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Case Report

Rare Case of Wide Spread Fungal Spinal Osteomyelitis with Severe Back Pain under Conservative Treatment. Case Report and Review of the Literature

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Abstract

We report the case of a patient approximately five years after therapy for lung carcinoma with surgery, radio- and chemotherapy who complained about increasing back pain in the cervico-thoracic spine.

Imaging initially suggested local intra-thoracical metastasis and some diffuse hyperdensity in the thoracic vertebras, but recurrent malignancy was not detected on biopsy. However, after new attemps Candida species could be detected and showed wide spread signal in vertebral bodies of the cercial and thoracic spine. Antifungal therapy of 9 months and orthesis resulted in pain reduction, so thatsurgery for spinal stabilization has not been necessary to date with recurrence of symptoms.

Keywords: Back Pain; Fungal Spondylitis; Lung Cancer

Introduction

Spondylitis (SD) is an osteomyelitis of the spine and defined as inflammation of vertebral bodies and mostly adjacent intervertebral discs as spondylodiscitis. It accounts for approximately 5% of all osteomyelitis with an annual incidence in Germany of 30/250.000 [1,2]. Staphylococcus aureus as the most common pathogen (50-60% of all spondylodiscitis/spondylitis) is the cause of non-specific spondylodiscitis together with other facultative pathogenic bacteria (e.g. viridans streptococci, enterobacterales). Specific spondylodiscitis is a rare subtype (annual incidence 1/250.000) [1,2] and is defined by its pathogen spectrum: mainly Mycobacterium tuberculosis. In very rare cases fungus can be diagnosed (around 1% of all SD) [3]. Immune-compromised or immune-suppressed patients are mostly affected. As this patient subpopulation has significantly increased during last decades, among others due to new treatment options of chronic diseases by immune-suppressants, spondylodiscitis in general, but in particular specific spondylodiscitis, is becoming more frequent.

Therapy and diagnosis of spondylodiscitis remains a major challenge in daily clinical practice due to its prolonged latency and morbitity to initial diagnosis and subsequent protracted treatment of multimorbid patients.

Case Report

A50-year-old female patient underwent multimodal treatment for lung cancer in the right upper lobe in 2015, with surgery followed by radiation therapy and chemotherapy. Initial presentation was in January 2019, when the patient complained about increasing pain in the upper thoracic spine for several months with back pain radiating cranially, caudally and ventrally. Neurological deficits were not present. At time of presentation, the patient suffered from constant pain of at least 8 of 10 on the Numerical Rating Scale (NRS), while movement increases symptoms. Bloodwork revealed a normal leukocyte count (6.3/nl {3.6-10}) and elevated mild C-reactive protein (6.1mg/dl {0-0.5}. Contrast-enhanced MRI of the cervical spine and upper thoracic spine showed an unclear change at level of T 2-4. Suspecting spinal metastasis per continuitatem from the former intra-thoracical tumor bed, bi-pedicular biopsy of T4 followed by vertebroplasty was performed. First of all, the procedure provided good pain relief, and the patient could be discharged on postoperative day 3 (Figure 1).

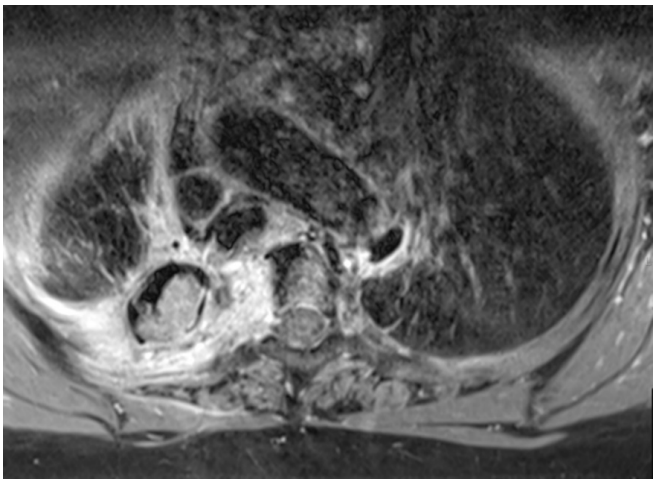

Figure 1: The axial T1-weighted sequence after gadolinium at the vertebral body of T4 showed the cavity of the former tumor bed adjacent to the spine in the left lung apex with surrounding scare enhancement and contact to the vertebral body.

Histopathologic workup revealed nonspecific chronic inflammatory changes with no evidence of tumor or bacterial contamination. A calculated antibiotic therapy was performed because of estimated pyogenic chronic infection.

5 months later, she presented with progressive pain, which regressed under conservative therapy already started by the patient independently. A control MRI of the cervical spine had been performed as an outpatient, but was not available at time of presentation. Another short-term presentation with current imaging did not take place. One month later, symptoms increased again with pain also reaching up to the neck. An updated MRI of the cervical and thoracic spine with contrast enhancement showed a significant worsening of the findings with wide spread affection from C5 to T4 (Figure 2).

