

# Malakoplakia of the Kidney Extending to the Descending Colon in a Patient with Secondary Adrenal Insufficiency: A Case Report

Case  
Report

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Malakoplakia is an uncommon but distinctive type of chronic granulomatous inflammation that occurs most commonly in the genitourinary tract, especially the urinary bladder. Most patients have associated conditions characterized by some degree of immunosuppression, as seen in solid-organ transplants, autoimmune diseases requiring steroid use, chemotherapy, chronic systemic diseases, alcohol abuse and poorly controlled diabetes. We report an unusual case of the renal malakoplakia that involved the perirenal space, extending to the descending colon in a 65-year-old Korean woman with secondary adrenal insufficiency and diabetes mellitus.

**Keywords:** Malakoplakia; Adrenal Insufficiency; Diabetes Mellitus; Korea

## INTRODUCTION

Malakoplakia is a rare chronic inflammatory disease that occurs most commonly in the genitourinary tract, especially the urinary bladder. Most patients have associated conditions characterized by some degree of immunosuppression, as seen in solid-organ transplants, autoimmune diseases requiring steroid use, chemotherapy, chronic systemic diseases, alcohol abuse

and poorly controlled diabetes.<sup>1)</sup> Despite some characteristic histological features including the presence of large histiocytes with clusters of Michaelis-Gutmann (MG) bodies, malakoplakia of the kidney is difficult to diagnose because of its rarity and varying histological pictures.<sup>2)</sup> To our knowledge, there have been no case reports of malakoplakia of the kidney in a secondary adrenal insufficiency from Korea. Here, we report an unusual case of renal malakoplakia involving the perirenal space and extending to the descending colon in a 65-year-old Korean woman with secondary adrenal insufficiency and diabetes mellitus.

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## CASE REPORT

In March 2010, a 65-year-old woman was transferred from the National Police Hospital (NPH) to our facility, Shinchon Severance Hospital (Seoul, Korea) via the emergency room (ER), presenting with a decreased level of consciousness. According to her medical history, she had hypertension, diabetes mellitus for 10 years, recurrent cystitis, and degenerative arthritis. She

had been taking dexamethasone (5 mg, once a day) for the degenerative arthritis for approximately five years up to the time of admission. Three weeks before the admission, she had been hospitalized at NPH due to drowsy mentality for 3 or 4 hours. On the day of admission at NPH, she presented with a fever (38.8°C) and dyspnea. The patient was given antibiotics (ceftriaxone and azithromycin) for 14 days, on suspicion of community-acquired pneumonia. Thereafter, her presenting symptoms were improved, but she complained of consistent pain in the left lower quadrant of the abdomen. Abdomen-pelvis computed tomography (CT) scan was performed, which showed the mass-like lesion in the left renal area suspecting abscess. While being treated with ciprofloxacin, she developed a decreased level of consciousness.

Upon physical examination on the day of the admission to our hospital, her initial vital signs were as follows: blood pressure 134/71 mm Hg, pulse rate 95 beats per minute, body temperature 36.4°C, and respiration rate 18 breaths per minute. Her level of consciousness was drowsy. Her breathing sound was clear, and her heart sound was normal without any murmurs. There was no specific finding upon abdominal examination without peripheral edema. Laboratory studies had the following results (reference values): low sodium (Na) levels of 112 mmol/L (135.0–145.0), potassium (K) 3.4 mmol/L (3.5–5.5), chloride (Cl) 77.0 mmol/L (98–110), total CO<sub>2</sub> 21.0 mmol/L (24–30), low serum osmolality 240.0 mOsm (289.0–308.0), and normal urine osmolality 315.0 (50.0–1200). The thyroid function test was normal. Morning serum cortisol levels decreased to 7.1 (Table 1). Initial urinalysis results showed 3–5 white blood cells/high-power field and yeast-like organisms. In the radiological examination, there was no acute ischemic lesion in the brain magnetic resonance imaging and angiography with neck angiography (3D), and no specific finding on the chest X-ray. Sodium replacement therapy for hypotonic euvolemic hyponatremia had been started from the day of admission. At that stage, secondary adrenal insufficiency due to exogenous steroid was suspected. A low dose adrenocorticotropic hormone (1 µg cosyntropin) stimulation test was conducted to diagnose the secondary adrenal insufficiency. The stimulation test showed that there was adrenal insufficiency; basal level of cortisol 8.56 µg/dL, peak level during the hour-long test 13.94 µg/dL (Table 2). Steroid hormone (hydrocortisone sodium succinate; solucortef) was replaced.

