ELSEVIER

European Journal of Radiology Extra 64 (2007) 5–9

EUROPEAN JOURNAL OF RADIOLOGY EXTRA

http://intl.elsevierhealth.com/journals/ejrex

Case report

Miliary tuberculosis induced by intravesical Bacille Calmette-Guerin (BCG) immunotherapy for bladder carcinoma: A case report

Ajay Varghese [a,1], Clive Vandervelde [a,*,1], Ahmed Liju [a,1], Hugh McIntyre [b,2], Anthony J. Dyson [b,2], Rita Joarder [b,2]

[a] *Guy's & St. Thomas' NHS Foundation Trust, St. Thomas' Street, London SE1 9RT, United Kingdom*
[b] *Conquest Hospital, East Sussex Hospitals NHS Trust, The Ridge, St. Leonards, East Sussex TN37 7RD, United Kingdom*

Received 8 January 2007; received in revised form 1 June 2007; accepted 24 July 2007

Abstract

We report an unusual case of an 82-year-old male patient with superficial bladder tumour who was treated with transurethral resection of bladder tumour followed by intravesical therapy with Bacille Calmette-Guerin (BCG). Two months after the last dose of BCG he presented with fever, weight loss and lethargy. Computed Tomography of the chest, abdomen and pelvis was performed to exclude metastatic disease. However, the lung appearances were suggestive of pulmonary tuberculosis and sputum culture subsequently grew Mycobacterium bovis, the same strain of mycobacterium as used in the intravesical BCG immunotherapy. Antituberculous chemotherapy was commenced but unfortunately the patient developed deep vein thrombosis and died within a few days of starting antituberculous chemotherapy. Multiple studies have demonstrated that transurethral resection of the transitional cell carcinoma followed by intravesical instillation of BCG in the treatment of and prophylaxis against recurrent stages Ta and T1 tumours and carcinoma in situ significantly reduces recurrence and prolongs disease free survival. Toxic side effects of BCG immunotherapy can be divided into local and systemic. Local side effects include cystitis, haematuria, bladder contracture, prostatitis, epididymo-orchitis, ureteral obstruction and renal abscess. Systemic side effects include fever, malaise, pneumonitis, hepatitis, rash, arthralgia, cytopenia and sepsis. The combination of miliary tuberculosis diagnosed on CT and confirmed by sputum culture in such a patient is very unusual. As in other similar cases, Maximum Intensity Projection (MIP) manipulation of the Computed Tomography images helped in the detection of the abnormalities.

Keywords: Tuberculosis; Bacille Calmette-Guerin; Bladder cancer; Intravesical

1. Introduction

We report a case of an 82-year-old man who developed miliary tuberculosis 2 months after completing a course of intravesical Bacille Calmette-Guerin (BCG) therapy for transitional cell carcinoma of the bladder. The diagnosis was made by a combination of Computed Tomography (CT) of the lungs and sputum culture. We discuss the current use of intravesical BCG and the documented local and systemic side effects. We also discuss the benefits of using Maximum Intensity Projection (MIP) manipulation of CT images to aid detection of small pulmonary nodules.

2. Case report

An 82-year-old man was admitted to hospital in June 2006 for evaluation of weight loss and lethargy of 2 months duration and recent onset of low-grade fever. Twenty-four months prior to this admission he was diagnosed with pT1 transitional cell carcinoma (TCC) of the urinary bladder along with

