A 27-Year-Old Woman Diagnosed with Tuberculous Spondylitis, or Pott Disease, During Pregnancy: A Case Report

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Patient: Female, 27-year-old
Final Diagnosis: Pott's disease
Symptoms: Worsening severe neck and back pain
Medication: Anti-tuberculosis medications
Clinical Procedure: Post-gadolinium contrast T1-weighted diffusion magnetic resonance imaging (MRI) demonstrated multiple soft tissue spinal lesion (T2-T4) • computed tomography (CT)-guided biopsy confirmed a case of Pott's disease
Specialty: Obstetrics and Gynecology

Objective: Rare disease
Background: Tuberculous spondylitis, or Pott disease, includes vertebral body osteomyelitis and intervertebral discitis following infection with Mycobacterium tuberculosis and can present with vertebral collapse and back pain. This report is of a 27-year-old woman diagnosed with tuberculous spondylitis, or Pott disease, during pregnancy.

Case Report: A 27-year-old female, in her first pregnancy and at 29 weeks of gestation, presented to the Emergency Department with worsening severe neck and back pain for the past 5 months. Post-gadolinium contrast T1-weighted diffusion magnetic resonance imaging demonstrated multiple soft tissue spinal lesions (T2-T4). Computed tomography-guided biopsy showed a central caseous necrosis enclosed by a granuloma containing a wide array of cells comprising epithelioid cells, Langhans giant cells, lymphocytes, and plasma cells. Ziehl-Neelsen staining was positive for acid-fast bacilli. The final diagnosis was consistent with Pott disease. The patient received anti-tuberculosis medications, her symptoms improved over time, and she delivered vaginally at term. At a 16-month follow-up, her symptoms had improved, and she returned to her normal daily activities. There were no complications arising from the use of gadolinium contrast in the mother or toddler.

Conclusions: This report has highlighted the importance of imaging of the spine in the diagnosis of causes of severe back pain. This rare presentation of Pott disease in pregnancy has shown the challenges in diagnosis and the importance of a multidisciplinary approach to diagnosis and management so that treatment protects both the mother and fetus.

Keywords: Magnetic Resonance Imaging • Mycobacterium tuberculosis subsp. tuberculosis • Pregnancy Outcome

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Background

Tuberculosis (TB) is one of the oldest known infectious diseases and it persists as a chief source of substantial morbidity and mortality worldwide [1]. Around 25% to 33% of the worldwide population has latent TB, according to the World Health Organization [2]. The true incidence of TB in pregnancy is unknown, owing to multiple confounding factors [3-5]. Tuberculous spondylitis, also known as Pott disease, is clinically defined by the presence of extrapulmonary TB that involves the spine and is secondary to blood-borne extension of TB from other bodily regions, mostly the lungs [6]. Patients with Pott disease typically present with vertebral body osteomyelitis and intervertebral discitis arising from TB infection [7]. In pregnancy, active TB disease should be eliminated prior to delivery [3]. The diagnosis of active TB during pregnancy should be treated with the typical 4 first-line agents, namely isoniazid, rifampin, ethambutol, and pyrazinamide [8]. All of these agents are classified as pregnancy category C [8]. Notably, owing to a lack of safety evidence, the use of pyrazinamide during pregnancy is debatable [8]. Nevertheless, pyrazinamide is indicated for pregnant women who have severe active TB disease, extrapulmonary TB, or HIV co-infection [8]. The treatment duration for active TB during pregnancy is 9 months and should be managed by an infectious disease specialist [8]. Although treatment for latent TB is not warranted for most women during pregnancy, all pregnant women with latent TB require close surveillance [3]. Prompt treatment of active TB during the course of pregnancy significantly impacts the prognosis. A meta-analysis of 13 studies by Sobhy et al revealed that maternal (eg, anemia and cesarean delivery) and fetal (eg, perinatal demise, preterm birth, and low birthweight) complications were lower in pregnant women with active TB who initiated TB therapy in the first trimester than in those who initiated active TB therapy later in the second and third trimesters [9]. In a prospective cohort study, van der Water et al reported high (96.6%, n=28/29) success treatment rates (cure rates) for pregnant women, regardless of TB drug-susceptibility. Pott disease is exceedingly rare in pregnancy and represents an exceptional clinical dilemma, with very few published case reports [10,11]. This report is of a 27-year-old woman diagnosed with tuberculous spondylitis, or Pott disease, during pregnancy and describes the challenges in diagnosis and management.

