



Case Report

Clostridium perfringens in the spine: A rare cause of post-surgical infection

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ABSTRACT

Background: Post-surgical infections of the spine occur in from 0% to 18% of cases. Postoperative spine infections due to Clostridium Perfringens (CP) resulting in necrotizing fasciitis are extremely rare. However, since they may be fatal, early and definitive treatment is critical.

Case Description: A 62-year-old male with a T8-T9 Type C fracture, in ASIA Grade “E” (neurologically intact) underwent a posterior T6-T10 arthrodesis. However, 2 weeks postoperatively, he developed a postoperative thoracic wound infection; the cultures were positive for CP. As the patient developed necrotizing fasciitis, emergent debridement, negative pressure continued drainage, and initiation of appropriate antibiotic therapy were critical.

Conclusion: Postoperative spinal infections due to CP with accompanying necrotizing fasciitis are extremely rare. As these infections may be fatal, they must be rapidly diagnosed and treated.

Keywords: Clostridium perfringens, Discitis, Necrotizing fasciitis, Postoperative infection, Spine

INTRODUCTION

Clostridium perfringens (CP) is a gram-positive anaerobic spore-forming microorganism found in the gastrointestinal tract and is the most common cause of gas gangrene. As CP can result in necrotizing fasciitis, with rapid progression to myonecrosis, gas production, and sepsis, CP must be rapidly diagnosed and treated (i.e. with antibiotics and surgical debridement).^[9] Here, we report a 62-year-old male who, 2 weeks following a T6-T10 instrumented fusion, developed CP with necrotizing fasciitis that was immediately diagnosed and treated with operative debridement, continued negative pressure suction, and appropriate antibiotic therapy.

CASE REPORT

A 62-year-old male presented with a T8-T9 Type C fracture; neurologically intact [Figures 1 and 2] he underwent an open reduction with a transpedicular T6-T10 fusion; no decompression was warranted. Seven days post-discharge, he presented with new serous fluid draining through the discolored wound; within 12 h, the grayish malodorous fluid was accompanied by “bubbles.”

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Lab studies

Blood tests showed an elevated erythrocyte sedimentation rate (ESR 96 mm/H), a high C-reactive protein (CRP 12.6 mg/L), and increased peripheral leukocyte count (WBC 15,200/ μ L); all studies were consistent with sepsis.

Diagnostic studies

As the thoracic CT scan showed gas within the T6-T10 thoracic wound T6-T10 [Figure 3], the patient

underwent an emergency decompressive procedure with/wash-out, and the placement of an intermittent negative pressure suction system [Figure 4]. At surgery, 100 mL of grossly purulent material was found along with necrotizing fasciitis (i.e., lysis of fascia and paravertebral muscles).

Antibiotic therapy

Cultures were taken which later showed CP. Although intravenous vancomycin was initially started

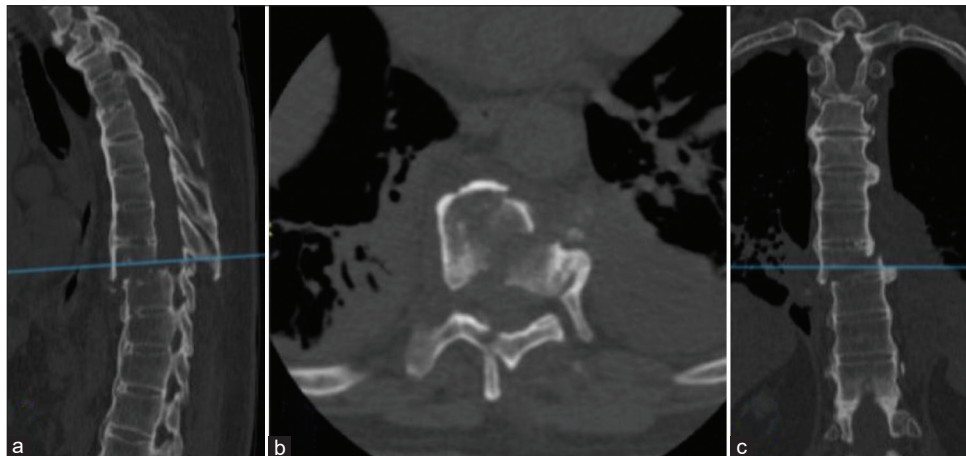


Figure 1: Computed Tomography Scan (a) Sagittal view (b) Axial view (c) Coronal view. lesion type C T8-T9.