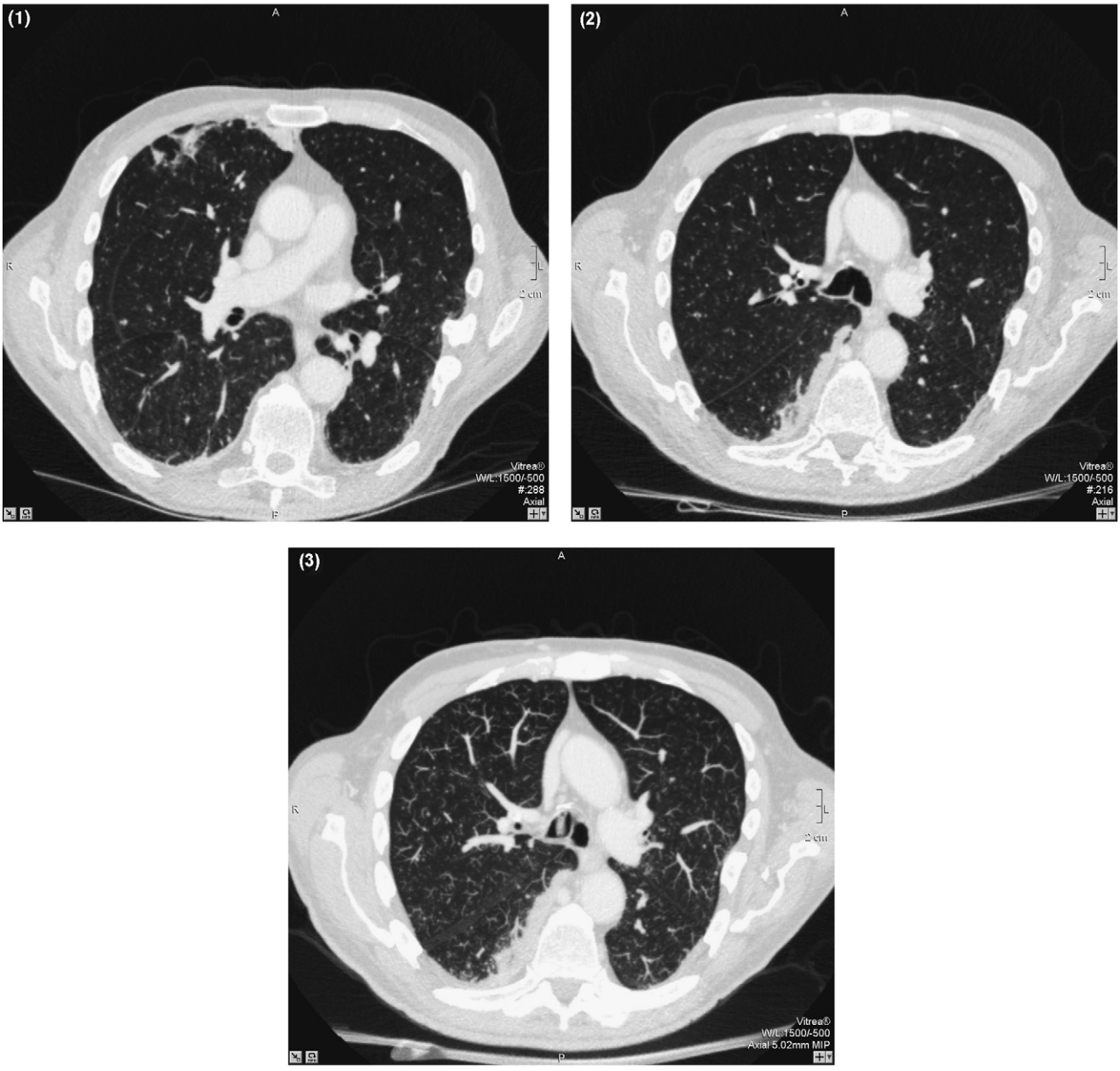
* Corresponding author at: Flat 9 Langthorne Lodge, 4 Charles Haller Street, London SW2 2YN, United Kingdom. Tel.: +44 7818 045203.
E-mail addresses: vargheseajay@hotmail.com (A. Varghese), clivevandervelde@gmail.com (C. Vandervelde), Ahmed.Liju@gstt.nhs.uk (A. Liju), Hugh.McIntyre@esht.nhs.uk (H. McIntyre), Anthony.Dyson@esht.nhs.uk (A.J. Dyson), Rita.Joarder@esht.nhs.uk (R. Joarder).
[1] Tel.: +44 2071887188.
[2] Tel.: +44 1424 755255; fax: +44 1424 758008.

1571-4675/$ – see front matter © 2007 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ejrex.2007.07.005

concurrent carcinoma in situ. Following transurethral resection of the bladder tumour, he was treated with intravesical instillation of BCG. This was delayed because of urethral stricture, which required dilatation. One week following urethral dilatation he started a course of weekly instillation of intravesical BCG (ImmuCyst 81 mg lyophilized powder with diluent for reconstituition, Aventis Pasteur Limited) for 6 weeks, commencing in November 2004. The reconstituted product contained $10.5 \pm 8.7 \times 10^8$ colony forming units per instillation dose. This was followed, after a 3-month break, by monthly instillations of BCG for 6 months. After the sixth dose the patient was admitted for a brief period with macrohaematuria, which settled spontaneously, and two further monthly installations of BCG were then administered after a 3-month gap. The last dose was given in April 2006 and a subsequent cystoscopy and biopsy showed a good response.

On admission in June 2006, the patient had a mild normocytic anaemia and slightly elevated inflammatory markers. There was moderate renal impairment but liver function tests were normal. Urine examination showed scanty red blood cells and few white blood cells with no bacterial growth.

Chest radiograph was normal. At this stage, the patient was referred for CT of the abdomen and pelvis to rule out recurrent TCC, metastatic disease or other malignancy. It was also decided to include the chest at the time of scanning and volume acquisitions were performed. This was done



Figs. 1–3. Selected CT slices (lung windows) showing peripheral consolidation and tiny miliary nodules in a random distribution. Images shown are before (Figs. 1 and 2) and after (Fig. 3) post-processing with Maximum Intensity Projection (MIP) protocol. The nodules are better appreciated using MIP.