalil Mohamed Al-Saati, Consultant Family Medicine, Acting Chief of Health Studies and Specialties, Supreme Council of Health, Kingdom of Bahrain.

⁵Dr. Nadera Hasan Juma Ali, Consultant Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

⁶Dr. Maawa Merza Juma, Specialist Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

⁷Dr. Sara Abdulaziz Ahmed, Resident Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

⁸Dr. Ruqaya Al-Shamma, Resident Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

***Corresponding author:** Ali Haider Ali, Resident Emergency Medicine, Salmaniya Medical Complex, Kingdom of Bahrain.

Abstract:

Discitis is the inflammation of the intervertebral disc. It is an uncommon diagnosis for a widespread complaint in the Emergency Department. Patients usually present with low back pain, with neurological deficits occurring in cases of compression. Examination may show mild tenderness over the affected area. Paraplegic patients typically have no pain and may be associated with autonomic dysfunction, which includes urinary bladder and bowel

incontinence. Investigations include baseline serum makers and blood cultures to isolate the causative microorganism. Radiological investigations include X-rays and magnetic resonance imaging (MRI). MRI aids and gives the best diagnostic value as it helps to exclude any soft tissue complications. Usual therapy includes antibiotics and surgical intervention to prevent and decrease any spinal compression occurring. This paper discusses two cases of pyogenic and tuberculosis-induced discitis, with varying presentations within the ED.

Keywords: “Discitis”, “Low Back Pain”, “Orthopedic”, “Tuberculosis”, and “Pyogenic”

Introduction:

Infectious processes within the vertebral column are a relatively uncommon diagnosis in the Emergency Department (ED) (1). Appearing as what is usually considered a benign and common presentation such as back pain, it is quite often missed, leading to life-threatening complications such as epidural abscess, quadriplegia, tendon injury, and spinal fractures (1). Therefore, these infections have been categorized to include vertebral osteomyelitis, epidural abscess, and discitis (1-2). Discitis is known as the infection of the intervertebral disc and is considered to be one of the rarest presentations to occur (2). It is commonly associated with surgical intervention and instrumentation within the vertebral column, thus it is noted as a postoperative complication and with other etiologies being uncommon (2). Moreover, without early diagnosis and intervention, discitis has a high mortality rate of between 2 to 20% (2). This case report shall discuss two presentations of discitis, from an extreme presentation of paralysis to a patient complaining of chronic back pain, with two different nonoperative etiologies.

Case One:

A 33-year-old South Asian male, with no prior medical history, presented to the Emergency Department (ED) with complaints of loss of sensation and inability to mobilize the bilateral lower limb. The patient stated that five days before presentation, he noted difficulty in the passage of urine associated with descending weakness of his lower limb. On the day of the presentation, he was unable to pass urine and could not move his lower limb. Minor thoracic

pain was present as well. On examination, the power of the lower limb was 1/5, with decreased reflexes in the knee and ankle. Furthermore, the bladder was palpable with rectal tone decreased. On palpation of the spine, thoracic and lumbar tenderness was noted. Vitals signs were unremarkable. Laboratory Investigations are seen in Table 1. X-rays of the Thoracic and Lumbar spine were done, as seen in Figure 1. The patient was referred to an Orthopedic On-call for further evaluation. A Foley catheter was inserted for the patient with 2 liters drained upon insertion.

After examination by the orthopedic team, Magnetic Resonance Imaging (MRI) of the Spine was done, as noted in Figure 2. MRI revealed multilevel spondylodiscitis, affecting T7 to T8 associated with abscess formation and bone marrow edema extending from T6-T10, leading to severe spinal cord compression. Furthermore, bone marrow edema and collection within the paravertebral space is seen in L1 – L2. Moreover, a small epidural collection was seen in S2 – S3. Such findings were correlated with an infectious process, more likely tuberculosis. Decompression of the thoracic spinal cord via costotransversectomy was done emergently. Postoperatively, the patient was started on anti-tuberculosis therapy due to Positive PCR. The patient was able to move all limbs postoperatively with power improving by 4/5 and was discharged from the hospital on anti-tuberculosis therapy.

