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CASE REPORTS

THIGH ABSCESS POST-VACCINATION – DO NOT FORGET TUBERCULOSIS!

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ABSTRACT

Injection site abscesses are common post-immunization complications, typically caused by pyogenic bacteria. Tubercular abscesses at injection sites are rare, with a few cases linked to *Mycobacterium tuberculosis* (MTB). We present a 2-year-old boy with progressive necrotic cervical lymphadenopathy for 1 year, left thigh swelling for 5 months, onset of which was 4 weeks after diphtheria-pertussis-tetanus vaccination at 16 months of age. He developed fever, purulent discharge from swelling and increase in swelling size 2 weeks prior to presentation. Ultrasound of thigh showed a thick-walled collection, suggestive of an abscess. Incision and drainage was performed, and pus detected rifampicin sensitive MTB-complex. Specific testing for *M. Bovis* was not done. Neck ultrasound showed necrotic cervical nodes and chest X-ray showed bilateral perihilar opacities. The child was previously vaccinated with Bacillus Calmette-Guérin in the left upper arm and had no known TB contacts. He was treated with incision and drainage of the abscess, followed by first-line anti-tubercular therapy with isoniazid, rifampicin, pyrazinamide, and ethambutol. At two months follow-up, ultrasound showed complete resolution of thigh abscess and non-necrotic cervical lymphadenopathy with reduction in node size. This case highlights the need for awareness of post-vaccination injection-site tubercular abscesses, particularly in children with an existing distant tubercular focus.

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Introduction

Injection site abscesses are common post-immunization complications. They are commonly pyogenic in nature, with the typical causative agents being *Staphylococcus aureus*, *Pseudomonas spp., Escherichia coli*, and *Klebsiella pneumoniae*.[1] Although *Mycobacterium bovis* and certain non-tuberculous mycobacteria, such as *M. chelonae and M. fortuitum*, have been commonly implicated in the causation of injection site abscesses, there exist only six cases of injection site abscesses caused by *M. tuberculosis* (MTB) reported in current literature.[1-6] We present a child with necrotic cervical lymphadenopathy who developed an injection site tuberculous abscess in the thigh following diphtheria-pertussis-tetanus (DPT) vaccination. Our case is unique as prior to the onset of the post-vaccination tubercular thigh abscess, the patient had an identifiable tuberculous focus in the cervical lymph nodes.

Case Report

A 2-year-old boy presented in May 2024 with persistent, progressive, bilateral neck swellings for 1 year and a swelling in the left thigh for 5 months. The thigh swelling appeared 4 weeks after intramuscular administration of the DPT vaccine booster dose at 16 months of age in the left anterolateral thigh. Over the past two weeks, he developed fever, weight loss, discharge from the thigh swelling, and a sudden increase in the size of the swelling. He had received the Bacillus Calmette-Guérin (BCG) vaccine in the left upper arm at birth. There was no contact with a tuberculosis (TB) patient. On presentation, his weight was 11 kg (between the 10th-25th percentile as per the Indian Academy of Pediatrics (IAP) growth chart), and his height was 90 cm (between the 75th-90th percentile as per the IAP growth chart). On examination, he had palpable, non-tender bilateral cervical lymphadenopathy. Other general and systemic examinations were normal. Ultrasound (USG) of the left thigh showed a thick-walled collection measuring 4.8x1.3x4.7 cm with a wall thickness of 2.6 mm, suggestive of an abscess. Incision and drainage of the abscess was done, and pus was sent for Xpert MTB/RIF Ultra, which detected MTB-complex, which was rifampicin sensitive. Specific PCR for *M. Bovis* was not done on the pus that was aspirated due to non-availability. Pus culture did not grow any organisms on aerobic culture. Gastric lavage Xpert MTB/RIF did not detect MTB. Chest X-ray (CXR) showed bilateral perihilar opacities. Neck USG showed necrotic cervical lymph nodes. Other investigations are shown in Table 1. Pus TB-MGIT culture grew MTB, and first-line LPA showed sensitivity to isoniazid and rifampicin. The patient was started on a first-line anti-tubercular therapy (ATT) regimen consisting of isoniazid, rifampicin, pyrazinamide, and ethambutol. Two months following the initiation of ATT, in July 2024, the patient presented with complete resolution of the thigh abscess and neck USG showed non-necrotic bilateral cervical lymphadenopathy with reduction in size of the nodes. The patient was shifted to continuation phase of ATT.

