

# Malacoplakia of the bladder combined with infected renal calculi: A case report

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## Case Report

**Keywords:** malacoplakia of the bladder, transurethral resection, urinary tract infection, renal calculi, case report

**Posted Date:** April 25th, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1553810/v1>

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# Abstract

**Introduction:** The malacoplakia of the bladder is a rare chronic acquired infection- associated granulomatous disease and even less common in combination with urinary stones.

**Case Presentation:** We report the case of a 58-year-old female patient with malacoplakia of the bladder combined with renal calculi. The patient was admitted to the hospital with bilateral low back pain for one month and space-occupying lesions of the bladder for three days. Preoperative imaging suggested space-occupying lesions of the bladder: high probability of bladder cancer. Following the anti-infection treatment, the transurethral electrodesiccation was performed on the space-occupying lesions of the bladder. Pathological examination confirmed the diagnosis of malacoplakia of the bladder. Left-sided percutaneous nephrolithotomy was performed electively to remove the predisposing factors of infection. After the operation, the patient continued to receive anti-infection treatment for two months. The patient had a good prognosis in the six-month follow-up.

**Conclusions:** Malacoplakia of the bladder is easily misdiagnosed as bladder cancer before operation, and the diagnosis depends on pathological diagnosis. Complete removal of urinary calculi, infection and other inducing factors, is beneficial to the treatment of malacoplakia of the bladder.

## Background

Malacoplakia, a rare chronic acquired infection-associated granulomatous disease, also known as Von Hansemann's disease, was first reported by Michaelis and Gutmann in 1902<sup>[1]</sup>. Malacoplakia may affect any organ but frequently occurs in the genitourinary system, especially the bladder<sup>[2]</sup>. Malacoplakia usually presents as a solitary tan plaque or nodule that can be easily confused with bladder tumors<sup>[3]</sup>, which must rely on pathologic examination for a final diagnosis. At present, only a few cases of malacoplakia combined with urinary stones have been reported. We report here a case of malacoplakia of the bladder combined with a stone in the left infrarenal calyx and reviewed relevant literature.

## Case Presentation

### General data

A female patient, 58 years old, farmer, married, menopausal.

### Complaint

Bilateral low back pain for more than one month, and space-occupying lesions of bladder found for three days.

## History of present illness

One month prior to admission, the patient had persistent bilateral lumbar swelling with pain for no apparent cause, which was relieved at rest. No visual hematuria or fever was observed. CT examination of the whole abdomen suggested multiple stones in both kidneys complicated with mild hydronephrosis. The space-occupying lesions of the bladder were detected, and bladder cancer was considered. No prolonged fever and no weight loss were observed.

## Previous history

The patient had pain at the end of urination with interrupted urination for six months. Two years ago, both kidney stones were removed by right nephrectomy and left percutaneous nephrolithotomy, and the patient had a history of hypertension for six months.

Physical examination: T: 36.5, P: 59 beats/min, R: 18 beats/min, BP: 110/77 mmHg (maintained with antihypertensive medication). The patient's abdomen was flat and soft, with a 6-cm surgical scar on the right lumbar region (incisional lithotomy) and a 1-cm surgical scar on the left lumbar region (percutaneous nephrolithotomy). There was no percussion pain in both kidney and ureteral stroke pressure, and no abnormality of external genitalia was observed.

Laboratory examination: Urine routine: 249 red blood cells/ $\mu$ L, urinary nitrite +, urinary leukocytes +++, fasting blood glucose: 8.05 mmol/L and glycosylated hemoglobin: 7.5%. No malignant cells were seen in urine-based cytology for three consecutive days. Urine culture and drug sensitivity: *Escherichia coli*  $> 10^5$ , sensitive to piperacillin and cotrimoxazole, levofloxacin as an intermediary agent.

## ***Imageological examination:***

(1) *Computerized Tomography (CT) report:* Space-occupying lesions of the bladder, high probability of bladder cancer, multiple stones in both kidneys, cysts in both kidneys, and mild hydronephrosis in the right kidney. A cauliflower-shaped soft tissue density nodular shadow (Fig. 1) was seen in the right posterior lower wall of the bladder.