Table 1: Laboratory Investigation done at the ED.

Investigation	Value
White Blood cells	12.44 x10 ⁹ /L
Hemoglobin	14.60 g/dL
Sodium	132 mmol/L
Potassium	5.00 mmol/L
Bicarbonate	26 mmol/L
Creatinine Kinase	212 U/L

Figure 1: X-Ray Imaging of the Thoracic and Lumbar Spine, performed at the ED.

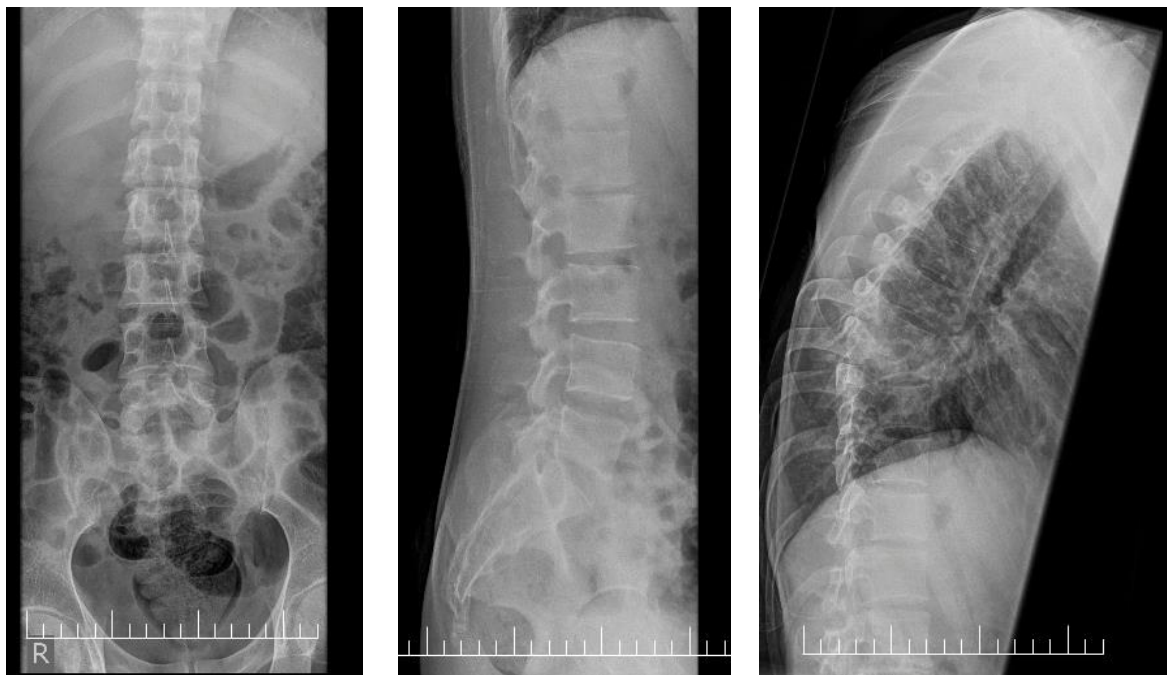
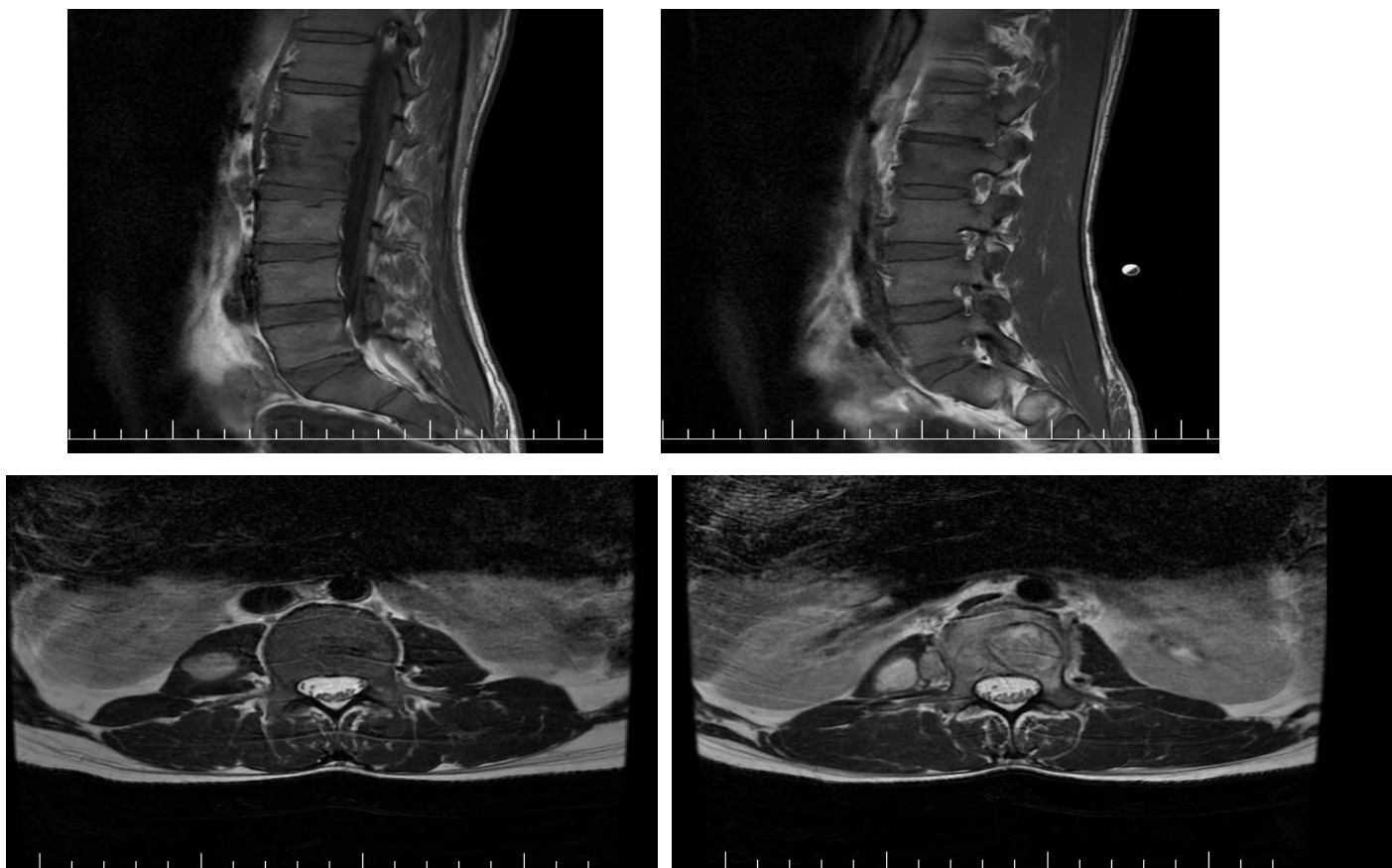