**Table 1.** Results of laboratory analysis performed on the day of hospitalization.

	Result	Reference range
White blood cell (no./µL)	7,160.0	4,000–10,800
Neutrophil (%)	57.5	40–74
Lymphocyte (%)	25.3	19–48
Monocyte (%)	13.1	3.3–9
Eosinophil (%)	1.5	0–7
Hemoglobin (g/dL)	9.8	12.0–16.0
Hematocrit (%)	29.2	37.0–47.0
Erythrocyte sedimentation rate (mm/h)	60.0	0.0–20.0
C-reactive protein (mg/L)	48.90	0–8
D-dimer quantity (ng/mL)	503.0	0–243
Prothrombin time (s)	15.3	9.8–13.4
Prothrombin time (INR)	1.29	0.91–1.16
aPTT (s)	24.7	27.9–41.6
Glucose (mg/dL)	117.0	70–110
Hemoglobin A1c* (%)	6.5	4.0–6.0
Blood urea nitrogen (mg/dL)	2.1	5.0–25.0
Creatinine (mg/dL)	0.89	0.50–1.40
Sodium (mmol/L)	112.0	135.0–145.0
Potassium (mmol/L)	3.4	3.5–5.5
Chloride (mmol/L)	77.0	98–110
Total CO <sub>2</sub> (mmol/L)	21.0	24–30
Osmolality (mOsm)	240.0	289.0–308.0
Thyroid stimulating hormone (µIU /mL)	1.73	0.35–5.50
Free T4 (ng/dL)	1.22	0.89–1.76
T3 (ng/mL)	1.49	0.6–1.8
Cortisol* (µg/dL)	7.1	
Adrenocorticotropic hormone* (pg/mL)	16.79	
Urine osmolality (mOsm)	315.0	50.0–1,200
Urine sodium (mmol/L)	84.0	
Urine microalbumin (mg/dL)	1.95	0–3.0

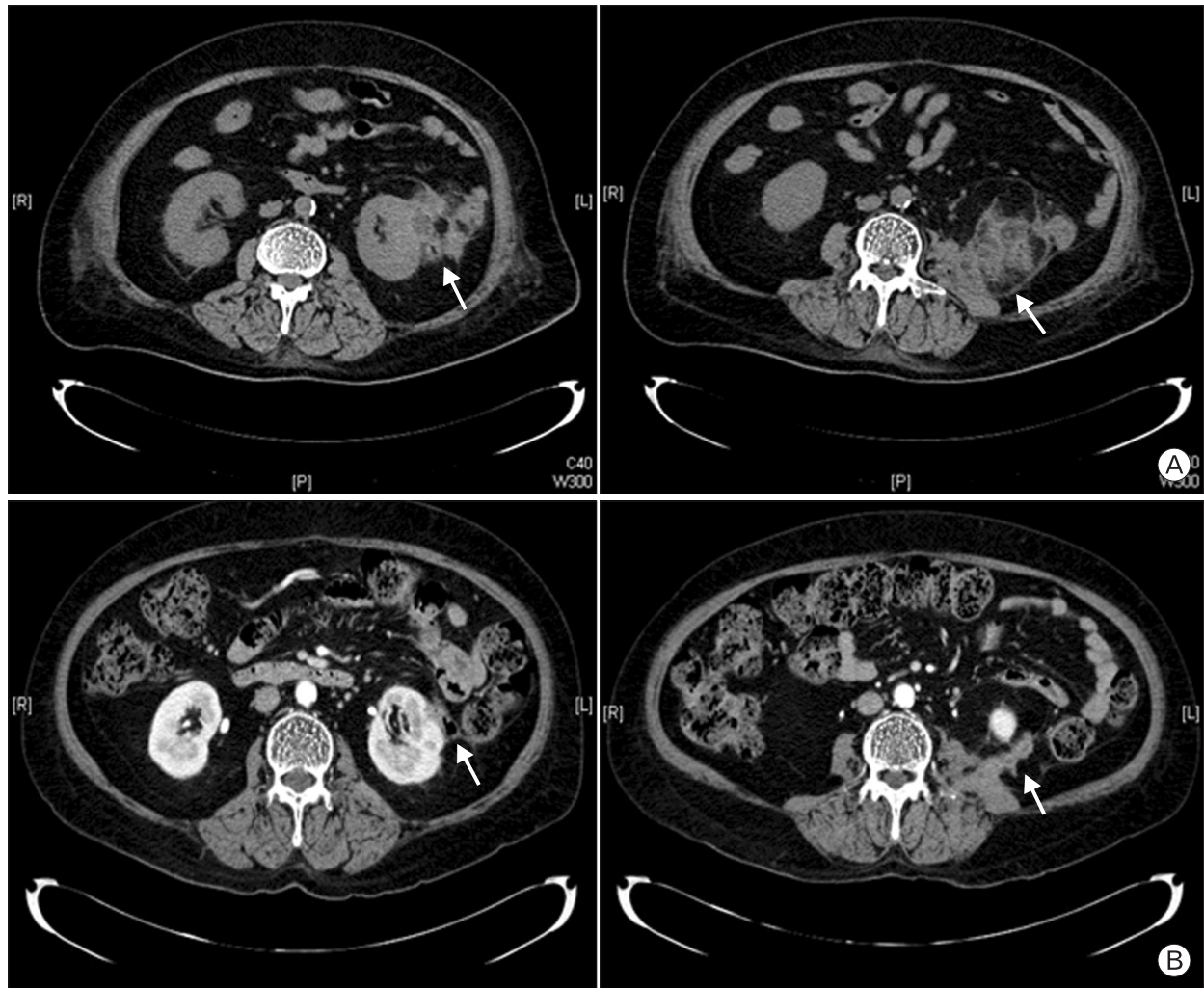
\*Test performed on the day after hospitalization.