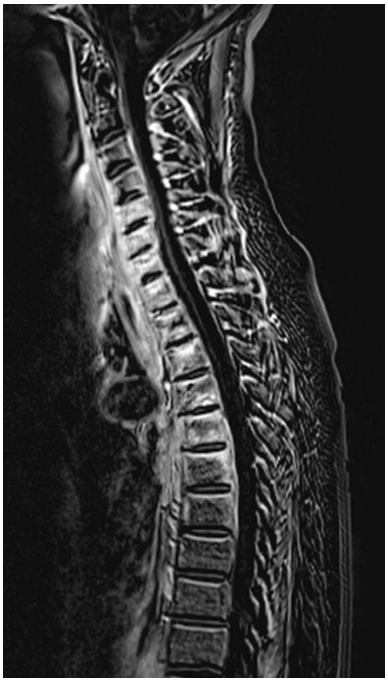

Figure 2: The sagittal T1-T1 gadolinium subtracted sequence showed affection of the cervical and upper thoracic spine.

Laboratory findings at this time included normal leukocytes (7.6/nl {3.6-10}), elevated C-reactive protein (8.8 mg/dl {0-0.5}) and 700mg/dl fibrinogen. Pro-calcitonin as additional infection marker was only elevated at 0.06 ng/ml {0-0.05}. After extensive discussions with the patient, we initially decided against another biopsy.

Under escalated antibiotic therapy, the parameters did not improve. Finally, another CT-guided biopsy was performed, this time of T3 and of right paravertebral soft tissue. In this biopsy, long-term incubation revealed small amount of Staphylococcus hominis, Staph. Epidermidis, Staph. haemolyticus, and above all Candida albicans and glabrata, sparingly in each case. No further therapy was begun because of suspected contamination.

In September 2019, MRI with contrast of the cervical and thoracic spine was performed as follow-up screening. Weeks before, the patient showed increasing complaints. An extended progression of findings with now affection of C2 to T9 prompted us to a new biopsy, now at level T6/7. Further, specimens of the former tumor cavity in the right upper lobe were acquired by CT-guided biopsy. Fungi were not detected in any of these samples, and PCR fungi 18s-RNA remained negative. Acid-fast rods were not detected (Figure 3).

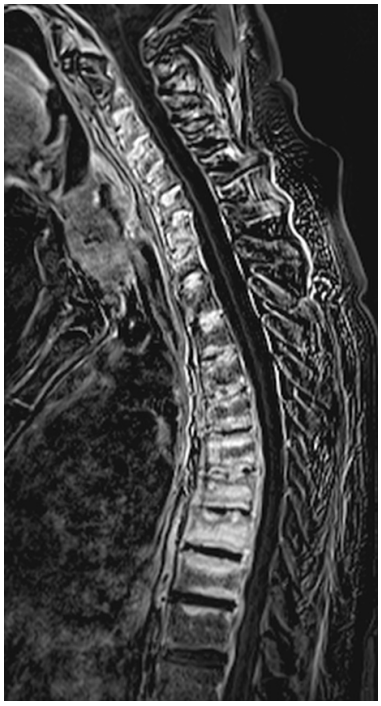

Figure 3: The sagittal T1-T1 gadolinium subtracted sequence detects progressive infection of the mid-level thoracic spine

Based on the previous microbiological results and due to the increasing symptoms, which correlated with the clearly worsening image findings, we started an intravenous antifungal therapy with Caspofungin daily for four weeks. In addition, an antibiotic therapy with Ceftriaxone and Flucloxacillin was given to treat the possible bacterial co-infection. Under this therapy, after treatment with orthesis and a change of analgesics to, the patient's symptoms improved considerably (pain to NRS 2-3), the inflammation values also decreased and were soon normal.

After four weeks of intravenous antibiotic and antifungal therapy, it was switched to amoxicillin/clavulanic acid and voriconazole daily. The patient was discharged in November 2019. Clinical examination and MRI control was performed in February 2020. The patient continued to benefit from that treatment and reported spinal pain at 2/10 NRS (Figure 4).

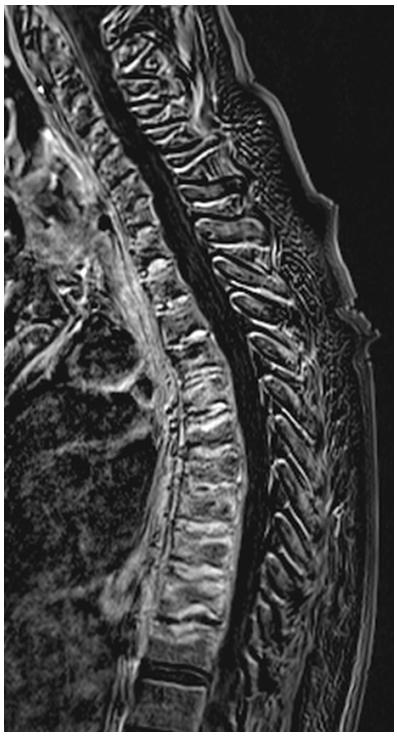

Figure 4: The sagittal subtraction sequence showed regressive enhancement

Now, compared to the previous imaging, the sagittal subtraction sequence showed regressive enhancement, especially in the cervical spine, but also in the vertebral bodies of the thoracic spine.

