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Rapidly Destructive "Dry" Infectious Spondylitis Caused by Methicillin-Resistant *Staphylococcus argenteus* in a Patient with Crohn's Disease: A Case Report

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Introduction

- In recent years, infections caused by less common staphylococcal species have been increasingly recognized, particularly among immunocompromised hosts. (such as **Crohn's Disease (CD)** with long-term immunosuppressants)

Fujimoto K et al, Pyogenic spondylitis caused by Staphylococcus schleiferi in a patient with Crohn's disease. 2022

- The Diagnostic Dilemma: "Dry" Infection
  - Immunocompromised states can blunt typical inflammatory responses (fever, abscess formation, high CRP).
  - This can lead to a "dry" presentation, mimicking osteoporotic compression fractures and causing significant diagnostic delays.

Aung MS et al, Distribution of virulence factors and resistance determinants in three genotypes of Staphylococcus argenteus clinical isolates in Japan. Pathogens. 2021

Case presentation-1/5

(Fig1) Serial anteroposterior and lateral plain radiographs demonstrating rapid progression of L1 vertebral body collapse despite initial conservative management. Initial radiographs obtained at presentation (A, B), Serial sagittal and axial computed tomography (CT) reconstructions demonstrating near-complete destruction of the L1 vertebral body with progressive kyphotic deformity over a short interval. Initial CT images(C,D)

A 68-year-old Female

C.C : Low back pain

O : 3 weeks ago

V : Worsening low back pain following a minor fall

Medical Hx : Long-standing Crohn's disease on Azathioprine

- **Initial X-ray & CT scan** : No paraspinal abscess, **Calcification** within the Rt iliopsoas muscle → Misinterpreted as an **Osteoporotic compression fracture**
- **MRI recommendation →** was deferred because of poor general condition and limited cooperation

Case presentation-2/5

- **Despite treatment, her symptoms progressively aggravated.**

C.C : Progressive low back pain and Both leg radiating pain

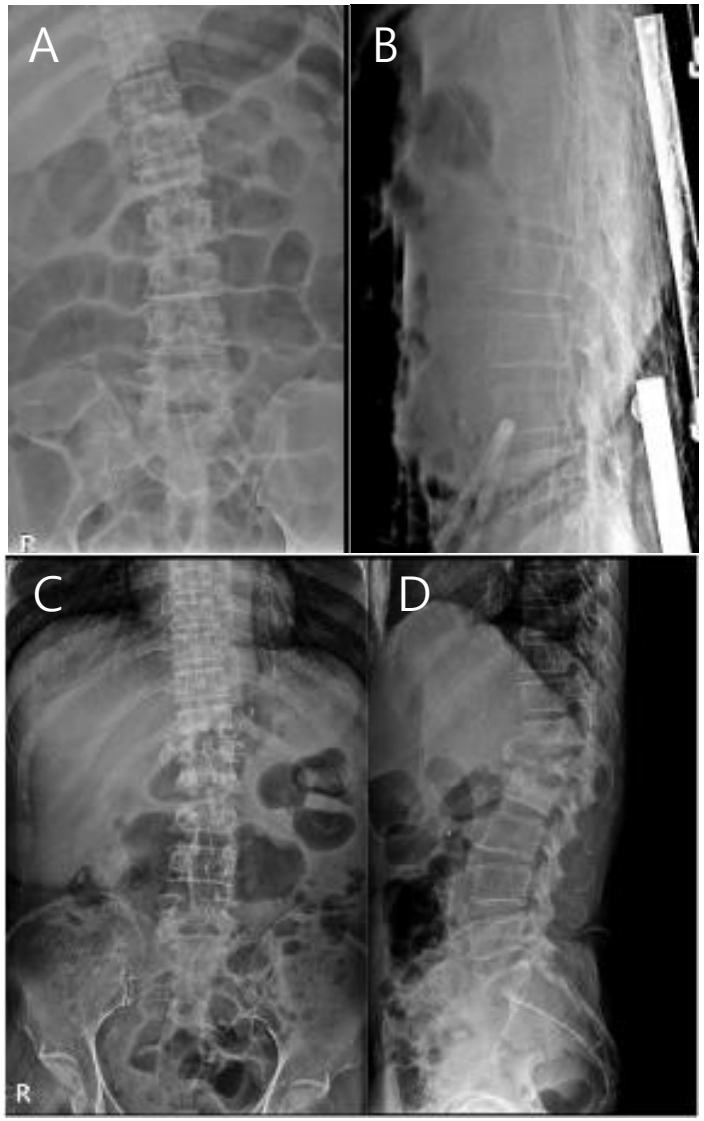
O : Gradual progression over 6 months periods

