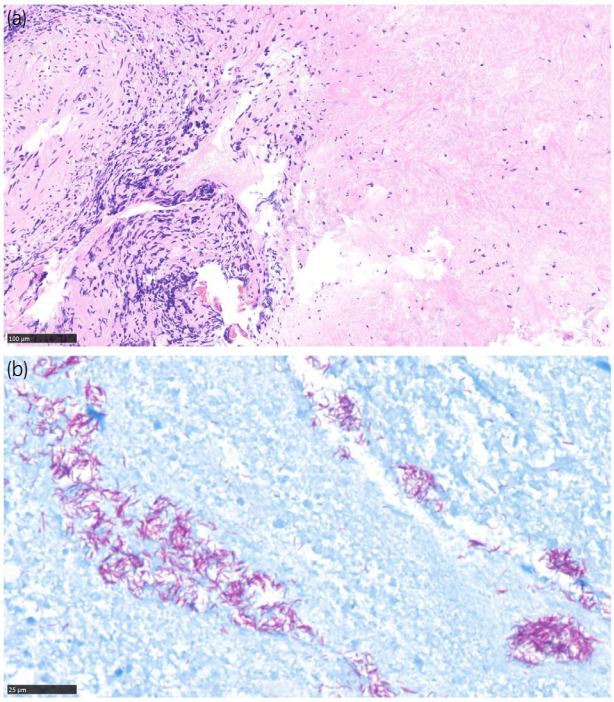

Fig. 2 Pathological findings. (a) Hematoxylin and eosin staining reveals caseating granuloma in bladder biopsy specimen. The bar indicates 100 μm. (b) Ziehl–Neelsen staining revealed collection of acid-fast bacillus. The bar indicates 25 μm.

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Conflict of interest

The authors have no conflict of interest to declare.

Approval of the research protocol by an Institutional Reviewer Board

This report was approved by the Ethics Committee at the University of Tokyo Hospital (Approval number: 3124). Informed consent to participate was obtained from the patient.

Informed consent

Written informed consent was obtained from the patient for publication of the details of this medical case and any accompanying images.

Registry and the Registration No. of the study/trial

Not Applicable.

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Editorial Comment

Editorial Comment to A case of miliary tuberculosis following transurethral surgery and prostate biopsy after intravesical bacillus Calmette-Guerin immunotherapy

Intravesical bacillus Calmette–Guerin (BCG) therapy is standard therapy for T1 high-grade high-risk non-muscle-invasive bladder.[1,2] Although miliary tuberculosis after BCG therapy is rare (<1%),[3] it could be life-threatening. Yoshiaki *et al.* reported miliary tuberculosis defined by transurethral surgery and prostate biopsy specimens.[4] This is an informative study reporting the risk of developing systemic tuberculosis after intravesical BCG. Some reports suggest that BCG may persist in the bladder for a long time and cause late-onset BCG infection.[5] A previous study reported that BCG PCR from bladder biopsy was positive in 23.8% (5 of 21 biopsies) at 9 months and 4.2% (1 of 25 biopsies) at 12 months after the final BCG instillation.[5] Although the number of patients was

limited, we should know that the risk of systemic infection might be not negligible after intravesical BCG therapy.

The key point that we need to learn from this case is how to avoid such an unusual incidence. According to the present case, urine BCG PCR might be an option for patients (i) who need to undergo an invasive procedure and (ii) who had persistent aseptic pyuria. Although urine BCG PCR test is not included in clinical practice, it might be helpful to recognize the risk of severe systemic tuberculosis after BCG therapy.

The association between BCG persistence and antitumor response is not known. BCG persistence in the bladder for a long time may cause late-onset BCG infection but that may cause a long-term durable response. Further study is necessary to address the long-term persistence of BCG may be beneficial or harmful for the patient with high-risk non-muscle-invasive bladder.

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