On the third day after admission, her general condition including clear consciousness was improved, with a normal level of serum sodium (136 mmol/L), and her steroid hormone dosage had been gradually tapered down and was maintained at 7.5 mg

**Table 2.** Results of low dose adrenocorticotropic hormone stimulation Test on the third day of hospitalization.

Hormone	Level at 0 min	Level at 15 min	Level at 30 min	Level at 60 min
Cortisol* (µg/dL)	8.56	11.9	13.9	13.9

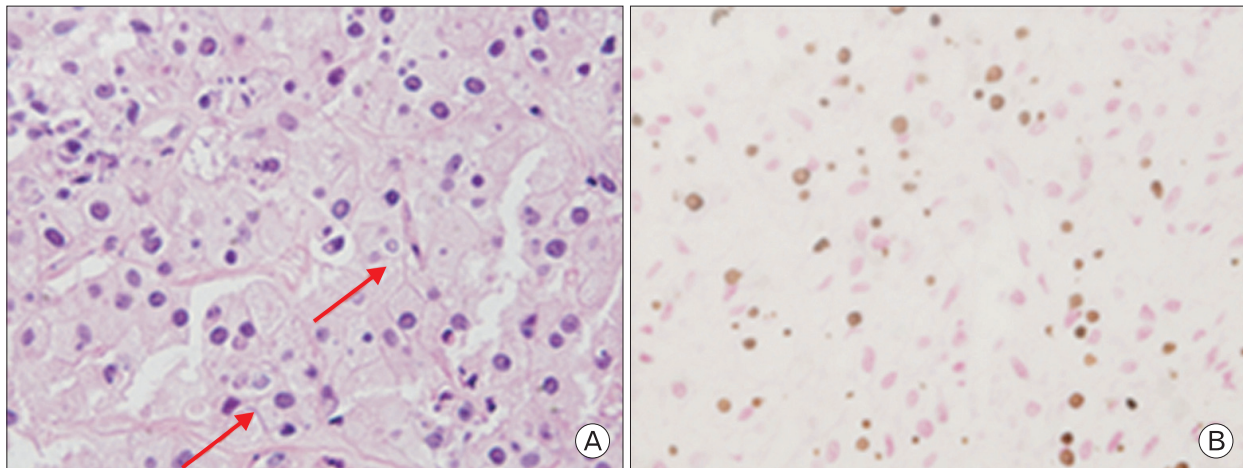
\*Reference range: 7.00–19.4 in the morning, 2.00–9.00 in the afternoon.



**Figure 1.** Abdomen-pelvic computed tomography (CT) scan. An abdomen-pelvic CT image obtained on the second day after admission (A) shows an ill-defined inflammatory lesion in the left kidney with multifocal abscess pockets in the left perirenal space, extending to the descending colon. An abdomen-pelvic CT image obtained after 4 months during readmission (B) shows the remaining ill-defined inflammatory lesion in the left kidney and descending colon involvement.