Figure 2: MRI of the Whole Spine, which was performed at the ED.

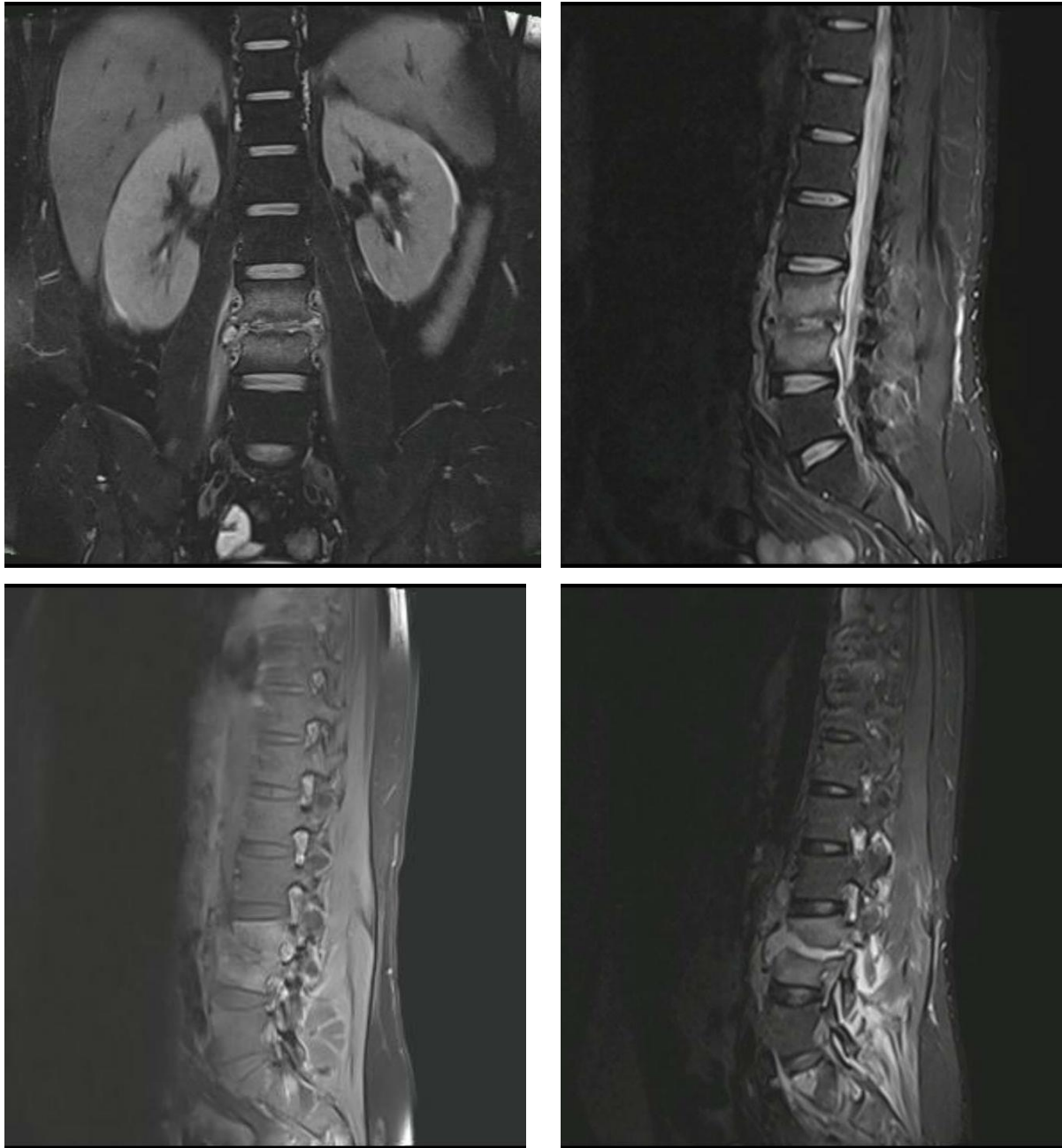


Case Two:

A 35-year-old Middle Eastern male, with a known history of chronic hepatitis C and intravenous drug use (heroin), came to the ED with complaints of Lower Back Pain for three days. The patient was incarcerated at the time of presentation. Furthermore, the patient was a recurrent visitor to the ED, seeking opioids for pain management and refusing any further investigations. The pain was mainly in the lumbar region, associated with numbness along the lower limbs. Vital signs showed a low-grade fever of 37.9 degrees and otherwise was unremarkable. Neurological examination was unremarkable with normal power, reflexes, gait, and rectal tone. Mild tenderness was noted on palpation. Although the patient's physical examination was normal, he was referred to an orthopedic for further evaluation.

MRI was done as an inpatient with a diagnosis of discitis involving T3 to T4 with spinal cord compression due to severe inflammation and destruction within the bone, shown in Figure 3. The patient was taken for an emergent spinal cord compression and intravenous antibiotics. Postoperatively, the patient developed bilateral pleural effusion and multiple pulmonary infarcts. The likely etiology was noted as septic emboli. An Echocardiogram was done and noted the presence of vegetation on the mitral valve regarded as infective endocarditis. Treatment was done as per the protocol.

