CASE REPORT

BCG-osis following intravesical BCG treatment leading to miliary pulmonary nodules, penile granulomas and a mycotic aortic aneurysm

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SUMMARY

A 69-year-old male patient who was treated with intravesical BCG for carcinoma in situ of the bladder, went on to develop systemic features of BCG-osis. This diagnosis was supported by significant radiological and clinical findings. These systemic features include pulmonary miliary lesions, a mycotic abdominal aortic aneurysm and penile lesions. Owing to a breakdown in the relationship between the patient and the National Health Service, the patient has declined BCG treatment. This case highlights the potential rare side effects of intravesical BCG treatment and the risk associated with non-treatment of BCG-osis.

BACKGROUND

Intravesical BCG treatment for transitional cell carcinoma is a common treatment modality. While the chance of contracting BCG-osis following this treatment is low, the potential effects on patients are severe. One of the reasons the patient detailed here has subsequently refused antituberculosis (TB) treatment for his BCG-osis is due to the fact that he feels he was not aware of these risks prior to treatment, and thus has lost faith in his healthcare providers. By detailing the complications of intravesical BCG treatment on this patient, the author seeks to contribute to the evidence base for these rare side effects, and thus offer more information for patients and clinicians alike to make more informed choices regarding this treatment.

CASE PRESENTATION

A 68-year-old male patient presented to the National Health Service (NHS) with a privately obtained thorax, abdomen and pelvis CT report showing new multiple, bilateral, tiny lung parenchymal lesions (miliary). These were not present some 7 months earlier. This patient had previously been diagnosed with transitional cell carcinoma in situ of the bladder and had been treated with intravesical BCG. He also had an unrelated carcinoid tumour of the small bowel for which he had frequently arranged private radiological imaging to monitor the progression of his condition. The NHS staff are grateful to the patient for agreeing to share this radiological data.

A question was raised regarding the source of these lesions, and focused specifically on whether these could represent spread of the patient's carcinoid tumour. This was thought to be extremely unlikely for neuroendocrine cancer, which was known to have a

very slow growth rate. It was believed that a more likely cause for the patient's radiological findings was a rare side effect of the intravesical BCG treatment, namely pneumonitis caused by *Microbacterium bovis* due to BCG-osis. This was supported by the description from the patient of a sputum-producing cough, recent night sweats and weight loss while having intravesical BCG treatment. The patient at this point had terminated the treatment due to these side effects, and was feeling symptomatically better (subsequent histological analysis showed the treatment had eradicated the carcinoma). The patient had also ceased all his regular medication due to lack of faith in his doctors.

The patient presented to the dermatology clinic 2 months later with penile lumps. These were quite sore and affected only the glans. This presentation was ultimately determined to be penile granulomas, although no histological samples were obtained from the patient. It was thought by the dermatologists that these were likely to be a consequence of intravesical BCG treatment and thus represented a progression of the BCG-osis.

Six months after his original CT identifying the pulmonary miliary lesions, a subsequent CT scan showed new retroperitoneal soft tissue around the aorta. This also involved a 2.5 cm defect in the right lateral wall of the aorta and an associated 2 cm sacular aneurysm. This was subsequently successfully stented. After a review by the infectious disease team, it was determined that the likely diagnosis for this pathology was a mycotic aortic aneurysm.

INVESTIGATIONS

It is worth noting that multiple AAFB screens were performed on this patient and at no point were any positive results obtained. This could be due to the late presentation of the patient. It may be that there was no active BCG infection at the time of testing.

DIFFERENTIAL DIAGNOSIS

The patient was reviewed by the infectious disease team after having his stent placement, and the diagnosis of BCG-osis was considered sufficient to explain the above mentioned clinical and radiological findings in this patient.

TREATMENT

The treatment for BCG-osis would consist of an anti-TB regime of 2 months of rifampicin, isoniazid and ethambutol. This would be followed by 7 months of isoniazid and rifampicin. The patient declined this therapy.

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OUTCOME AND FOLLOW-UP

The patient continues to be monitored for an active BCG-osis and for his carcinoid tumour.

Six weeks after the aortic stent was inserted, the patient developed *Escherichia coli* bacteraemia which required further hospital stay. The patient also later developed a pyomyositis of the left leg/hip. The organism driving this infection was identified as *Fusobacterium nucleatum*. This organism was only identified through PCR analysis of materials biopsied from the patient's leg. This was performed after all other first-line bacterial screens had failed. This is a bacteria which normally only inhabits the human oral mucosa and gastrointestinal tract. It is unusual to find this organism as the source of a lower limb pyomyositis. A potential hypothesis is that these infections are secondary to the BCG-osis. However, it is unknown whether an active systemic BCG-osis modulates the host immune response to cause an immune compromise. It is also possible that this patient had an existing immunodeficiency that has not been identified.

Prior to the identification of the military pulmonary nodules, a right hepatic lobe lesion was also identified. It is highly likely that this represents a metastatic progression of the patient's carcinoid syndrome, which was partly due to the very slow growth of this lesion. No biopsies of this mass have been taken. As a result, there was some discussion by the infectious disease team as to whether this lesion may be a granuloma, which could be a symptom of the BCG-osis.

The patient had further progression of his carcinoid syndrome which led to bowel strictures, which in turn ultimately required surgery to avoid bowel obstruction. He had an ileostomy for some months, which has now been reversed.

DISCUSSION

Although rare, multiple cases of BCG-osis postintravesical BCG treatment have been detailed in the literature.^{1–3} While definitive diagnosis may only be available via histological examination of granulomatous tissue, clinical and radiological suspicion is often enough to warrant treatment with anti-TB therapy. This treatment has been demonstrated repeatedly to offer resolution to the clinical symptoms and radiological findings in these patients.

This particular case highlights a life-threatening complication of BCG-osis in the form of a mycotic aortic aneurysm, thus emphasising the severity of the potential side effects of intravesical BCG treatment for transitional cell carcinoma of the bladder. This case also highlights an important yet relatively benign complication in the form of penile granulomas. The potential psychosexual distress caused to the patient, and the resulting effect on the patient's social life is clearly an important issue.

The above factors, although rare, should be discussed with the patient prior to starting any intravesical BCG treatment. The

European Association of Urology advise that absolute contraindications for intravesical BCG treatment include: macroscopic haematuria, urinary tract infection and traumatic bladder catheterisation.⁴ It is essential that any potential systemic spread of BCG via the bladder is considered prior to therapy.

The patient detailed here felt that these potential side effects were not discussed with him previously. This author cannot comment on the content of the discussion prior to gaining consent for this procedure, but the patient had felt he had been ill informed. This feeling of not being informed about the potential complications of his treatment has contributed to the breakdown of this patient's relationship with his health providers. As a result, we have not been able to convince this patient that the anti-TB medication would be in his best interests. There may be further health problems for the patient as a result of this non-compliance.

Learning points

- ▶ Potential complications of BCG-osis postintravesical BCG treatment include: military pulmonary nodules, penile granulomas and mycotic aortic aneurysms.
- ▶ Offering patients information on rare but serious complications associated with treatment is essential to ensure future compliance with treatments. Specifically, offering patients undergoing intravesical BCG treatment information on BCG-osis is advised.
- ▶ BCG-osis diagnosis can be made using clinical and radiological findings in the presence of a negative AAFB screen (potentially signifying a non-active infection).

Competing interests None declared.

Patient consent Obtained.

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