

Infectious Thoracic Aortic Aneurysm after Intravesical *Bacillus* Calmette-Guerin Instillation Therapy

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Abstract

Intravesical *Bacillus* Calmette-Guérin instillation therapy after transurethral resection of bladder tumor is considered as the most effective treatment for prophylaxis against the recurrence of high-risk, non-muscle bladder cancer. However, intravesical *Bacillus* Calmette-Guérin instillation therapy has some characteristic complications. Here, we report a case of infectious thoracic aortic aneurysm related to prior intravesical *Bacillus* Calmette-Guérin instillation, which consequently allows the spread into the adjacent lung tissue and secretion in sputum of *Mycobacterium bovis*.

We report a case of infectious thoracic aortic aneurysm related to prior intravesical BCG instillation, which consequently allow the spread into the adjacent lung tissue and secretion in sputum of *M bovis*.

Keywords: *Bacillus* Calmette-Guerin; Infectious thoracic aortic aneurysm; Intravesical instillation; *Mycobacterium bovis*; Sputum

Abbreviations

BCG: *Bacillus* Calmette-Guérin; TURBT: Transurethral Resection of Bladder Tumor; CT: Computed Tomography; TEVAR: Thoracic Endovascular Aortic Repair; *M.bovis: Mycobacterium bovis*

Description

An 80 year old man presented to our hospital because of gross hematuria. Cystoscopy and TURBT revealed carcinoma in situ of the bladder. Three weeks later from the TURBT, he was given 80 mg BCG intravesical instillations every week for eight weeks. Two weeks later from the last treatment, he had suffered from long-lasting fever and poor appetite, and lost 10 kg in three months from the last BCG intravesical instillation. In addition to the lack of definitive evidence of BCG dissemination, because of spontaneous improvement of the symptoms, observation without treatment was adopted at that time. Ten months later from the intravesical instillations, he developed bloody sputum. CT revealed an infiltrative consolidation to his upper lung and *M.bovis* was detected from his sputum by polymerase chain reaction. Under the diagnosis of pulmonary infection of M.bovis, medical therapy for tuberculosis (Isoniazide, Rifampcin, and Ethambutol) was started. After ten months of medical therapy for tuberculosis, there was no improvement in chest X-ray examination. CT revealed an infectious thoracic aortic aneurysm with air in the vascular wall, and he was diagnosised with tuberculous infectious thoracic aortic aneurysm. He was treated with Thoracic Endovascular Aortic Repair (TEVAR), and antibiotic therapy was continued. There was no recurrence at 24 months after treatment with TEVER.

BCG immunotherapy after TUR is the gold standard treatment for non-muscle-invasive bladder cancer (stage pTa, pT1, pTis) [1]. Owing to the presence of viable mycobacteria, several adverse reactions such as fever, hematuria, and lower urinary tract symptoms have been reported [2]. On the other hand, rare cases of serious complications, such as interstitial pneumonitis, military *tuberculosis*, hepatitis, sepsis, and infectious aortic aneurysm have been reported [3,4]. Among this ectopic dissemination of BCG, infectious aneurysm is a relatively rare entity. The infectious aortic aneurysm often has a long time of onset from BCG therapy, and the mean time is approximately 25 months [5]. This long latency of *Mycobacterium* in the aortic wall might make the diagnosis difficult. Lamm recommend that if the fever greater than 38.5 prolongs for more than 24 hours after BCG instillations, initial treatment should be aggressive and utilize isoniazid [3]. Witjes et al. also recommend prompt treatment for persistent fever (>38.5°C for >48 hours) with two or more antimicrobial agents (Fluoroquinolones, isoniazid, and rifampicin) before the diagnosis of the disseminated BCG infection [6].

It was reported that the mean growth rate of the aortic aneurysm was 0.12 cm/year [7]. Therefore, several factors such as infection of the aortic wall should be considered in this case of the rapid growth of the aneurysm. Considering the negative blood culture results, the infiltrative consolidation to the lung adjacent to the aneurysm and the detection of *M.bovis* from the sputum, this case may be an infectious aortic aneurysm caused by the disseminated BCG infection.

In our case, bacteria were disseminated hematogenously and colonized his blood vessel wall during continuous mild fever and anorexia after BCG therapy. Retrospectively, the lack of therapeutic intervention at this latent period might facilitate successive aneurysmal formation and invasion of pathogen to the adjacent lung tissue. Therefore, in addition to the prevention of dissemination, urologists should be aware of the possibility of long-lasting latency of ectopic infection of *M.bovis* such as the case of aortic wall, for the appropriate therapeutic intervention.

Conclusion

Infectious aneurysm caused by *M.bovis* is one of the complications, which has difficult diagnosis because of its long latency. Every urologist should be aware of how to manage this rare complication, to prevent epidemiologic consequence.

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Received date: March 02, 2021; Accepted date: March 17, 2021; Published date: March 24, 2021

Citation: Koterazawa S, Watanabe J, Uemura Y, Uegaki M, Shirahase T et al. (2021) Infectious Thoracic Aortic Aneurysm after Intravesical *Bacillus* Calmette-Guérin Instillation Therapy. J Infect Dis Ther 9:453.

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