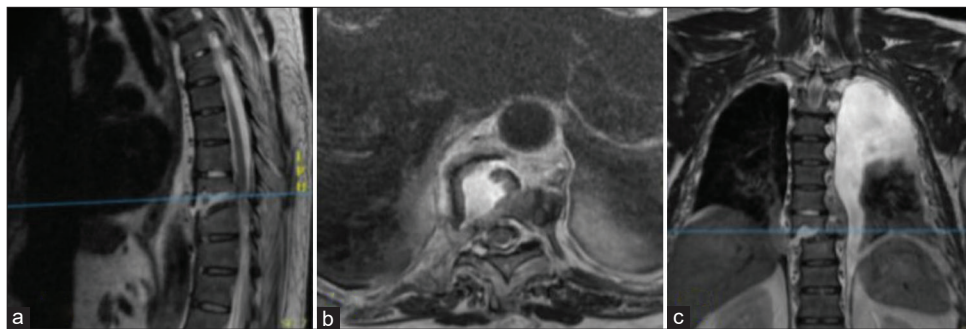


Figure 2: Magnetic resonance imaging T2 (a) Sagittal view (b) Axial view (c) Coronal view. It evidence lesion type C T8-T9.

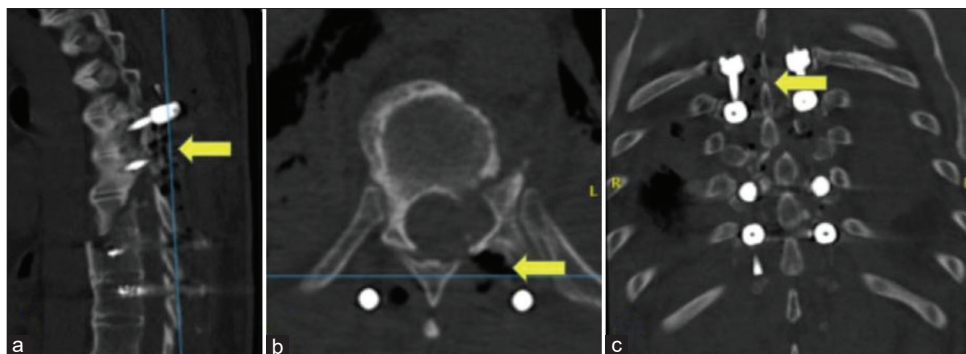


Figure 3: Computer tomography Scan (a) Sagittal view (b) Axial view (c) Coronal view. Yellow arrows indicate presence of gas.

postoperatively, 5 days later, the CP cultures showed sensitivity to Ceftaroline.

Postoperative course

Surgical wash-outs and drainage with the negative pressure suction system were repeated 4 times over 3 weeks During which time the patient continued to improve. He was discharged after 6 postoperative weeks, and of interest, the patient retained the transpedicular instrumentation system without the need for revision 6 months postoperatively [Figure 5].

DISCUSSION

The presence of primary spine infections due to CP are rare,^[1,3,4,6,11-15] [Table 1], We defined 4 such similar cases in the literature, and added our 5th case to this list.^[2,5,10] [Table 2].

Necrotizing fasciitis due to CP

Necrotizing fasciitis due to CP usually occurs in the 2nd postoperative week. A CP infection of the spine usually causes the new onset of pain, fever, and potential neurological dysfunction, depending upon its location spine). Typically, there is a serious exudate that is grayish and contains bubbles.

Lab studies typical for CP

Laboratory tests for CP often demonstrate elevation of the peripheral white blood cell count plus acute phase reactants such as CRP, and the erythrocyte sedimentation rate.

Radiologist studies for CP

Radiographic studies for CP classically demonstrate gas within the wound and paravertebral space. As these lesions

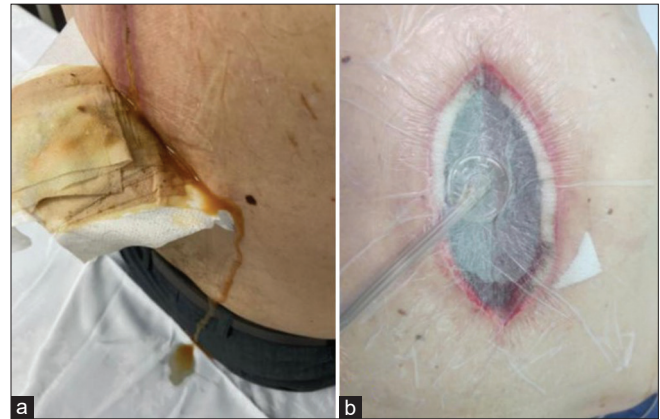


Figure 4: (a) Infected surgical wound (b) Placement of negative pressure treatment.