(2) *Magnetic Resonance Imaging (MRI) report:* The space-occupying lesions of bladder neck: high probability of bladder cancer. The involute papilloma was to be removed. T1WT1 image (Fig. 2A) and STIR images (Fig. 2B) showed cauliflower-like soft tissue signal nodular shadow (white arrow) in the posterior bladder wall.

Preoperative diagnosis: 1. The space-occupying lesions of bladder: bladder cancer? 2. Multiple stones in both kidneys; 3. Urinary tract infection; 4. Hypertensive disease grade 3, high-risk group; 5. Type 1 diabetes mellitus

## Diagnosis and treatment

the patient was given 4.5 piperacillin (IV, q8 h) preoperatively for anti-infection for one week, and the recheck revealed that nitrite was converted to negative in the urinary routine. On April 27, 2021, the transurethral bladder mass electrosurgery was conducted under combined spinal and epidural analgesia (with surgical pictures shown in Fig. 3).

Pathological diagnosis of specimen after electrodesiccation: Bladder malacoplakia (Fig. 4).

Immunohistochemistry (Fig. 5): CK-pan (surface epithelial +), GATA-3 (surface epithelial +), CD68 (histiocytes +) Ki67 (+).

## Percutaneous nephroscopy:

The ultrasound-guided left percutaneous nephrolithotomy (PCNL) was performed under general anesthesia, and the postoperative kidney-ureter-bladder (KUB) showed that the stone was removed (with KUB pictures shown in Fig. 6). Bacterial culture of the extracted left kidney stone indicated a large number of *E. coli*, a small number of fecal alkaline-producing bacilli, and the drug-sensitive results were consistent with the urine culture. Analysis of stone composition revealed calcium oxalate monohydrate, calcium oxalate dihydrate, carbapatite, and ammonium magnesium phosphate hexahydrate (infected stone).

## Follow-up

After discharge, the patient was given oral cotrimoxazole (0.96 BID) for one month, and the urinary routine was normal on recheck. The Double J ureteral stent was removed one month after surgery, and microscopic examination revealed that the multiple spotted bladder lesions were less severe than before. She was advised to take levofloxacin for one month. At follow-up to date, the patient had a good prognosis with no discomfort, and cystoscopy showed no bladder mass and erythema lesions of bladder mucosa basically disappeared.

## Discussion

The malacoplakia of the bladder is common in middle-aged adults, with a male to female ratio of 1:4<sup>[4]</sup>. The main etiologies are bacterial microbial infection, defective immune response<sup>[5]</sup>, and abnormal macrophage function<sup>[6]</sup>. This disease usually occurs in immunocompromised individuals, with *E. coli* being the most common pathogen. The malacoplakia of the bladder combined with yellow granulomatous cystitis has been reported previously<sup>[7]</sup>. Cases of bladder stones in combination with malacoplakia of the bladder have been reported earlier<sup>[8]</sup>, and in this case, the patient had diabetes mellitus and renal stones with recurrent urinary tract infections. Urine culture suggested *E. coli*. Patients

with malacoplakia of the bladder present clinically with symptoms of bladder irritation, or with vague pain and hematuria. Bilateral ureteral obstruction as a result of malacoplakia of the bladder<sup>[9]</sup>. In this case, the lesion was located in the inner orifice of the bladder neck urethra, producing a piston-like action, and interruption of urination occurred.

The imaging and cystoscopic presentation of bladder chondromalacia resemble that of a bladder occupying lesion, and at the initial diagnosis, it is mostly considered to be a bladder tumor. Superficial bladder mucosal lesions need to be differentiated from bladder carcinoma in situ, adenocystitis, and other diseases. Pathological examination is the gold standard for the diagnosis of this disease. In this case, the clinical diagnosis of bladder cancer was proposed, and the final pathology confirmed the diagnosis, with typical Michaelis-Gutmann microcystes seen on pathological examination.

