

Cold abscess of thigh following inadvertent vaccination in an infant

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Abstract

Localized abscess in the same site of bacillus Calmette-Guerin (BCG) vaccine is a known complication. However, the occurrence of such abscess at other sites is uncommon. We, hereby, report a case of 4-month-old female child who developed a swelling at left thigh following intramuscular injection at 6 weeks vaccination. Aspiration cytology of abscess showed granulomatous inflammation and positivity for acid-fast bacilli. The exact etiology for this presentation is unknown; however, wrongful inoculation of the BCG vaccine in place of DPwT vaccine at 6 weeks could be suspected. *Mycobacterium* should be considered in any unexplained soft tissue abscess in areas of the world where tuberculosis is prevalent.

Key words: Cold abscess, Thigh, Vaccination

Local adverse reactions following intramuscular injection of vaccines are a common and localized abscess in the same site of bacillus Calmette-Guerin (BCG) vaccine is also known. However, the occurrence of such abscess at other sites is uncommon. We report a rare association between 6 weeks intramuscular vaccination and development of cold abscess possibly due to non-tubercular *Mycobacterium bovis* and discuss pertinent issues.

CASE REPORT

A 4-month-old female child (birth weight 3.1 kg) presented to our outpatient department with a swelling on the anterolateral aspect of her left thigh. This swelling appeared, for the first time, few days after receiving intramuscular vaccination in the left thigh, at the age of 6 weeks and was persisting till the time, child presented to us (Fig. 1). There was no history of fever, weight loss, or cough; and no history of contact with tuberculosis (TB) patient. Examination of the left thigh revealed a soft, fluctuant swelling of 3.5 cm × 1.5 cm in size; which was not warm, non-tender and non-pulsatile (Fig. 1). There was no joint restriction and no similar swelling at any other site. There was a BCG scar in the left upper arm and other systemic examination was unremarkable.

Laboratory test showed total leukocyte count of 11,800/mm³ (68% neutrophils, 32% lymphocytes); hemoglobin 12.1 g/dl; erythrocyte sedimentation rate 17 mm/h; C-reactive protein 10.8 mg/L; liver function test and coagulation profile were normal; blood culture was sterile and serology for HIV

was negative. X-ray of hip joint, thigh and spine showed no bony abnormality or any evidence of osteomyelitis. On further investigations (chest X-ray, gastric aspirate for acid fast bacilli (AFB) and ultrasound of abdomen, hip joint and cranium), no evidence of TB at any other site was found. Screening of caregivers for TB was also non-contributory. Child had received BCG vaccine at birth in left upper arm as per country's national vaccination schedule. Mantoux test (with 5 TU purified protein derivative) done on right forearm, showed induration of 9 mm after 72 h.

Fine needle aspiration cytological (FNAC) showed caseating granuloma suggestive of TB and staining for AFB was positive and culture from aspirate was sterile. Polymerase chain reaction for *Mycobacterium* TB was done, which was negative. Since the swelling and the disease did not progress in last 10 weeks, other investigations were not suggestive of progressive tubercular disease, and child was thriving very well; we presumed it to be non-tubercular *Mycobacterium*. Parents were reassured, no anti-tubercular therapy was advised and regular follow-up was planned. Swelling improved on follow-up and completely disappeared by 6 months of age without any specific treatment and child was growing well on follow-up at 1 year of age (Fig. 2).

DISCUSSION

In our country, BCG vaccination is given to all newborns at birth as per WHO recommendations [1]. Cold abscess refers to an abscess that lacks the intense inflammation usually



Figure 1: Soft tissue swelling in the left thigh at presentation



Figure 2: Soft tissue swelling in the left thigh at 1-year follow-up

associated with bacterial infections [2]. In developing world, TB still remains the most common cause for cold abscess. This usually follows involvement of adjacent bones and cold abscess of psoas muscle is generally one of the characteristic manifestations of spinal TB (Pott's spine) [3,4].

In our child, there was no evidence of TB of spine, thigh, pubis, or any other parts of body; there was a clear history of the appearance of swelling at the site of intramuscular DwPT injection. In context of AFB positivity and FNAC from swelling suggestive of TB, it was difficult for us to explain the origin of infection. A possible explanation could be inadvertent intramuscular administration of BCG vaccine at 6 weeks, in place of DwPT vaccination by vaccinator. Although we could not prove this, as vaccine at 6 weeks was received at another vaccination center.

On literature review, we could find out few case reports of development of tubercular abscesses following intramuscular injections in immunocompetent infants [5-9]. Such an abscess at the site of intramuscular injection could be either because of injection with syringe contaminated with *Mycobacterium*

tuberculi or because of inadvertent administration of BCG vaccine intramuscularly. Although culture from aspirate in our case was sterile, we could not prove whether it was because of syringe transmission of *M. tuberculi* from another case or *M. bovis* from BCG injection. Because of the availability of disposable syringes in the present era for every vaccination, possibility of contamination seems less likely. Tubercular infection at the site of injection following intramuscular BCG vaccination is given mistakenly in place of DwPT vaccination seems more likely in our case. Unfortunately, there are few similar case reports of inadvertent intramuscular injection of BCG vaccine to infants in past as well, where prolonged local reaction and swelling have developed [7,9,10]. Being a programmatic error, this should become a type of adverse event following immunization as per WHO definition.

Usually, no treatment is needed for non-*Mycobacterium* tuberculous infections in immunocompetent children. However, immunocompromised children or those having severe disease may need antibiotic therapy for 12-24 months. After aspiration, swelling decreased in our child and gradually disappeared without any anti-tubercular therapy. There is no consensus for the best management of this complication; although, healing might be prolonged without anti-tubercular therapy [7]. Our case indicates that any child who present with unexplained soft tissue swelling, accidental BCG injection causing tuberculous abscess should be considered in the differential diagnosis; especially, in those areas where children receive BCG vaccine in their immunization schedule. This case also highlights the possible adverse effects that could happen during vaccination and the need to address these issues.

CONCLUSION

Cold abscess at intramuscular injection sites following vaccination could be due to inadvertent administration of intramuscular BCG vaccine in infants. We wish to sensitize pediatricians and other medical fraternity about the possibility of such adverse reaction following vaccination, especially when adjacent joints and bones are normal.

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