Figure 3: MRI of the Whole Spine, performed at the ED.



Discussion:

The vertebral canal is divided into multiple regions anatomically which include cervical, thoracic, lumbar, and sacral regions (2-3). Each region is associated with certain nerve roots that supply sensory, motor, and autonomic innervation to various parts of the body (2, 4). The column consists of vertebrates with intervertebral discs between them. It is important to note

that each region within the column has an anatomically distinctively shaped vertebra (4). The intervertebral disc however consists of two parts, which include (3):

- Annulus Fibrosus: A fibrotic outer tissue.
- Nucleus Pulposus: An inner gel-like material.

The intervertebral disc sits between each vertebra to aid in the transition of pressure within the column and acts as a cushion between the vertebrae to aid in giving space for the nerve roots to exit the column and innervate the specific region (3). Thus, any infectious process may affect any parts of the column. These infections include osteomyelitis, discitis, spondylitis, spondylodiscitis, septic facet arthritis, posterior element osteomyelitis, and hardware-associated vertebral osteomyelitis (3). Most diseases are divided depending on the anatomic location of the affected part within the column (3). They are furthermore subsided into etiology based; these include (3-5):

- Pyogenic: These are the most common and usually are associated with microorganisms that create pus, due to necrosis of the affected area. An example is *Staphylococcus Aureus*, which is associated with intravenous drug users.
- Non-Pyogenic: These include atypical pathogens that create granuloma within the affected anatomic area. Most commonly includes *Mycobacterium Tuberculosis* leading to Potts disease, which affects the vertebral body. Such cases are usually seen in immunocompromised or untreated tuberculosis in low socioeconomic societies.

In terms of epidemiology, it has been noted that 2.9 to 5.4 patients per 100,00 have been recently diagnosed with discitis (4,6). In a recent article, it was noted that diagnosed cases have been on the rise reaching up to 11.3 per 100,00 patients with related risk factors for such a dramatic rise in diagnosis including (6-7):

- Increase the use of intravascular devices and instrumentation, which increases the risk of bacteremia.
- The aging of the population, being on average of 55 to 60 years old.
- Increase use of recreational drugs, mainly intravenous drug use.

- An increasing number of immunosuppressed patients. These include and are not limited to diabetes mellitus, corticosteroids, immunosuppressant medications, Human Immunodeficiency Virus (HIV) infection, etc.

Discitis and other infectious etiologies may occur due to multiple pathophysiologic routes which include hematogenous spread, contiguous spread from adjacent tissue, and direct inoculation from either trauma or surgical manipulation (3). Most commonly hematogenous spread is noted as the cause of spread, usually from another infectious site such as endocarditis, soft tissue infections, and intravenous drug use (8). It is important to note that in an adult, the high vascularity of the marrow and bone leads to the creation of a strong environment for bacterial growth (3, 5). Therefore, the infection may rapidly grow and affect multiple areas within the column, two vertebral bodies, and the discitis between them due to the bifurcation of the arteries to support both end plates (9). The isolated microorganisms can be seen in Table 2.

Table 2: Microbiology Isolated from Vertebral Infections.

Microorganisms
<i>Staphylococcus Aureus.</i>
Methicillin Resistant <i>Staphylococcus Aureus</i> (MRSA).
Enteric Gram-Negative Bacilli (following urinary tract instrumentation).
<i>Streptococci</i> (includes B, C, G, <i>Viridians</i> , <i>Milleri</i> , and <i>Bovis</i>).
<i>Pseudomonas Aeruginosa.</i>
<i>Mycobacterium Tuberculosis.</i>
<i>Brucella.</i>

Patient presentation may be insidious and appear as common benign presentations seen every day in the ED. The most common presentation is back pain, which depends on the part of the column affected. It is important to note that over 10% of ED presentation is back pain, whether it is acute or chronic (9). Thus, such an important diagnosis can be easily dismissed as muscular pain, while it is a much more sinister diagnosis. Moreover, radiation of the pain will occur based on the nerve root affected. As seen in case 1, patients may appear as paraplegia, with pain being very minimal or mainly tenderness upon palpation of the area. It is important to note that a more severe presentation, may more likely be due to the formation of an epidural abscess. Such presentation includes (5, 10):

- Focal and extremely severe back pain.
- Radiculopathy that is progressive to motor and sensory deficits.
- Loss of bowel and bladder control.
- Loss of perineal sensation.
- Paralysis or paraplegia (depending on the affected part of the column).