Malacoplakia is a relatively rare chronic granulomatous inflammatory disease with a good prognosis but is prone to recurrence. The treatment often varies based on the predilection site, disease severity, and clinical presentation of patients. Currently, there is no standardized treatment available. Regular and effective anti-infective treatment can control the disease, and quinolones are the primary drugs for current treatment, which can improve the survival rate of patients<sup>[10]</sup> and be used at low doses for a long time to prevent a recurrence<sup>[11]</sup>. For obvious occupancy or when antibiotic treatment is ineffective, the best solution seems to be surgery combined with antibiotic treatment<sup>[6]</sup>. In this case, after preoperative anti-infective treatment, the transurethral electrodesiccation was performed on the bladder mass. Another elective left PCNL was performed to manage the renal stone and aggressively remove infection triggering factors. The patient who adhered to anti-infective treatment after discharge had a good prognosis in the six-month follow-up. Collectively, this case suggested that thorough treatment of urinary stones and urinary tract infections, together with electrodesiccation of the bladder in possession, which is beneficial in the treatment of malacoplakia of the bladder.

## Conclusions

Malacoplakia of the bladder and bladder cancer are easily confused in preoperative imaging diagnosis, and easily misdiagnosed as bladder tumor at initial diagnosis, so we must rely on pathological examination to make the final diagnosis. For the treatment of malacoplakia of the bladder, regular anti-infective treatment can be given before surgery, and then combined with PCNL, it can effectively treat the malacoplakia of the bladder.

## Abbreviations

CT: Computerized tomography; PCNL: Percutaneous nephrolithotomy; KUB: Kidney -ureter-bladder; MRI: Magnetic resonance imaging.

## Declarations

## Competing interests

The authors all declare that they have no competing interests.

## Ethics approval and consent to participate

The ethics committee of the Second Affiliated Hospital, Hengyang Medical School, University of South China approved the study.

## Consent for publication

Written informed consent was obtained from the patient of this case report.

## Availability of data and material

Not Applicable.

## Acknowledgements

We would like to acknowledge the reviewers for their helpful comments on this paper.

## Funding

This work was financially supported by the Scientific Research Project of Hunan Provincial Health Commission (No.B2019112).

## Authors' contributions:

QH and WX performed the surgery; YW, XC, BX, XZ and BW collected the patient clinical data; YF performed pathological testing of the biopsy sample; SL provided imaging data; QH drafted the manuscript and WX reviewed and approved the final manuscript. All authors have reviewed the final draft and approved the article.

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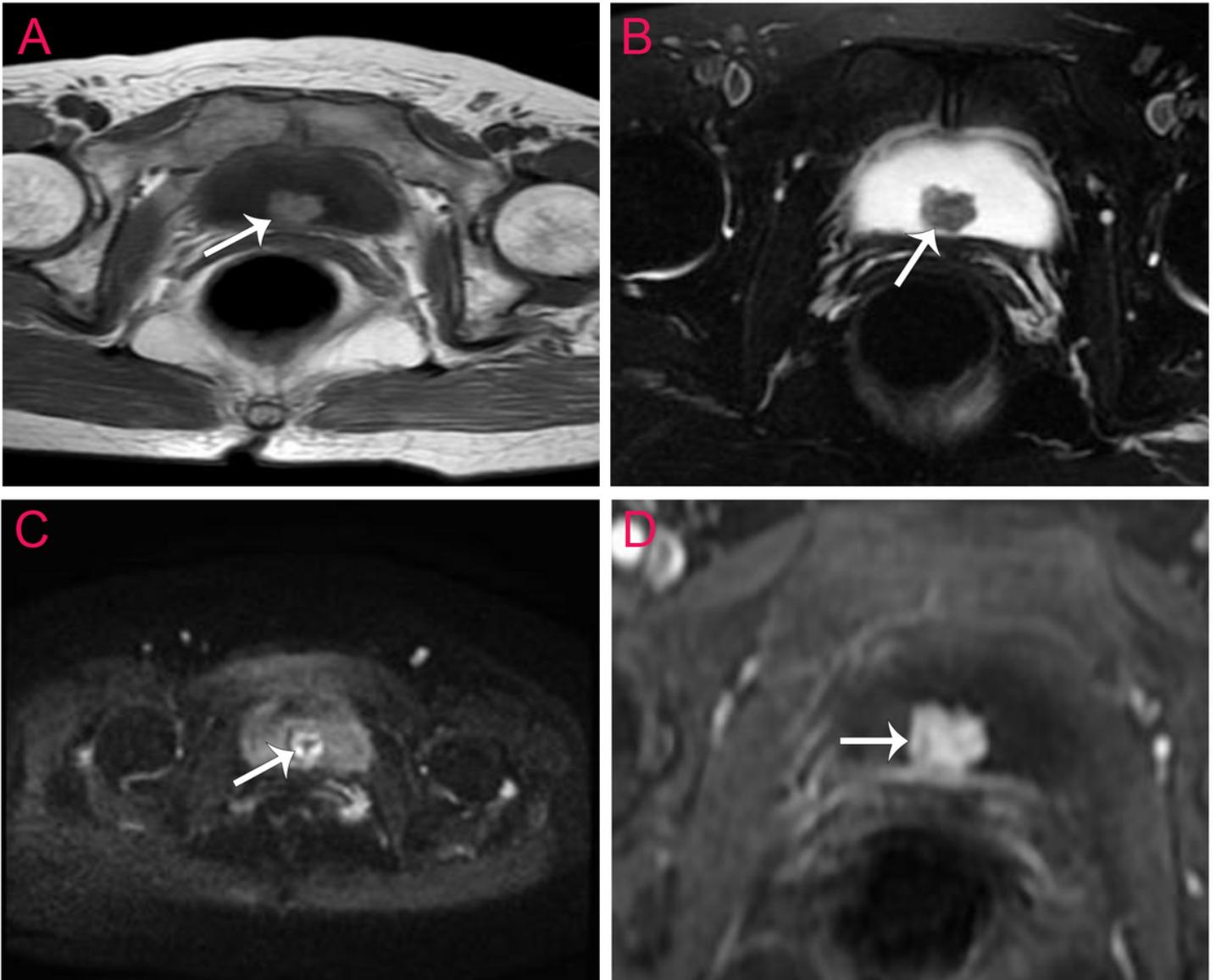
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## Figures



