The Successful Management of a Rare Case of Disseminated BCG Infection with Anti-Tuberculosis Therapy

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Introduction

Disseminated BCG infection is a rare but significant complication of intravesical administration of BCG, a live attenuated strain of *Mycobacterium bovis (M.. bovis)* used in bladder cancer therapy. The infection typically spreads haematogenously through an inflamed or disrupted urothelium, often caused by traumatic catheterisation[1].

Systemic side effects are uncommon, as demonstrated by Lamm et al., who found that 95% of patients receiving BCG therapy experienced no adverse effects[2]. However, clinical manifestations can vary from localized symptoms such as cystitis, fever, and haematuria to systemic complications, including pneumonitis, hepatitis, and, as in this case, uveitis. These systemic presentations, if untreated, can lead to significant morbidity and mortality[3].

Ocular involvement is exceedingly rare, with only a few cases reported in the literature, describing uveitis, endophthalmitis, and conjunctivitis[4]. This case study explores the clinical presentation, diagnostic challenges, and therapeutic response of a patient with disseminated BCG infection (Fig 1a-c and Fig 2a-c), offering valuable insights for managing this rare but serious complication.

Case Presentation

A 78-year-old male presented to the eye casualty with acute vision loss in the right eye (hand movement only) accompanied by clinical signs suggestive of pan-uveitis following ocular trauma. He was started on topical steroids which did not resolve his symptoms.

Medical History

- Bladder cancer (diagnosed 3yrs prior on maintenance BCG therapy)
- Oesophagitis
- Hypertension
- Benign prostatic hyperplasia (BPH)

Medication

- Amlodipine
- Finasteride
- Tamsulosin

References

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3. Macleod LC, Ngo TC, Gonzalgo ML. Complications of Intravesical Bacillus Calmette-Guérin. Canadian Urological Association Journal. 2014 Aug 11;8(7-8):540.
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Investigations

Initial uveitis workup including:

- syphilis, HIV, Quantiferon, CMV, Hepatitis B, and C, ANA, ACE, and ESR returned negative.
- Vitreous biopsy revealed no growth.

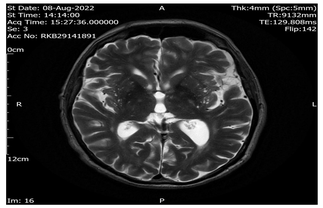


Fig 1a. MRI: Brain >100 small enhancing lesions throughout the brain parenchyma

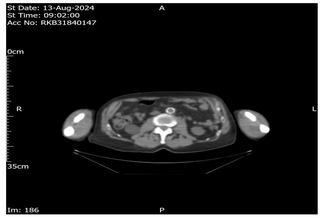


Fig 1b- PET scan: inoculated metabolically active retroperitoneal fluid collections or necrotic nodules

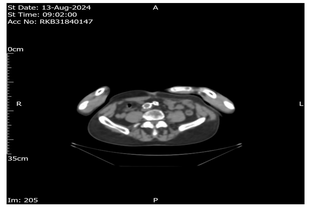


Fig 1c - PET scan: findings in line with an infection/ inflammation suggesting a mycobacterial infection

Outcome

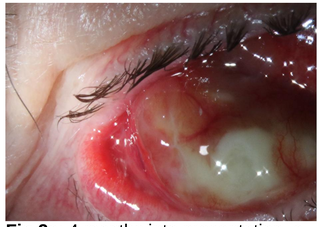


Fig 2a: 4 months into presentation, a new growth of inferior conjunctival soft tissue mass with a breech in right sclera wall inferiorly.

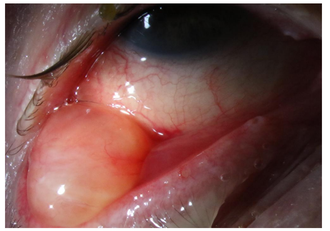


Fig 2b: 5 Months Post-Treatment: Significant reduction in the size of the right eye mass.

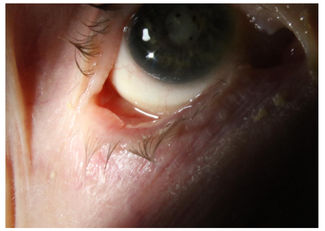


Fig 2c: Two years post anti-tuberculosis therapy. Phthisis eye

Findings from the MRI head and PET scan are suggestive of disseminated tuberculosis (TB) infection. Following an MDT discussion, anti-TB medications were initiated.

Discussion

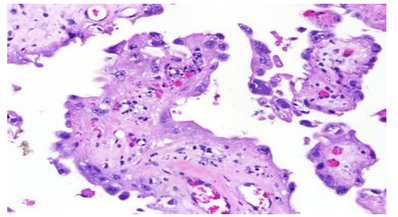


Fig 3. Ziehl-Neelsen stain used to identify *M. bovis.*

Pathogenesis:

- Haematogenous spread of *Mycobacterium bovis* occurs through inflamed and disrupted urothelium, typically due to traumatic catheterisation.

Diagnostic Challenges:

- Standard tests for *Mycobacterium tuberculosis*, such as Quantiferon, may yield negative results due to the attenuated nature of *M. bovis* in BCG[5].
- Histopathological examination may provide a more reliable diagnosis (Fig 3).

Clinical Manifestations:

- Localised symptoms include cystitis, fever, and haematuria.
- Systemic manifestations may involve pneumonitis, hepatitis, and, in this case, uveitis.
- Untreated cases carry risks of severe morbidity and mortality.

Management:

- Antituberculosis agents and corticosteroids form the cornerstone of treatment for disseminated BCG infections.
- Early diagnosis and initiation of therapy are critical for preventing complications.

Conclusion

The patient's right eye achieved comfort with the administration of anti-tuberculosis therapy. Although visual function could not be restored, the treatment effectively prevented further morbidity and mortality.

Recommendations

Maintain heightened clinical awareness of disseminated BCG infections, particularly in patients with non-specific idiopathic ocular symptoms and a history of BCG therapy.

- Prioritise early diagnosis and coordinated management to mitigate the risk of significant morbidity and mortality.
- Consider empirical anti-tuberculosis therapy when clinical suspicion is high, even in the absence of positive diagnostic test results.