Case Report

A 27-year-old woman in her first pregnancy presented to our hospital at 29 weeks of gestation with a gradually progressive severe back and neck pain for 5 months, which was associated with numbness in the upper limbs. She also had nausea and vomiting. These symptoms started before pregnancy and worsened while she was in our Emergency Department. She did not have routine antenatal follow-up, but her pregnancy was uncomplicated. She denied any history of trauma or other neurological symptoms, gastrointestinal symptoms, urinary symptoms, colicky pain, and fainting episodes. She had no prior history of allergies, diseases, or surgeries. She denied taking any prescribed or over-the-counter medications. Her family history was unremarkable.

The body mass index was 33 kg/m²; her body weight and height measured 85.2 kg and 160 cm, respectively. On general examination, there were no features of jaundice or anemia. Her vital signs showed no fever, blood pressure of 115/72 mmHg, pulse of 75 beats/min; and respiratory rate of 18 breaths/min.

A head and neck examination revealed tenderness at the cervical and thoracic spine, with limited movement. There was no lymphadenopathy and the respiratory and cardiovascular examinations were unremarkable. On neurological examination, power, tone, and reflexes appeared normal in the upper and lower limbs bilaterally. The bladder and bowel functions were intact. The abdominal examination revealed the fundal level at 30 weeks, cephalic presentation, and positive fetal heart sounds.

The routine laboratory test results and urine analysis were within the normal limits except for a raised erythrocyte sedimentation rate of 120 mm/h. An obstetric ultrasound examination showed a single viable fetus, cephalic presentation, and an estimated fetal weight around 1301 g. There were no gross anomalies seen. Post-gadolinium contrast T1-weighted diffusion MRI of the brain and spine showed a large soft tissue at the level of T2, T3, and T4 measuring 3.4×5.0×5.4 cm in the transverse, anteroposterior, and craniocaudal dimensions, respectively (Figure 1). The soft tissue component had paraspinal and intraspinal components, causing mild spinal canal stenosis with a mild mass-occupying effect on the spinal cord without evidence of cord myelopathy. The brain study was unremarkable.

A multidisciplinary approach with maternal-fetal medicine, neurosurgery, neonatology, and radiology was done. The differential diagnosis with a higher likelihood included pyogenic spondylitis and tuberculous spondylitis, whereas the differential diagnosis with a lower likelihood included multiple myeloma, lymphoma, and metastatic spinal foci. A computed tomography-guided biopsy was obtained from the mass and sent for histopathological analysis. Histopathological examination revealed a central caseous necrosis enclosed by a granuloma containing a wide array of cells comprising epithelioid cells, Langhans giant cells, lymphocytes, and plasma cells. Ziehl-Neelsen staining showed positive acid-fast bacilli. The histopathological picture was consistent with tuberculous spondylitis (Pott disease). The patient was started on 4 typical anti-TB drugs, isoniazid 300 mg, rifampin 450 mg, pyrazinamide 1500 mg, and ethambutol 800 mg. Moreover, vitamin B6 (pyridoxine) 50 mg was initiated daily. During her follow-up visits, she showed gradual improvement in motor
power and less use of analgesic medications, with no signs of adverse effects. Spontaneous labor commenced at 38 weeks, and she progressed normally to deliver vaginally. A baby boy with a birth weight of 2.76 kg at the thirteenth percentile of estimated birth weight was delivered. Placental histopathology was unremarkable, and *Mycobacterium tuberculosis* bac terium was not detected in cultures taken from the placenta. After delivery, an MRI of the spine showed significant reduction of the lesion by 90% and improvement in the osteomyelitis. She continued anti-TB therapy for 12 months, with follow-up at the infectious diseases clinic. At her 16-month follow-up, her symptoms had improved and she returned to her normal daily activities. There were no complications arising from the gadolinium contrast use in the mother or toddler.

**Discussion**

Pott disease presents a diagnostic dilemma because of the relative infrequency of occurrence during pregnancy [3-5]. A possible differential diagnosis of Pott disease should be considered when pregnant patients present with neck and back pain. MRI (without gadolinium contrast) [12] and biopsy play important roles in the diagnosis of spinal TB in pregnancy. A multidisciplinary approach and anti-TB drugs can be considered with a careful workup, because of the possible risks for both the fetus and mother [3].