(5 mg, 2.5 mg two times a day) of prednisolone acetate. However, the patient complained of myalgia, which was accompanied with leukocytosis (white blood cell count 13,650 µg/L [neutrophil 84.9 %]). Radiological reading of the abdomen-pelvic CT conducted on the second day after admission showed that there was an ill-defined inflammatory lesion with multifocal abscess pockets in

the left perirenal space, which was suspected of actinomycosis of the descending colon, extended to the left kidney (Figure 1A). Compared to the abdomen-pelvic CT finding performed outside, the lesion seemed to have decreased slightly in size. Urinalysis was repeated and showed many white blood cells per high-power field and yeast-like organisms, which was confirmed as yeast in the



**Figure 2.** Renal biopsy (photomicrograph). (A) shows histiocytes with acellular basophilic precipitations (arrow) (H&E,  $\times 400$ ). (B) shows concentric, acellular basophilic precipitation (a.k.a Michaelis-Gutmann bodies) demonstrating calcium deposition (von Kossa stain,  $\times 400$ ).

urine culture. Considering the laboratory and radiologic findings, intravenous antibiotic treatment was started (ubacillin 1,500 mg a day) for suspected actinomycosis. No specific lesion was found at the colonoscopy performed to confirm the diagnosis of actinomycosis.

On the 12th day after admission, we conducted an ultrasonography-guided renal biopsy. The histology of the lesion showed a collection of foamy histiocytes also known as von Hansemann cells with von-kossa stain positive spheres (Michaelis-Gutmann body) (Figure 2). These findings are consistent with Malakoplakia. The patient presented dysuria and urgency, and antibiotic treatment was changed to oral ciprofloxacin (500 mg a day). On the 15th day after admission, she was discharged, as her presenting symptoms and laboratory findings were improved.

About 4 months after discharge, the patient was readmitted presenting with general weakness for one month. The findings of the abdomen-pelvic CT conducted upon readmission (Figure 1B) showed that the extent of the malakoplakia in the perirenal space had decreased since 9 week prior, as she had been taking the oral antibiotics. She has had follow-up in our outpatient clinic ever since, taking oral trimethoprim-sulfamethoxazole.

## DISCUSSION

Malakoplakia is an uncommon but distinctive type of chronic granulomatous inflammation. Upon microscopic examination,

malakoplakia is characterized by the presence of sheets of histiocytes with granular cytoplasm (von Hansemann cells) and the formation of intracellular bacterial inclusions called Michaelis-Gutmann bodies.<sup>3-7)</sup>

The pathogenesis is poorly understood, but it is thought to result from acquired bactericidal defects in macrophages occurring mostly in patients with chronic debility or immunosuppression, a kidney transplant requiring steroids, or azathioprine.<sup>8,9)</sup> These observations suggest that an altered immune response may play a role in the pathogenesis of the disease. Individuals with diabetes mellitus have a greater frequency and severity of infection. From the earliest reports on studies of adrenocortical function, there has been impressive evidence that adrenocortical hormone, and more specifically cortisol, is essential for normal immunity. Otherwise, prednisone, triamcinolone, dexamethasone and similar commercially popular steroids have the dangerous side-effect of lowering resistance to infection, which is common to all known glucocorticoids.<sup>10)</sup> According to previous studies, gram-negative bacteria, particularly *Escherichia coli*, have been isolated from involved sites of genitourinary malakoplakia in more than two-thirds of patients.<sup>11)</sup> Bacteria other than yeast were not isolated in the urine culture in the present case with cystitis because the patient was on antibiotic therapy before admission to our hospital. Although we did not carry out a detailed investigation of the patient's immunity, we believe that unilateral renal malakoplakia extending to the perirenal space and the descending colon, as observed in the present case, may result

from an interaction between various factors such as bacterial infection, impaired host immune response and diminished leukocyte function under the influence of a systemic illness such as secondary adrenal insufficiency and diabetes mellitus.

The common presenting features of malakoplakia of the kidney are high fever, loin tenderness, and a palpable mass with a history of urinary tract infection.<sup>8)</sup> Based on the reported studies, the degree of decreased kidney function varies up to acute renal failure.<sup>12,13)</sup>

Ultrasound and CT features are variable and only briefly mentioned in many reviews. Features include enlarged kidneys,<sup>14)</sup> focal hypoechoic renal masses that simulate abscesses<sup>15)</sup> and heterogeneous masses that calcify, show central areas of necrosis and are mistaken for tumors.<sup>16)</sup> The imaging appearance of malakoplakia is therefore non-specific, and malignant renal tumor is a common misdiagnosis. The final diagnosis of malakoplakia is usually attained only upon histopathologic examination of the excised specimen.

There is no established treatment for patients with malakoplakia. However, there are treatment options for malakoplakia that include antibiotics, surgical excision, or a combination of both, depending on the site and extent of involvement. Some researchers have suggested that such antibiotics as trimethoprim-sulfamethoxazole and ciprofloxacin were beneficial because of their ability to penetrate intracellularly.<sup>8,17-20)</sup> We started the treatment with ciprofloxacin. During follow-up in the outpatient clinic, we changed the antibiotic treatment to trimethoprim-sulfamethoxazole due to the patient's continued complaint of cystitis symptoms.