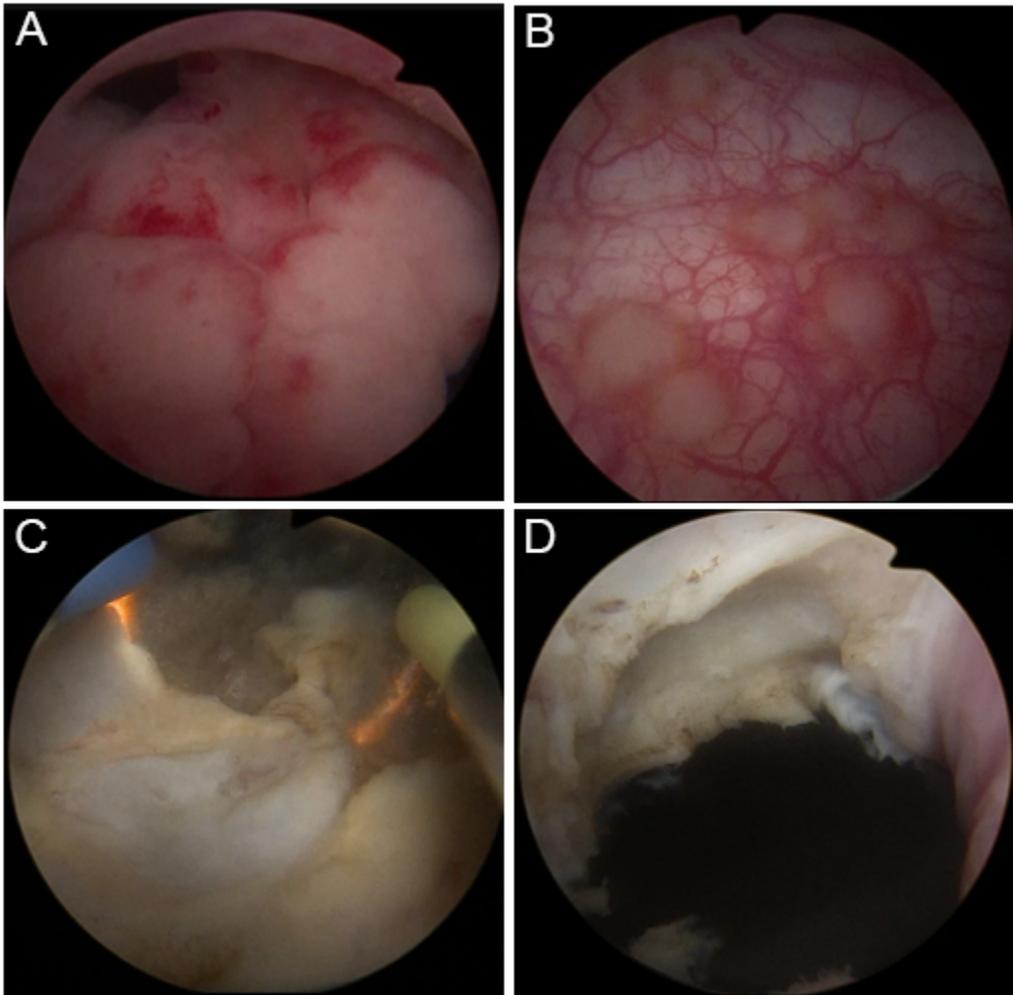
## Figure 1

(A-C) A cauliflower-shaped soft tissue density nodular shadow (white arrow) was seen in the right posterior lower wall of the bladder, measuring approximately 12 mm × 11 mm × 11 mm, with a wide base attached to the bladder wall and an irregular morphology. (D) Enhancement scan, computed tomography urography (CTU) showed a soft tissue density filling defect in the right posterior lower wall of the bladder.



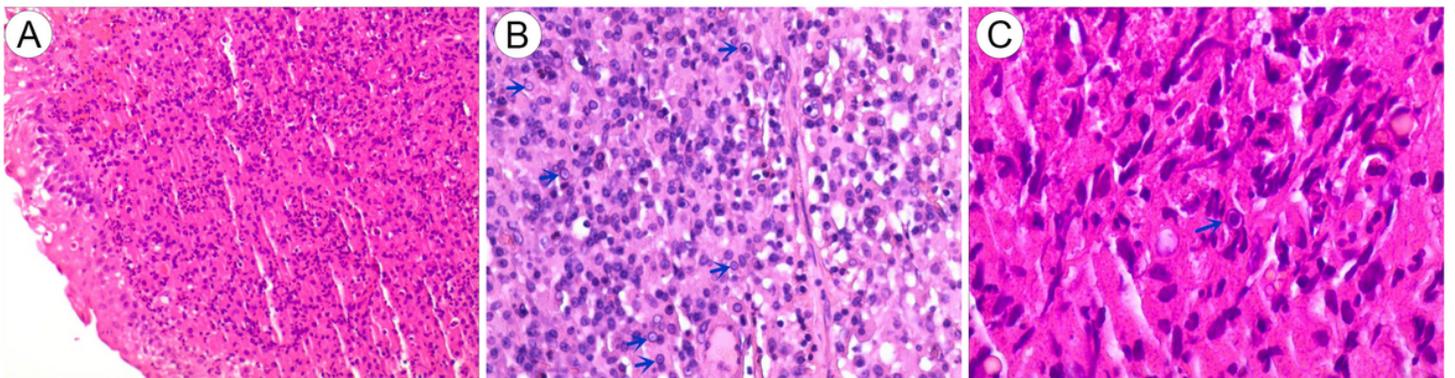
## Figure 2

T1WT1 image (A) and STIR images (B) showed cauliflower-like soft tissue signal nodular shadow (white arrow) in the posterior bladder wall, which was isosignal compared with that of the muscle. It had a wide basal connection with the bladder wall. High signal nodular shadow on DWI (C), with significant inhomogeneous enhancement on enhancement scan (D).



