

Mycobacterium Smegmatis Infection of a Lumbar Spine Instrumented Fusion

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Abstract: Problem statement: To demonstrate the presentation of atypical mycobacterial post-surgical infections and their management. **Approach:** Single patient case report. **Results:** Successful management of atypical mycobacterial post operative infection with preservation of instrumented hardware posterior pedicle screw fixation and interbody cages. **Conclusion:** This report suggests that these atypical mycobacterial infections can be eradicated with successful outcomes with preservation of spinal instrumentation.

Key words: Atypical mycobacterial infections, post surgical infections, mycobacterial smegmatis

INTRODUCTION

Wound infections from atypical mycobacteria are uncommon, but are often detected because of recognition of their biological hardiness. Some of these atypical organisms can thrive at high temperatures of 45 C (centigrade) or above and resist sterilization with organomercurials (10% Povidone-Iodine), Chlorine, 2% Formaldehyde, alkaline glutaraldehyde and other commonly used disinfectants (Wallace *et al.*, 1998). Post-operative infections have been reported in total joint arthroplasties, prosthetic breast implants (Widgerow *et al.*, 1995), corneal (Lasik) and cataract procedures (Merani *et al.*, 2008), vertebral or articular osteomyelitis (Astageneau *et al.*, 2001; Danesh-Clough *et al.*, 2000; Meier and Beekmann, 1995; Ollagnier *et al.*, 1998; Pruitt *et al.*, 1993; Smith, 1976; Han *et al.*, 2007), sternotomies, soft tissue wound infections (Weed *et al.*, 1956; Hand and Sanford, 1970), hernia 'mesh' repairs, abdominal wall abscesses, prosthetic cardiac valves, ventriculo-peritoneal shunts, after EMG-NCS procedures, catheter infections and post-injection abscesses (O'Brien and Rawluk, 1999; Kalita *et al.*, 2005). Most early papers considered these post-operative wound infections to be related either to environmental factors or host factors, especially those associated with immunocompromised patients (Yano *et al.*, 2004; Sumner *et al.*, 2003). However; more recent studies show infections secondary to these organisms in non-immunocompromised patients (Danesh-Clough *et al.*, 2000; Kalita *et al.*, 2005; Watanakunakorn, C. and A. Trott, 1973; Rahman *et al.*, 1992; Huang *et al.*, 2000). Contamination has included water sources for chilled surgical solutions, sterilization equipment (Wallace *et al.*, 1998; Huang *et al.*, 2000; Thami *et al.*,

2002) and water sources (Wallace *et al.*, 1998; Schulze-Robbecke *et al.*, 1992; Wallace, 1987; Wright *et al.*, 1985; Collins *et al.*, 1984; Slosarek *et al.*, 1993; Le Dantec *et al.*, 2002; Bullin *et al.*, 1970) and particularly hot water in hospitals (Astageneau *et al.*, 2001; Wallace, 1987; Wright *et al.*, 1985; Chada *et al.*, 1998).

This case report identifies a case of Mycobacterium Smegmatis infecting a L5/S1 interbody fusion procedure with biological cure; without hardware removal. This study demonstrates the difficulty with timely identification (Meier and Beekmann, 1995; Pruitt *et al.*, 1993; Weed *et al.*, 1956; Corpe *et al.*, 1961; Wallace *et al.*, 1988; Brown *et al.*, 1999; Marks and Schwabacher, 1965; Prosser, 1986; Cobbett, 1918), the need for increased vigilance for spread of the infection into deep tissues (Widgerow *et al.*, 1995; Han *et al.*, 2007; Plaus and Hermann, 1991), the role of multiple antibiotics/anti-fungals (Rahman *et al.*, 1992; Corpe *et al.*, 1961; Prosser, 1986; Nagao *et al.*, 2009; Roche *et al.*, 1997; Duttaroy *et al.*, 2004) and the management of this infection similarly to that of TB infections (Weed *et al.*, 1956; Watanakunakorn and Trott, 1973; Rahman *et al.*, 1992; Prosser, 1986; Nagao *et al.*, 2009; Roche *et al.*, 1997), with ultimate resolution.