V : History of a fall, progressive aggrevation

N.Ex : Both lower leg weakness Gr(III/IV) & bladder and bowel dysfunction suggesting

Conus medullaris syndrome

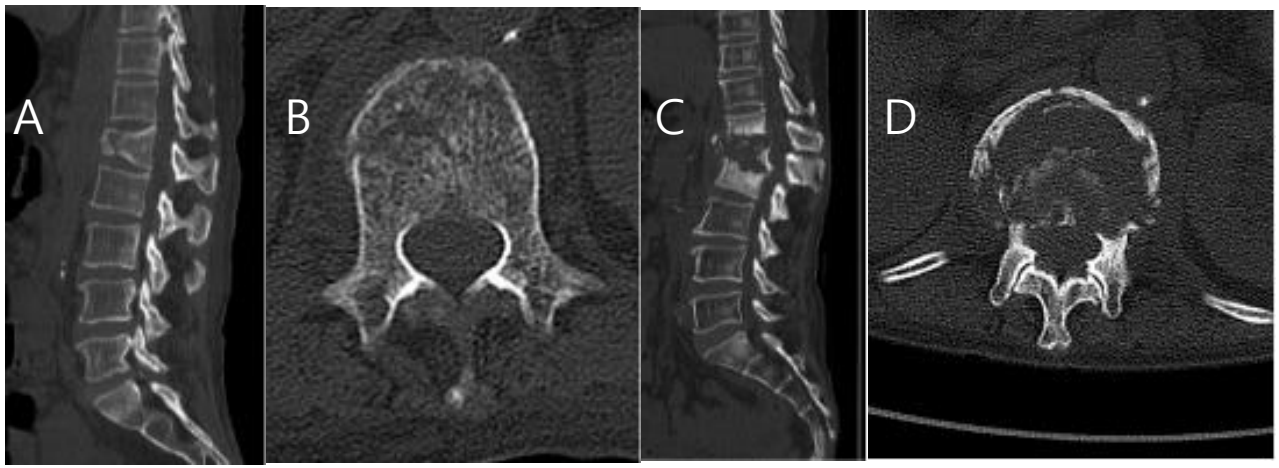
- **Pre-op. AP/Lat plain radiographs**
  Progressive L1 vertebral collapse over 6 months interval.



(Flg2) Initial radiographs obtained at presentation (A, B) and follow-up images during clinical deterioration (C, D) show progressive vertebral height loss and worsening kyphotic deformity.

Case presentation-3/5

- **Pre-op. CT scan (initial and last FU)**
  - Near-complete destruction of the L1 vertebral body and kyphotic deformity
- **Pre-op. MRI (initial and last FU**
  - Infectious spondylitis at T12-L2 with epidural and paraspinal abscess formation.



(Fig3) Serial sagittal and axial computed tomography (CT) reconstructions demonstrating near-complete destruction of the L1 vertebral body with progressive kyphotic deformity over a short interval. Initial CT images (A, B) show mild vertebral collapse without definite paraspinal abscess, whereas follow-up images (C, D) reveal rapid structural deterioration.

(Fig4) T2-weighted sagittal and axial magnetic resonance imaging (MRI) demonstrating infectious spondylitis involving T12–L2. Initial MRI images taken 2 months after injury (A, B) show moderate vertebral destruction with minimal inflammatory findings. Follow-up images obtained during neurological deterioration (C, D) demonstrate severe bony destruction with newly developed epidural and paraspinal abscesses.