TB of the spine during pregnancy is rare [3-5]. Pain involving the neck and back in pregnant women should not be automatically regarded as benign, and delayed diagnosis and treatment of Pott disease during pregnancy can negatively culminate in adverse complications [9]. The related obstetric sequelae that have been documented in pregnancy with Pott disease include higher rates of spontaneous abortion, preterm labor, and increased neonatal mortality [9,13]. Several constitutional symptoms can take place gradually over an interval of weeks or months, such as persistent fever, night sweats, loss of appetite, and fatigue [3-5]. Nevertheless, close to 50% to 66% of pregnant women with TB are symptom-free because they have latent infection [3-5]. Nonspecific constitutional symptoms during pregnancy can phenocopy the physiological modifications that normally occur during pregnancy [3-5]. The symptoms of Pott disease can become obvious when the neural conduction within the spinal cord is interrupted [3-5].

Kaul et al reported the case of Pott disease in a 22-year-old pregnant woman who presented with poor lower limb mobility during her second trimester [10]. MRI showed a T2 lesion that was highly suspicious for spinal tuberculosis. In view of her progressive neurological disease, the patient underwent antepartum surgical decompression of Pott paraplegia, while maintaining her pregnancy during the second trimester. Postoperative biopsy confirmed Pott disease, and she was started on an anti-TB regimen. She delivered a healthy baby girl at 36 weeks of gestation by cesarean delivery. At 14 weeks after delivery, the patient recovered uneventfully without adverse events. Moreover, Srivastava et al reported the case of Pott disease in a 26-year-old pregnant woman during her second trimester who presented with acute spastic paraplegia including sphincter dysfunction [10]. Plain X-ray with abdominal shielding and MRI depicted a lesion at T5 that was highly suggestive of tuberculous spondylitis. Owing to the severity of the paraplegia and autonomic dysfunction, the patient underwent surgical decompression, and her neurological function was recovered. Nevertheless, the fetus experienced intrauterine demise 4 weeks after surgery. In the present case, the main symptoms were severe neck and back pain without paraplegia. In line with the recommendations reported in 2003 by the Infectious Disease Society of America, the United States Centers for Disease Control, and Prevention and the American Thoracic Society, a 4-drug protocol should be employed empirically to treat Pott disease [7]. Our patient was successfully...
treated with anti-TB therapy without any toxicity to the mother or fetus. Her symptoms completely subsided over time and she delivered vaginally at term without eventful outcomes.

The challenge in our patient was the soft tissue spinal mass which was identified through MRI. The differential diagnosis of a spinal mass mimicking a malignant tumor was not highly assumed. This was because the involvement of 3 consecutive thoracic vertebrae with intervertebral disc prompted us to highly consider a differential diagnosis of spinal pyogenic osteomyelitis or tuberculosis spondylitis. At the MRI level, several imaging parameters can highly differentiate between tuberculosis spondylitis (Pott disease) and pyogenic spondylitis. Compared with pyogenic spondylitis, tuberculosis spondylitis has higher rates of a well-defined paraspinal abnormal signal, thin and smooth abscess wall, occurrence of paraspinal or intraosseous abscess with rim enhancement, engagement of ≥3 vertebral levels, more likelihood of thoracic spine engagement, and hyperintense signal on T2-weighted diffusion images [14-16]. A multidisciplinary approach was obtained and biopsy taken by interventional radiologist-confirmed Pott disease.

MRI plays an important role in the diagnosis of spinal TB in pregnancy. A recent study showed that there was no significant difference between the contrast and non-contrast MRI in diagnosing Pott disease, and concluded that both techniques were equally effective [17]. In our study, we used post-gadolinium contrast T1-weighted imaging. However, T2-weighted diffusion imaging with a fat-suppression technique or short tau inversion recovery could have been sufficient for the diagnosis of Pott disease. This is because Pott disease is characterized by intrinsically hyperintense signals on T2-weighted diffusion images [14-16]. There is limited and inconclusive information on the safety of gadolinium-based contrasts on the fetus during pregnancy [18]. The use of gadolinium-based contrasts may be linked to concerns about neonatal death and several adverse events, but without certainty [12,18]. Hence, according to the American College of Obstetricians and Gynecologists, the general guideline is that gadolinium-based contrasts are not absolutely contradicted during pregnancy; however, they should only be used when the benefits outweigh the risks during pregnancy [12]. Moreover, the use of gadolinium-enhanced MRI during pregnancy should not suppress breastfeeding [12].

Conclusions

This report has highlighted how important imaging of the spine can be in the diagnosis of causes of severe back pain. This rare presentation of Pott disease in pregnancy has shown the challenges in diagnosis and the importance of a multidisciplinary approach to diagnosis and management so that treatment protects both the mother and fetus.

Department and Institution Where Work Was Done

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Declaration of Figures’ Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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