Contrast-enhanced MRI of the cervical spine/spinal cord showed a slight decrease in contrast enhancement. Antibiotic therapy was continued until March 2020 and stopped after a total of 6 months. Oral antifungal therapy was continued up to 12 months in total Regular laboratory chemistry checks revealed an intermittently mildly elevated CRP (2.61 mg/dl {<0.5 mg/dl}; no other abnormalities were found.

Recent stay in hospital was in April 2021 for acute localized lower thoracic spine pain, which was reported to an intensity of 9/10 NRS. Laboratory chemistry revealed at most mildly elevated inflammatory parameters (leukocytes 7.2/nl, CRP 0.95 mg/dl, PCT 0.04 ng/ml). Diagnostic imaging by MRI of the cervical spine, contrast-enhanced, and CT of the cervical spine revealed increasing erosion of the adjacent base and cover plates at level T10/11. In addition, there was discrete retrolisthesis of T10 as a possible sign of segmental micro-instability. With spontaneous improvement of the symptoms, the patient did not wish to undergo surgery for stabilization (Figure 5).

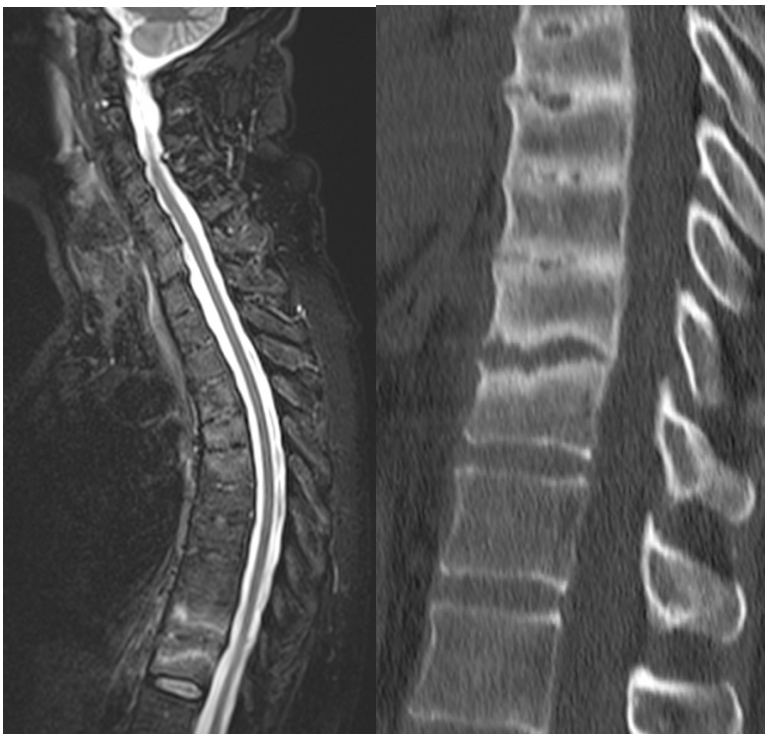

Figure 5: In the left TIRM-Sequence of the sagittal spine new hyper intense lesions adjacent to the T10/11 disk space were seen. Corresponding to the enhancement, CT scans showed erosion of the endplates.

Discussion

Diagnosis of fungal spondylitis or fungal spondylodiscitis is rare and often delayed [4]. This is equal to what we found in that patient. The frequent co-morbidity such as immune-suppression during or after tumor therapy also causes that in case of inconclusive findings in imaging metastasis seems to be more likely, which further prolongs finding a diagnosis [5,6]. In cases of suspected spondylodiscitis, an interdisciplinary approach involving spinal surgery or biopsy, infectious diseases and microbiology should be sought at an early stage. Blood cultures are often negative in Candida osteomyelitis because the fungemia often occurred several weeks or even months ago [5]. If spondylodiscitis is suspected and microbiologic evidence is absent or equivocal, consider repeating the biopsy; if necessary, PET-CT can be added in select cases [6,7]. Fortunately, the prognosis of Candida spondylodiscitis is good, with cure rates of 85% with appropriate therapy, which consists of one year of antifungal therapy [8,9]. We supplemented antibiotic therapy in case of initial mixed infection as well, as we suspected the former tumor cavity the initial start of a contiguous spread, which is associated with occurrence of multiple pathogens [10].

In the present case, we followed a cautious approach with regard to surgical therapy because of the diffuse findings and according to the patient's wishes providing the patient´s stabilization by an orthosis, which finally gives her the chance to make initially surgery unnecessary. However, the pronounced damage to the spine led probably to segmental instability at level of T10/11, although a focal recurrence could not be excluded.

Though, a later recommendation for surgery (stabilization of the segment T10/11) would be considerably less extensive than an operation in degree of the disease with the greatest severity, which would have consisted in stabilization of large parts of the cervical and thoracic spine.

We therefore conclude that cautious approach including repeated biopsy and prolonged medical treatment could be a feasible option especially in complex cases like these.

Conflict of Interest

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. This manuscript is a unique submission and is not being considered for publication, in part or in full, with any other source in any medium

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