In conclusion, renal malakoplakia should be taken into account in the differential diagnosis of a patient who presents with urinary tract infection, fever, abdominal pain, and abscess-like lesion in ultrasonography or CT, especially if the patient concerned has diabetes mellitus and a long history of use of exogenous steroids. It is considered that family physicians' early diagnosis would enable prompt treatment and regular monitoring, leading to avoidance of long-term morbidity and mortality.

## REFERENCES

1. Hamodat M, Naghibi B, Yousef GM. Malakoplakia of the neck in a patient with cancer of the colon. *Can J Surg* 2009;52:E107-8.
2. Kobayashi A, Utsunomiya Y, Kono M, Ito Y, Yamamoto I, Osaka N, et al. Malakoplakia of the kidney. *Am J Kidney Dis* 2008;51:326-30.
3. Mannan AA, Kahvic M, Singh NG, Abu Sara Y, Bharati C. An unusual case of extensive epididymotesticular malakoplakia in a diabetic patient. *Int Urol Nephrol* 2010;42:569-73.
4. Michaelis L, Gutmann C. Uber einschlusse in blasentumoren. *Z Klin Med* 1902;47:208-15.
5. Shabtai M, Anaise D, Frei L, Waltzer WC, Frischer ZI, Jao S, et al. Malakoplakia in renal transplantation: an expression of altered tissue reactivity under immunosuppression. *Transplant Proc* 1989;21:3725-7.
6. van Crevel R, Curfs J, van der Ven AJ, Assmann K, Meis JF, van der Meer JW. Functional and morphological monocyte abnormalities in a patient with malakoplakia. *Am J Med* 1998;105:74-7.
7. Hong JJ, Liao PL, Lin JL, Hsueh S, Huang CC. Bilateral renal parenchymal malakoplakia presenting as haemolytic-uraemic syndrome. *Nephrol Dial Transplant* 1999;14:2206-9.
8. Dobyant DC, Truong LD, Eknayan G. Renal malacoplakia reappraised. *Am J Kidney Dis* 1993;22:243-52.
9. Dhabalia JV, Nelivigi GG, Jain NK, Suryavanshi M, Kakkattil S. Malakoplakia of the ureter: an unusual case. *Indian J Urol* 2008;24:261-2.
10. Jefferies WM. Cortisol and immunity. *Med Hypotheses* 1991;34:198-208.
11. Yousef GM, Naghibi B, Hamodat MM. Malakoplakia outside the urinary tract. *Arch Pathol Lab Med* 2007;131:297-300.
12. Albitar S, Genin R, Fen-Chong M, Schohn D, Riviere JP, Serveaux MO, et al. The febrile patient presenting with acute renal failure and enlarged kidneys: another mode of presentation of malakoplakia. *Nephrol Dial Transplant* 1997;12:1724-6.
13. Tam VK, Kung WH, Li R, Chan KW. Renal parenchymal malacoplakia: a rare cause of ARF with a review of recent literature. *Am J Kidney Dis* 2003;41:E13-7.

14. Mitchell MA, Markovitz DM, Killen PD, Braun DK. Bilateral renal parenchymal malacoplakia presenting as fever of unknown origin: case report and review. *Clin Infect Dis* 1994;18:704-18.
15. Lamb GH, Ayers AB. Ultrasound findings in a case of renal malacoplakia. *Br J Radiol* 1977;50:753-4.
16. Chen CS, Lai MK, Hsueh S, Hwang TL, Chuang CK. Renal malacoplakia with secondary hepato-duodenal involvement. *J Urol* 1994;151:982-5.
17. Stanton MJ, Maxted W. Malacoplakia: a study of the literature and current concepts of pathogenesis, diagnosis and treatment. *J Urol* 1981;125:139-46.
18. Mokrzycki MH, Yamase H, Kohn OF. Renal malacoplakia with papillary necrosis and renal failure. *Am J Kidney Dis* 1992;19:587-91.
19. van Furth R, van't Wout JW, Wertheimer PA, Zwartendijk J. Ciprofloxacin for treatment of malakoplakia. *Lancet* 1992;339:148-9.
20. van der Voort HJ, ten Velden JA, Wassenaar RP, Silberbusch J. Malacoplakia. Two case reports and a comparison of treatment modalities based on a literature review. *Arch Intern Med* 1996;156:577-83.