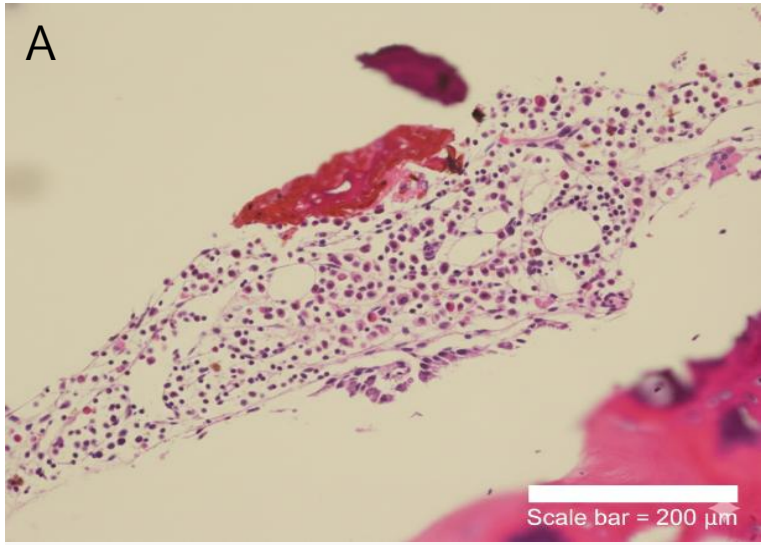
Case presentation-4/5

- **Intra-operative findings:**
  - **Surgical procedure**
    - Posterior stabilization from T10 to L4 (Perfix implant system)

      Posterolateral fusion : Allobone and BMP

      L1 subtotal corpectomy (Lt 10th rib retroperitoneal approach)

      Expandable titanium cage (VLIFT cage) between T12 and L2
  - Findings : Extensive bone destruction and fibrosis, without evidence of acute infection or macroscopic pus
- **Culture** : Methicillin-resistant ***Staphylococcus argenteus***
- **Antibiotic therapy** : IV Vancomycin → Oral Linezolid for 6 weeks



[Culture Results]
Organism #1: Staphylococcus argenteus

B

[Antibiotic Sensitivity Results]

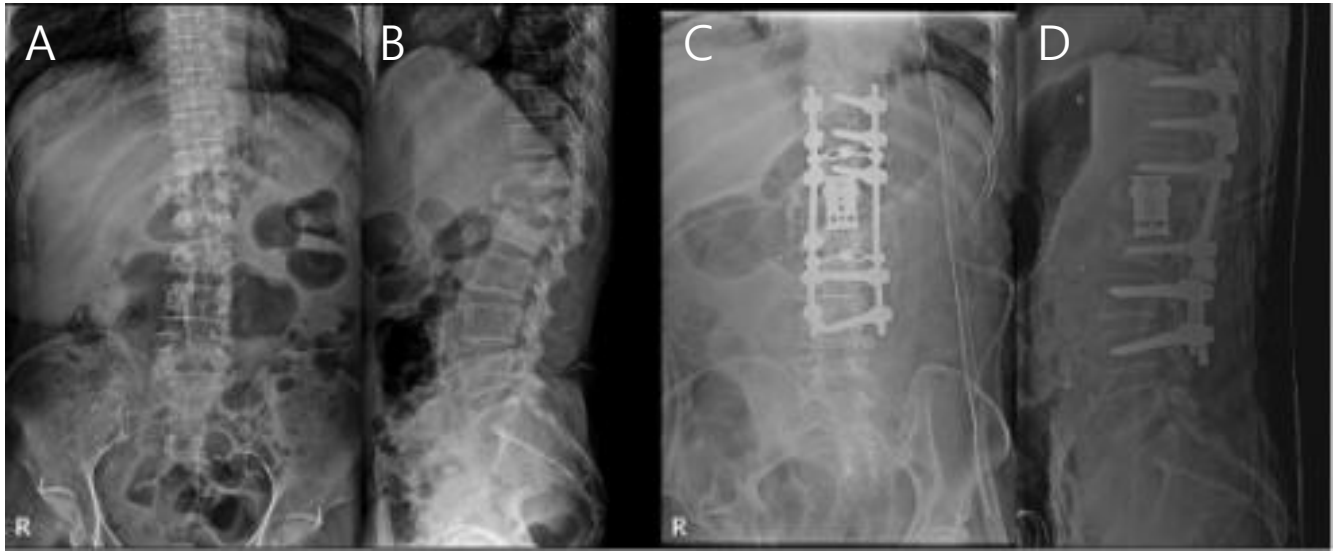
Antibiotic,MIC,Interpretation
Oxacillin,>= 4,R (Resistant)
Benzylpenicillin,>= 0.5,R (Resistant)
Ciprofloxacin,>= 8,R (Resistant)
Levofloxacin,>= 8,R (Resistant)
Clindamycin,0.25,R (Resistant)
Erythromycin,4,R (Resistant)
Gentamicin,8,I (Intermediate)
Vancomycin,<= 0.5,S (Susceptible)
Teicoplanin,<= 0.5,S (Susceptible)
Linezolid,1,S (Susceptible)
Rifampicin,<= 0.03,S (Susceptible)
Tetracycline,<= 1,S (Susceptible)
Trimethoprim/Sulfa,<= 10,S (Susceptible)

[Laboratory Comments]
Methicillin-resistant Staphylococcus isolated.
When using Gentamicin for susceptible Staphylococci, it must be used in combination with other susceptible agents.