Most may presume that due to the infectious etiology, fever may be a marked feature. Fever is an inconsistent finding, with 33% of patients presenting with fever (11). This has been noted due to the chronicity of most discitis etiology, leading to fever being absent. If present, it was noted that over 50% of patients had a low-grade fever between 37.6 to 37.9 degrees, which may be easily missed or disregarded (11).

In terms of investigation, routine baseline investigation such as a complete blood count, electrolyte panel, renal function, c-reactive protein, and other inflammatory markers may be useful in guiding the diagnosis although, history and physical examination of risk factors and deficits have a better diagnostic value (10, 12-13). Blood cultures are used to identify the causative organism (14). However, during surgical intervention, a bone biopsy is taken for culture to isolate the organism (12-14). Imaging is a useful diagnostic tool. Imaging modalities such as Magnetic Resonance Imaging (MRI) is a useful and noninvasive diagnostic tool for discitis (13). It usually will aid in ruling out any complications within the surrounding soft

tissue such as abscess formation (12). Typical MRI findings include decreased signal intensity in the infected disc with a loss of the endplate definition usually seen within T1 weighted images (Images 1 and 2), enhancement of the infected disc (with the use of contrast material), and increased signal with the T2 weighted images (12-14). With such imaging modalities used and specific findings, MRI gives a specificity of 90% (13). Although X-rays may be used, they have a low threshold in diagnostic value and usually show changes in very late changes (12, 14).

In terms of treatment, antibiotic therapy depends on the isolated organism from either cultures or biopsy during surgical intervention (14). Antibiotic therapy is usually initiated for six weeks for pyogenic discitis, with the RIPE regimen used for tuberculosis-induced discitis (14). Surgical intervention is usually done in the presence of neurological deficiencies such as paraplegia, the presence of abscesses (such as epidural or paravertebral) where percutaneous drainage is not useful, and cord compression. As seen in case 1, cord compression occurred leading to surgical decompression to preserve the spinal cord and neurological function (14-15).

Conclusion:

Vertebral column infections can have devastating neurological complications. The prompt diagnosis and initiation of therapy will aid in a better prognostic outcome. It is important to note that such a presentation may be easily missed due to the common complaint patients present with. Therefore, it is important to take proper history, examination, and investigations to exclude such serious complications and diagnoses.

References:

