

## TEACHING FILES (GRAND ROUNDS)

# IS IT BCGIOSIS OR DISSEMINATED TUBERCULOSIS?

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### ARTICLE HISTORY

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### Clinical Problem:

An 11 months old girl presented with gradually increasing left axillary swelling for which she underwent an incision & drainage of the pus 1 week ago. Pus wall histology showed granulomatous inflammation suggestive of tuberculosis (TB). Smear did not show acid fast bacilli (AFB). She was started on anti TB treatment (ATT) consisting of isoniazid (H), rifampicin (R), pyrazinamide (PZA), ethambutol (E). She had received BCG at birth. Seven months ago, she was detected to have left frontal hemorrhage with subdural extension due to late hemorrhagic disease of the newborn. She underwent craniotomy and evacuation of the subdural hematoma. Subsequently 2 months after craniotomy, she was detected to have meningitis [cerebrospinal fluid proteins 144 gm%, 780 cells/cumm (80% polymorphs, 20% lymphocytes) and sugar 43 mg%] for which she was treated with intravenous (IV) antibiotics. On presentation to us, her weight was 6.7 kg, total length was 65 cm and she had a left axillary discharging sinus. There was a pea size swelling over extensor aspect of left wrist. X-ray of hand was normal and ultrasound abdomen was normal. After 1 month, the swelling over left wrist increased and there was a new swelling of left elbow. Pus was drained from left elbow that showed AFB on smear. She also developed hepatomegaly. Her ATT in form of HRZE was continued and additional drugs in form of amikacin, PAS, Ofloxacin, clarithromycin and ethionamide were added, pending culture and drug sensitivity report. Workup for immune deficiency in form of HIV, lymphocyte subset analysis (CD<sub>3</sub>, CD<sub>4</sub>, CD<sub>8</sub>, CD<sub>19</sub>, CD<sub>16/56</sub>) serum immunoglobulins were normal. TB culture at end of 6 weeks did not grow any organism. Six months after ATT, amikacin was stopped. On completion of 1 year of ATT, her ATT was completely stopped. On her last follow up in April after 2 years of stopping ATT, she remained asymptomatic.

*Is this BCGiosis or disseminated TB?*

### Discussion:

Bacillus Calmette Guerin (BCG) vaccine primarily used against TB is administered to all infants at high

risk of TB immediately after birth. Its administration is often followed by mild side effects like redness, swelling and slight pain. Rarely, it may also be associated with serious complications, mainly in immunocompromised individuals which can be fatal.<sup>1,2,3,4</sup> Certain cases have also been reported in individuals with competent immunity, which is even rarer.<sup>5,6</sup> Complications may be benign, localized (BCGitis) or lethal disseminated (BCGiosis).<sup>7</sup> It may probably be due to immature immune system of the infant which does not react effectively against the vaccine or may also be due to malnourishment which compromises immunity.<sup>5,6,8</sup> Initially thought to be a disease of the infant, few cases have also been reported in older individuals, coinfecting with HIV virus or in cases of revaccination of individuals who were did not react to the first vaccination.<sup>9</sup> In a study conducted in Iran by Aelami et al, PCR has proven to be useful in the early and specific BCGiosis<sup>10</sup> which is essential for initiating an anti-microbial therapy at the earliest. Mycobacterium bovis is inherently resistant to pyrazinamide (PZA) and the use of HRE has found to be quite effective in its treatment.<sup>9</sup> In our patient, we continued PZA as we could not confirm whether the infection was because of BCG or Mycobacterium tuberculosis (MTB) as we did not do a PCR test. However, with swelling starting in the left axilla in infancy and history of receiving BCG in the left deltoid pointed towards a BCGiosis. ATT combination of HRZ has been found to be effective in the presence of a competent immunity and its success rate in immunocompromised hosts is low. Similarly, our patient did not respond to HRZE initially and had dissemination of the disease. It was only after additional drugs were added that the infection resolved. We could not test for mendelian susceptibility for mycobacterial diseases (MSMD) due to non-affordability, however since the child had no further infections after stopping ATT, it seems to be unlikely to be MSMD.

### Compliance with Ethical Standards

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Conflict of Interest: None

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