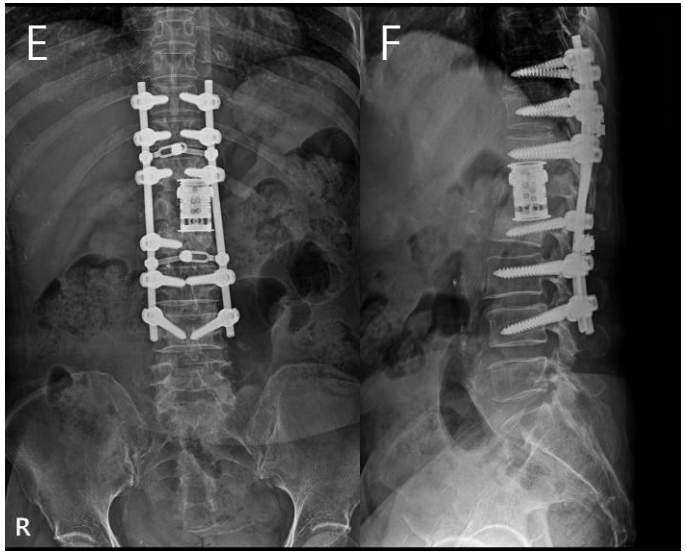
(Fig5) Histopathological and microbiological findings.
(A) Hematoxylin and eosin (H&E) staining of the L1 vertebral body demonstrating dense plasma cell infiltration within the bone marrow adjacent to cancellous bone, consistent with chronic inflammatory response to bacterial infection.
(B) Intraoperative tissue cultures yielding methicillin-resistant *Staphylococcus argenteus*.

Case presentation-5/5

- **Preoperative, post-operative and follow-up radiographs**
  - Normalized CRP
  - Significant improvement in pain and neurological deficits
  - Stable spinal alignment and solid interbony fusion at the last follow-up radiographs



(Fig6) Preoperative (A, B) and postoperative (C, D) plain radiographs demonstrating correction of kyphotic deformity and restoration of sagittal alignment following single-stage combined anterior–posterior reconstruction using an expandable titanium cage and posterior instrumentation.



(Fig7) Anteroposterior and lateral plain radiographs (E, F) obtained 1 year postoperatively demonstrating maintenance of sagittal alignment and solid interbody fusion without evidence of implant failure or recurrent infection.

Discussion-1/2

This case highlights several important clinical implications …

- First, infectious spondylitis in immunosuppressed patients with Crohn's disease may progress rapidly despite deceptively mild laboratory inflammatory findings. This underscores the need for a high index of clinical suspicion in this vulnerable population

- Second, emerging pathogens such as methicillin-resistant *S. argenteus* should be considered when culture results reveal atypical staphylococcal species.

- Finally, timely surgical intervention with radical debridement and stable reconstruction, combined with targeted antimicrobial therapy, can achieve satisfactory infection control and neurological restoration even in complex high-risk settings.

Discussion-2/2

- **However, this report has limitations** inherent to a single-case design, precluding generalization of outcomes.

- **Furthermore,** long-term follow-up beyond one year would be valuable to confirm sustained infection control and implant durability.

- **Nevertheless**, to our knowledge, this is the first report describing successful surgical reconstruction for methicillin-resistant *S. argenteus* spondylitis in an immunosuppressed patient with CD.

Conclusion

- Infectious spondylitis in immunosuppressed patients with Crohn's disease may follow an **unexpectedly aggressive course while lacking typical inflammatory manifestations.**

- Some pathogens (like *S. argenteus*) can lead **rapidly destructive course** of infectious spondylitis in immunosuppressed patients.

- This case demonstrates that **prompt surgical debridement and stable anterior–posterior reconstruction**, together with targeted antimicrobial therapy, can result in sustained infection control and meaningful functional recovery, even in complex high-risk settings.