1. Berbari, Elie F., et al. "2015 Infectious Diseases Society of America (IDSA) Clinical Practice Guidelines for the Diagnosis and Treatment of Native Vertebral Osteomyelitis in Adults." *Clinical Infectious Diseases*, vol. 61, no. 6, July 2015, pp. e26–46, <https://doi.org/10.1093/cid/civ482>.
2. Bhavan, Kavita P., et al. "The Epidemiology of Hematogenous Vertebral Osteomyelitis: A Cohort Study in a Tertiary Care Hospital." *BMC Infectious Diseases*, vol. 10, no. 1, June 2010, <https://doi.org/10.1186/1471-2334-10-158> . Accessed 8 Dec. 2020
3. Cahill, David W., et al. "Pyogenic Osteomyelitis of the Spine in the Elderly." *Journal of Neurosurgery*, vol. 74, no. 6, American Association of Neurological Surgeons, June 1991, pp. 878–86, <https://doi.org/10.3171/jns.1991.74.6.0878> . Accessed 1 Sept. 2023.
4. Carragee, Eugene J., et al. "The Clinical Use of Erythrocyte Sedimentation Rate in Pyogenic Vertebral Osteomyelitis." *Spine*, vol. 22, no. 18, Sept. 1997, pp. 2089–93, <https://doi.org/10.1097/00007632-199709150-00005> . Accessed 19 Jan. 2022.
5. Cierny, George, et al. "The Classic: A Clinical Staging System for Adult Osteomyelitis." *Clinical Orthopaedics and Related Research*, vol. 414, Sept. 2003, pp. 7–24, <https://doi.org/10.1097/01.blo.0000088564.81746.62> . Accessed 2 Jan. 2021.
6. Conan, Yoann, et al. "Large Increase of Vertebral Osteomyelitis in France: A 2010–2019 Cross-Sectional Study." *Epidemiology and Infection*, vol. 149, Oct. 2021, p. e227, <https://doi.org/10.1017/S0950268821002181> . Accessed 6 May 2022.
7. Cottle, Lucy, and Terry Riordan. "Infectious Spondylodiscitis." *Journal of Infection*, vol. 56, no. 6, June 2008, pp. 401–12, <https://doi.org/10.1016/j.jinf.2008.02.005> .
8. Dagirmanjian, A., et al. "MR Imaging of Vertebral Osteomyelitis Revisited." *American Journal of Roentgenology*, vol. 167, no. 6, Dec. 1996, pp. 1539–43, <https://doi.org/10.2214/ajr.167.6.8956593> . Accessed 30 Nov. 2020.
9. Doutchi, Mahamadou, et al. "Changing Trends in the Epidemiology of Vertebral Osteomyelitis in Marseille, France." *New Microbes and New Infections*, vol. 7, Sept. 2015, pp. 1–7, <https://doi.org/10.1016/j.nmni.2015.04.008> .

10. Gupta, Arjun, et al. "Long-Term Outcome of Pyogenic Vertebral Osteomyelitis: A Cohort Study of 260 Patients." *Open Forum Infectious Diseases*, vol. 1, no. 3, 2014, <https://doi.org/10.1093/ofid/ofu107> . Accessed 8 Apr. 2022.
11. Ju, Kevin L., et al. "Predicting Patients with Concurrent Noncontiguous Spinal Epidural Abscess Lesions." *The Spine Journal*, vol. 15, no. 1, Jan. 2015, pp. 95–101, <https://doi.org/10.1016/j.spinee.2014.06.008>.
12. Kamani, I., et al. "Vertebral Osteomyelitis without Disc Involvement." *Clinical Radiology*, vol. 59, no. 10, Oct. 2004, pp. 881–91, <https://doi.org/10.1016/j.crad.2004.03.023>.
13. Lemaigen, Adrien, et al. "Characteristics of and Risk Factors for Severe Neurological Deficit in Patients with Pyogenic Vertebral Osteomyelitis." *Medicine*, vol. 96, no. 21, Wolters Kluwer, May 2017, pp. e6387–87, <https://doi.org/10.1097/md.0000000000006387> . Accessed 9 Aug. 2023.
14. Marie Beronius, Bo Bergman, Rune An. "Vertebral Osteomyelitis in Go"teborg, Sweden: A Retrospective Study of Patients during 1990? 95." *Scandinavian Journal of Infectious Diseases*, vol. 33, no. 7, Jan. 2001, pp. 527–32, <https://doi.org/10.1080/00365540110026566> . Accessed 12 Jan. 2022.
15. Principi, Nicola, and Susanna Esposito. "Infectious Discitis and Spondylodiscitis in Children." *International Journal of Molecular Sciences*, vol. 17, no. 4, Apr. 2016, p. 539, <https://doi.org/10.3390/ijms17040539>.

Citation: Naser Mohamad Mansoor, Ali Haider Ali, Haris Rauf Mohammed, Zainab Khalil Mohamed Al-Saati, Nadera Hasan Juma Ali, Maawa Merza Juma, Sara Abdulaziz Ahmed and Ruqaya Al-Shamma, *Adv Clin Med Sci*, "Discitis and Back Pain: A Rare Infective Complication of a Common Emergency Department (ED) Presentation". 2024; 2(1): 104

Received Date: August 11, 2024; Published Date: August 19, 2024

Copyright: © 2024 Ali Haider Ali. This is an open-access article distributed under the terms of the Creative Commons Attribution License.