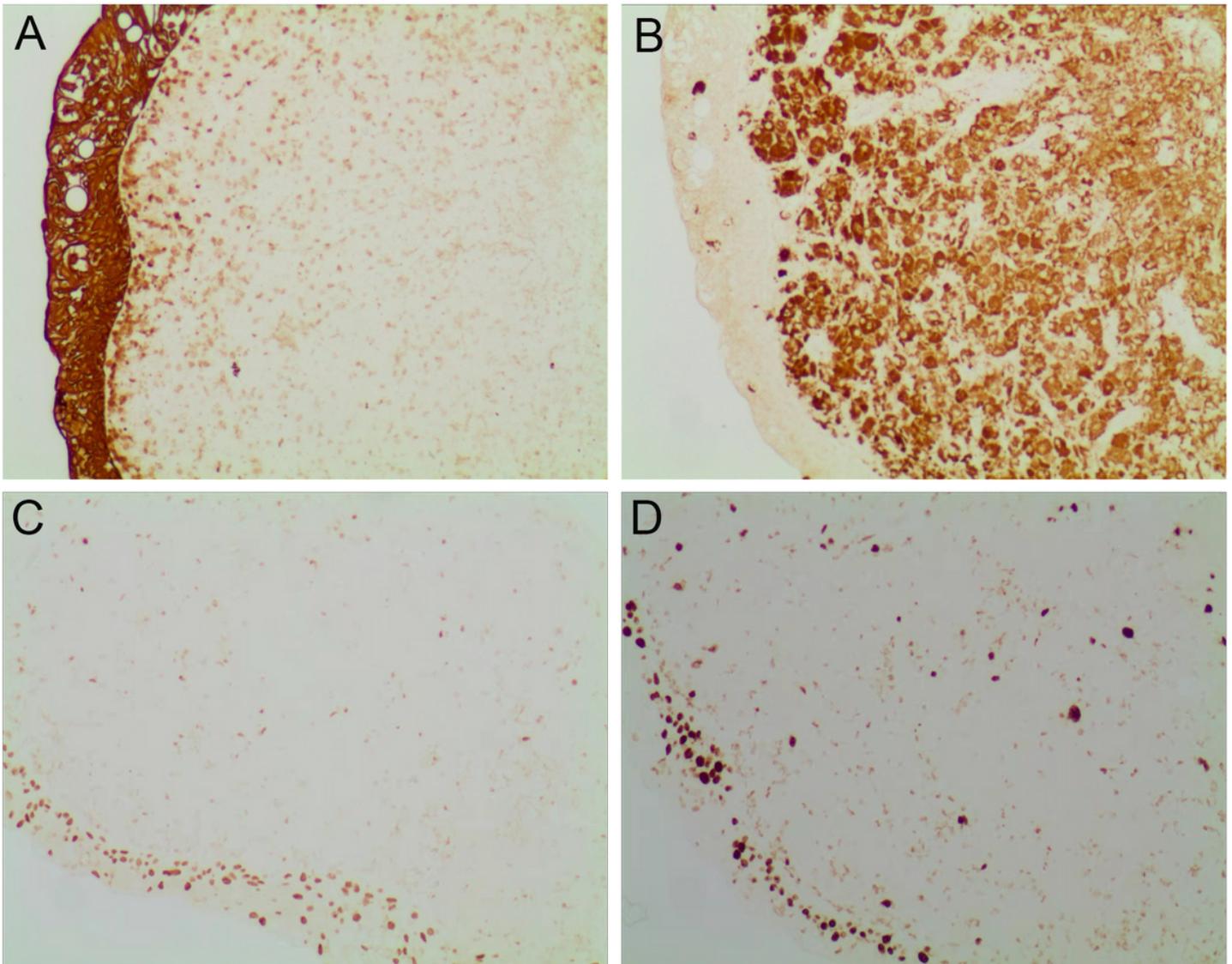
**Figure 3**

(A) A mass with smooth surface mucosa and irregular shape was observed at the internal urethral opening of the bladder neck. (B) Extensive multiple superficial mucosal red velvet-like lesions were seen in the bladder and random biopsies were taken. (C) Plasma electrode section of the mass with a tough texture and rich blood supply was performed, and all the excised specimens underwent pathological examination. (D) Complete excision of the mass reaching the superficial layer of the internal sphincter of the bladder neck.