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Table 1: Investigations of the patient

Investigations	May 2024	July 2024	Reference Range
Hemoglobin (gm/dL)	10.8	10.5	11.5-15.5
White blood cell count (cells/cumm)	17,260	20,030	5000-13,000
Absolute lymphocyte count (cells/cumm)	1660	9785	1000-5000
Platelets (106 cells/cumm)	3.58	3.50	1.50-4.50
Erythrocyte sedimentation rate (mm/hr)	35	10	<10
HIV-ELISA	Non-reactive	-	-

Note: HIV- Human Immunodeficiency Virus, ELISA- Enzyme linked immunosorbent assay.

Discussion

Tubercular thigh abscesses, secondary to intramuscular injections, may be due to contaminated syringes.[7] Heycock et al.[7] reported four cases of primary TB thigh abscesses in children of the same hospital. All of these children had received multiple intramuscular injections from a nurse who had pulmonary TB. Sterile abscesses following immunization have also been reported to be due to adjuvants such as alum, 2-phenoxyethanol, and thimerosal present in certain vaccines, particularly the DPT vaccine.[8] Tubercular thigh abscesses have also been reported to be due to inadvertent BCG vaccine administration in the thigh.[9,10]

Tubercular thigh abscesses in children following immunization with vaccines other than BCG have been reported in a handful of cases. Out of the six cases we found in literature, four of them were following DPT vaccination, one following hepatitis B vaccination, and one following hexavalent vaccine administration (containing DPT and hepatitis B vaccines).[1-6] There was a latency between vaccination and the onset of the swelling ranging from 4 days to 4 weeks. Most patients presented with the isolated complaint of a progressive swelling at the vaccination site in the thigh.[1-6] Similarly in our patient, the thigh abscess was detected to be tuberculous 4 weeks after DPT vaccination. Since the culture grew MTB, BCGiosis was ruled out. However, since there was presence of necrotic cervical lymph nodes on USG of the neck and perihilar opacities on chest X-ray, it was more suggestive of disseminated TB.

USG of the thigh can be used to determine the size, location, and extent of the swelling and the presence of inguinal lymphadenopathy.[1-3,6] Underlying bone involvement can be determined on the X-ray of the pelvis and femur.[2,3,5,6] Needle aspiration followed by microbiological testing can be done to confirm the diagnosis.[1-6] Evidence of the administration of the BCG vaccine should be sought for, either through the presence of the characteristic scar or through a review of immunization records, to rule out inadvertent BCG administration in the thigh.[9,10]

Treatment of such cases involves medical management with ATT. The regimen used and the duration of the treatment are determined by the sensitivity status and the response to treatment.[1-6] Surgical management in the form of incision and drainage or needle aspiration may be done in cases that do not show a reduction in the size of swelling after starting ATT or in cases where recollection or an increase in the size of the swelling takes place.[1,2,5] The prognosis is good with complete resolution of the swelling, usually after 6 months of ATT.[1-6]

Conclusion

This presentation of a thigh abscess following DPT vaccination is unique, as our patient presented to us with a tuberculous abscess. The cervical nodes and perihilar opacities were picked up incidentally on screening for disseminated TB. Thus, we would like to highlight that one should also keep tuberculous abscesses post-vaccination in mind, apart from bacterial abscesses.

Compliance with Ethical Standards
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Conflict of Interest: None

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