The case is presented below: 56 y/o WF admitted for elective L5/S1 fusion and discectomy on 10-18-2004. Her prophylactic, pre-operative antibiotic coverage was Ancef 1 gm IV. The patient was discharged to home on post-operative day #4 with a dry, intact suture line. On post-operative day #11, she underwent staple removal. She called on post-operative day #21 for increased drainage from a re-opened incision. She was started on a trial of oral Keflex 500 mg orally QID. Her C-reactive

protein level and CBC were normal. Follow-up evaluation after 10 days of oral Keflex, revealed a persistent draining wound. A 'suture granuloma' at the draining site was suspected. Exploration under local anesthetic was performed on 12/2/2004. No granuloma was found. Instead a large subcutaneous purulent cavity was packed and a re-exploration was planned to r/o deep fascial infection. A serendipitous acid-fast stain of the purulent material revealed acid fast bacteria. On 12/3/2004, she underwent formal exploration and packing, under general anesthesia. The thoracolumbar fascia was intact. Wound packing was initiated with saline soaked gauze dressing changes. She was discharged on a ten day antibiotic course (Keflex 500 mg QID) with a stable wound. Wound bacterial culture results reported on 12/8/2004 revealed *Staphylococcus Epidermidis* (2 species) one sensitive to Cephalothin; one resistant. A routine office visit on 12/15/2004 revealed the wound to be healing nicely off antibiotics. On 12/27/2004 we were notified by the New York State Laboratories that the acid fast bacterium was neither a *Mycobacterium Tuberculosis* nor *Mycobacterium Avium*. A follow-up visit on 1/14/2005, revealed a nearly healed wound. The NY State Laboratory identified a *Mycobacterium Smegmatis* on 1-17-2005. Because of increased symptoms of new left ankle and heel pain, the patient underwent a lumbar MRI with and without Gadolinium on 2-7-2005. This revealed a normal post-operative study. Her lumbar wound was well healed at follow-up on 2/11/2005.

On 2/14/2005 the patient was admitted to hospital due to worsening systemic symptoms-malaise, loss of weight and poor appetite. She was noted to have a rising ESR (from 55-96) and elevations in her C-reactive protein level (1.8-13) and WBC (7.8-17.8). On the next day a CT of lumbar spine revealed a large sub-fascial, epidural fluid collection. On 2/16/2005, she underwent an operation with opening of the thoracolumbar fascia, exploration of the extradural space and debridement without finding liquid purulence. An AFB stain was negative. The patient was packed open with TID dressing changes to facilitate drainage and healing; and discharged home. A follow-up CT scan of the lumbar spine on 2/21/2005 showed persistent or increased fluid extradural collections despite the open wound. She was readmitted for a CT guided biopsy of the lumbar spine fluid collections. The paraspinous collection on 2/25/2005 was positive for a greenish fluid aspirate. The patient was started on Amikacin, Ethambutal, Bactrim and Biaxin on 2/27/2005. A repeat CT scan of the lumbar spine on 3/4/2005 demonstrated reduction in the paraspinous fluid collections, with a clinically, improving fever curve. On

3/7/2005, the New York State Laboratory identified the 2/25/2005 CT aspirate as containing *M. Smegmatis*. The patient was discharged home on the above antibiotic regimen on 3/9/2005.

A repeat surveillance lumbar CT on 3/22/2005, unexpectedly, revealed the accumulation of a large psoas and lateral paraspinous of purulence. A CT guided abscess drainage procedure was undertaken with placement of a 10 Fr self-retaining catheter with 50 cc of purulence drained! She was seen in my office on 3/30/2005, with a nearly completely healed surgical wound and the draining "pig-tail" catheter. Clinically, she had an improving C-reactive protein and ESR.

A third surveillance CT of the lumbar spine on 4/11/2005 was obtained and revealed no residual fluid filled cavities. Her 'pig-tail' catheter was removed the next day.

An office visit on 5/5/2005 revealed a healed wound and drain site. Her C-reactive protein level was now normal. On her office visit of 6/15/2005, she noted slow steady weight gain. At the 1st annual office visit s/p lumbar fusion, she had solid x-ray evidence of healed L5/S1 fusion with intact instrumentation. On her 2nd annual office visit 10/17/2006, she had no recurrence of infection.

DISCUSSION

This case demonstrates the insidious onset of the infection despite the initial healing post-surgical wound (Pruitt *et al.*, 1993; Hand and Sanford, 1970; Chada *et al.*, 1998; Cobbett, 1918), the lack of response to surgical drainage alone (Widgerow *et al.*, 1995; Smith, 1976; Plaus and Hermann, 1991), the importance of expanding the extent of anatomic imaging studies, the role of interventional CT guided biopsy and drainage (Pruitt *et al.*, 1993; Brown *et al.*, 1999) and the role of antibiotic therapy with multiple antibiotics (Prosser, 1986; Hasegawa *et al.*, 1992). This study suggests that these atypical mycobacterial infections-like their TB counterparts-can be resolved in the face of retained hardware with aggressive medical treatment of these infections (Jain *et al.*, 2007; Chen *et al.*, 2011; Fukuta *et al.*, 2003; Kim *et al.*, 2004; Rappaport *et al.*, 1990; Guven *et al.*, 1994; Swanson *et al.*, 2006)-although other opinions exist (Plaus and Hermann, 1991; Hasegawa *et al.*, 1992).

CONCLUSION

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