Table 1: Primary cases of discitis and spondylodiscitis due to clostridium perfringens.

Author	Publication year	Patients	Age	sex	Localization	Symptoms	Outcome
Pate and Katz ^[13]	1979	1	62	Female	Discitis L3-L4	Lumbar pain	Alive
Beguiristain <i>et al.</i> ^[3]	1986	1	33	Male	Discitis L1-L2	Lumbar pain	Alive
Caudron <i>et al.</i> ^[6]	2008	1	79	Female	Discitis L4-L5	Lumbar pain	Alive
Marín <i>et al.</i> ^[14]	2014	1	65	Male	Spondylodiscitis L1-L3	Fever, lumbar pain	Dead
Lotte <i>et al.</i> ^[11]	2014	1	83	Female	Discitis L4-L5	Lumbar pain	Alive
Akagawa <i>et al.</i> ^[1]	2015	1	78	Female	Spondylodiscitis T11-T12	Dorsal pain	Alive
Seller <i>et al.</i> ^[14]	2016	1	64	Male	Spondylodiscitis L5	Lumbar pain	Alive
Yong and Lam ^[15]	2017	1	80	Male	Discitis T10-T11	Dorsal pain	Alive
Bhatt and Singh ^[4]	2021	1	64	Male	Discitis L5-S1	Lumbar pain	Alive

Table 2: Cases of post-surgery infection of clostridium perfringens.

Authors	Publication year	Patients	Age	Sex	Localization site of infection	Treatment	Symptoms	Outcome
Brook and Frazier ^[5]	1999	2	NA	NA	NA	NA	NA	NA
Kristopaitis <i>et al.</i> ^[10]	1999	1	76	Male	L4-L5	NA	Lumbar pain and meningitis	Alive
Bednar ^[2]	2002	1	68	Male	L4-L5	Surgery, antibiotic treatment	Lumbar pain	Alive
Marroquin-Herrera <i>et al.</i>	2021	1	62	Male	T6-T10	Surgery, antibiotic treatment	Dorsal pain and outflow of grey and purulent liquid	Alive

NA: Not mentioned in the article

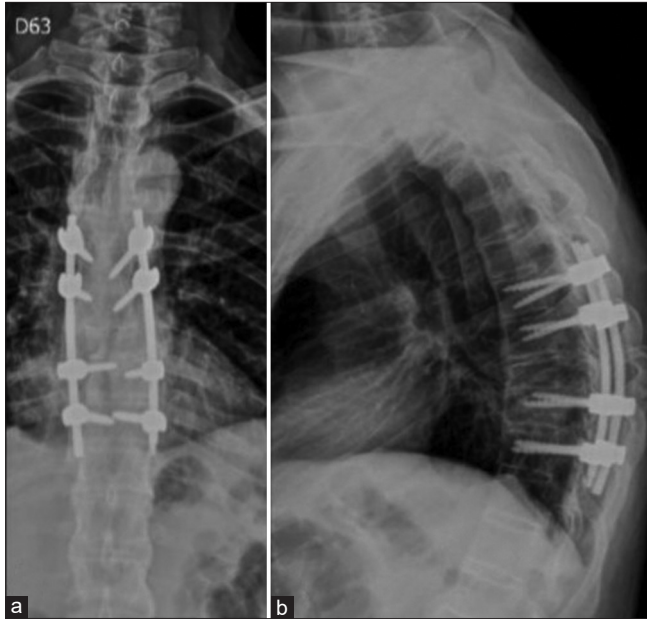


Figure 5: Radiography of thoracic spine. (a) Anterior - Posterior view (b) Lateral view. It observe correct placement of pedicle screws without signs of misplacement or vertebral lysis.

may prove fatal, they typically warrant emergent surgical debridement/wash-out, continued negative pressure drainage, and appropriate antibiotic therapy.^[7,8,9]

CONCLUSION

CP is a rare cause of postoperative spine infections, As necrotizing fasciitis attributed to CP can be fatal, it should be rapidly diagnosed and treated (i.e., with operative debridement, continued negative suction drainage, and antibiotic therapy).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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