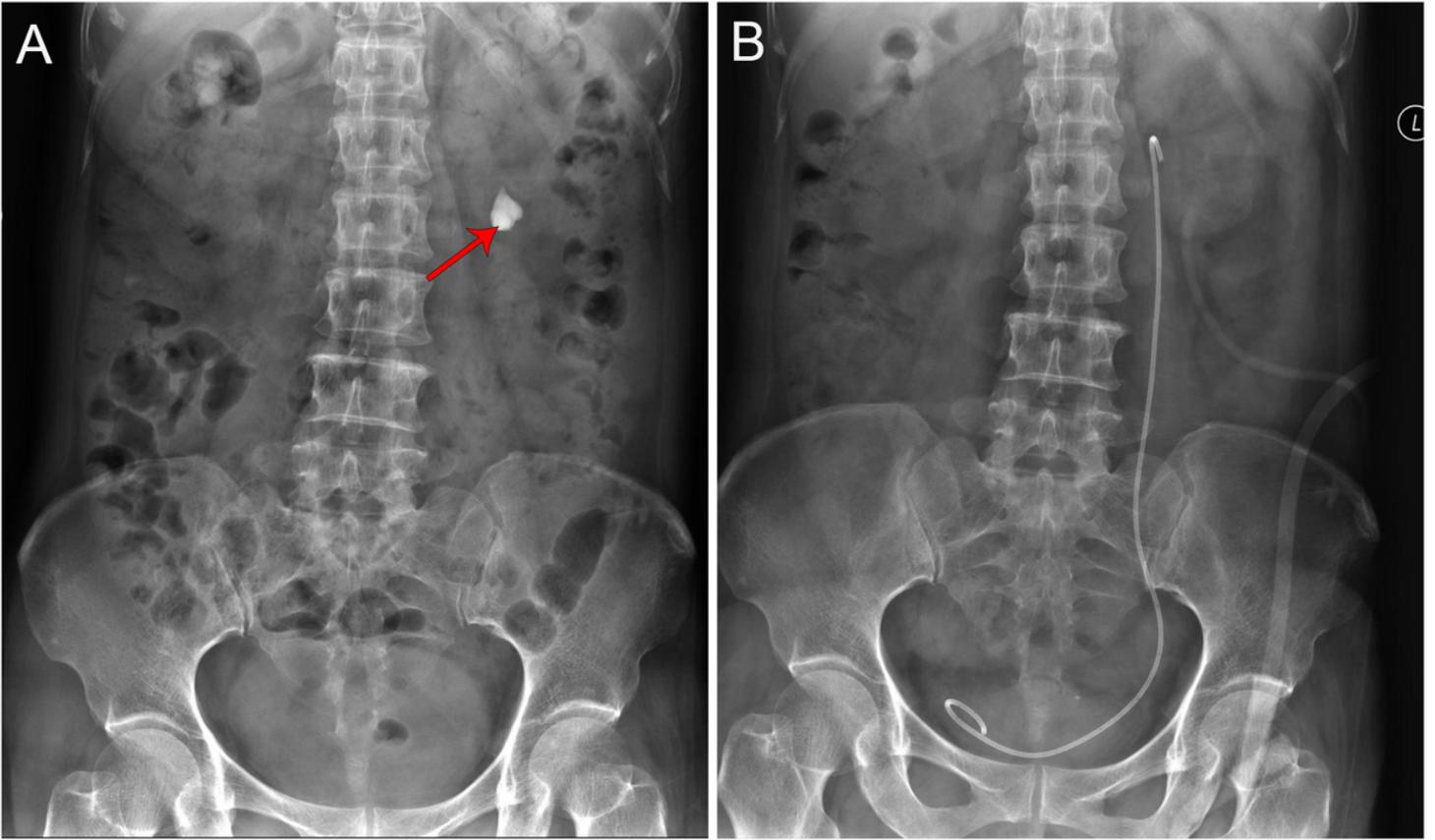
## Figure 4

(A) HE staining (100×): Bladder surface epithelial polarity was present, no significant cellular anisotropy was seen, and submucosal histiocytosis with lymphoplasmacyte-dominated inflammatory cell infiltration was seen. (B) HE staining (200×), numerous concentric circular inclusion bodies with Michaelis-Gutmann vesicles (blue arrows) were seen in histiocytes. (C) HE staining (400×), Michaelis-Gutmann vesicles (blue arrow) were magnified.



## Figure 5

**Immunohistochemistry (100×)** (A) Keratoconus protein: broad-spectrum cytokeratin was positively expressed in the overlying uroepithelium and negatively in the interstitial cells. (B) CD86: CD68 protein was weakly expressed in the overlying uroepithelium and diffusely expressed in the interstitial cells. (C) GATA3: GATA3 protein was diffusely expressed in the interstitial cells and weakly expressed in the overlying uroepithelium. (D) Ki-67: Ki-67 protein was diffusely expressed in the interstitial cells and weakly expressed in the overlying uroepithelium.



**Figure 6**

Kidney-ureter-bladder (KUB) showed (A) a stone in the left lower renal calyx (red arrow, 20 × 17 mm). (B) Renal calyx was removed after percutaneous nephrolithotomy.