

## 신록각석에 동반된 신장 방선균증

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### Renal Actinomycosis Accompanying Staghorn Calculi

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Actinomycosis is a chronic infectious disease that is generally caused by *Actinomyces israelii*. Renal actinomycosis is a very rare disease, especially accompanying staghorn calculi formation. In this article, we present a case of renal actinomycosis with the staghorn calculi formation. A 52-year-old woman presented with a 3-month history of pain in the right upper quadrant. The abdominopelvic computed tomography scan showed staghorn calculi and severe dilatation of the pelvicalyceal system of the right kidney. A right simple nephrectomy and a partial resection of the infrahepatic inferior vena cava were performed. We anticipated that the final diagnosis would be xanthogranulomatous pyelonephritis, however histopathologic tests revealed renal actinomycosis with abscess formation and extensive inflammation, glomerulosclerosis and staghorn calculi.

**Keywords:** Actinomycosis; Kidney calculi

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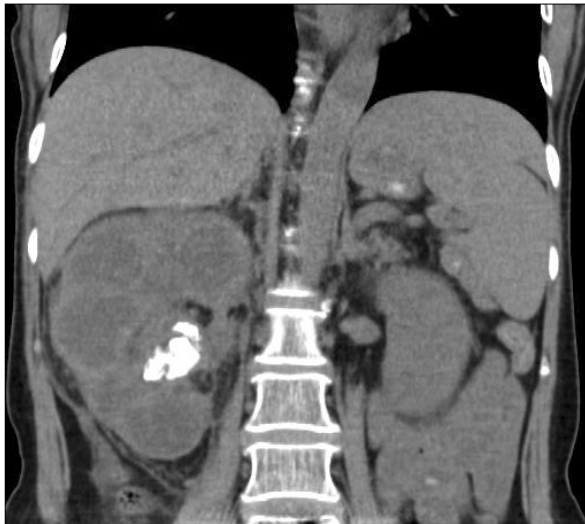
Actinomycosis is a granulomatous and suppurative infection that is localized most frequently in the cranio-cervical region.<sup>1</sup> It is a chronic infection which is very rare disease caused by *Actinomyces israelii*. Renal actinomycosis is uncommon as other urologic organ's including the urachus and the urinary bladder. It can often mimic a tumor of the urinary system. The authors report a case of renal actinomycosis accompanying staghorn calculi and a non-function kidney.

### CASE REPORT

A 52-year-old woman presented with the pain of the right

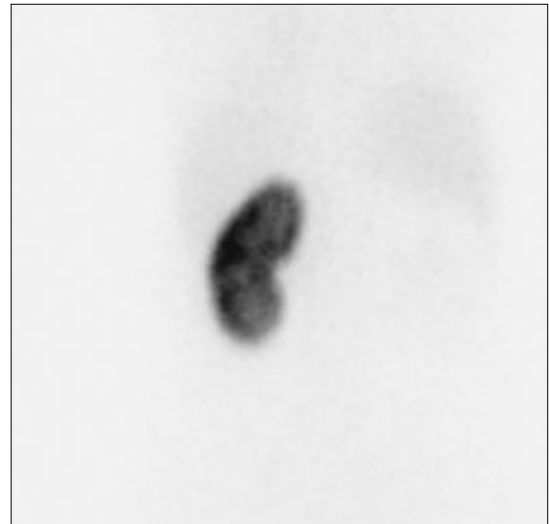
upper quadrant for 3 months. The patient did not have any familial and medical histories except 3 times-surgery histories including the appendectomy, the uterine myomectomy and the internal fixation for scoliosis. The routine urinalysis revealed 10-14 white blood cells/high power field and the blood chemistry revealed that the modification of diet in renal disease study equation estimated glomerular filtration rate is decreased as 80.4 ml/min/1.73 m<sup>2</sup>. The abdominopelvic computed tomography (CT) scan demonstrated that a 3.5×5 cm sized radiopaque lesion which showed as staghorn calculi on the pelvicalyceal system and a severe hydronephrosis were shown on the right kidney (Fig. 1). The technetium

dimercaptosuccinic acid (Tc-99m DMSA) scan revealed that the relative function of the right kidney is 2% compared with 98% of the left kidney (Fig. 2). The operator had wanted to perform laparoscopic simple nephrectomy but he could not do that because the hilum of the right kidney was severely adhered to the infrahepatic inferior vena cava (IVC), thus the surgery was converted to the open nephrectomy. A partial

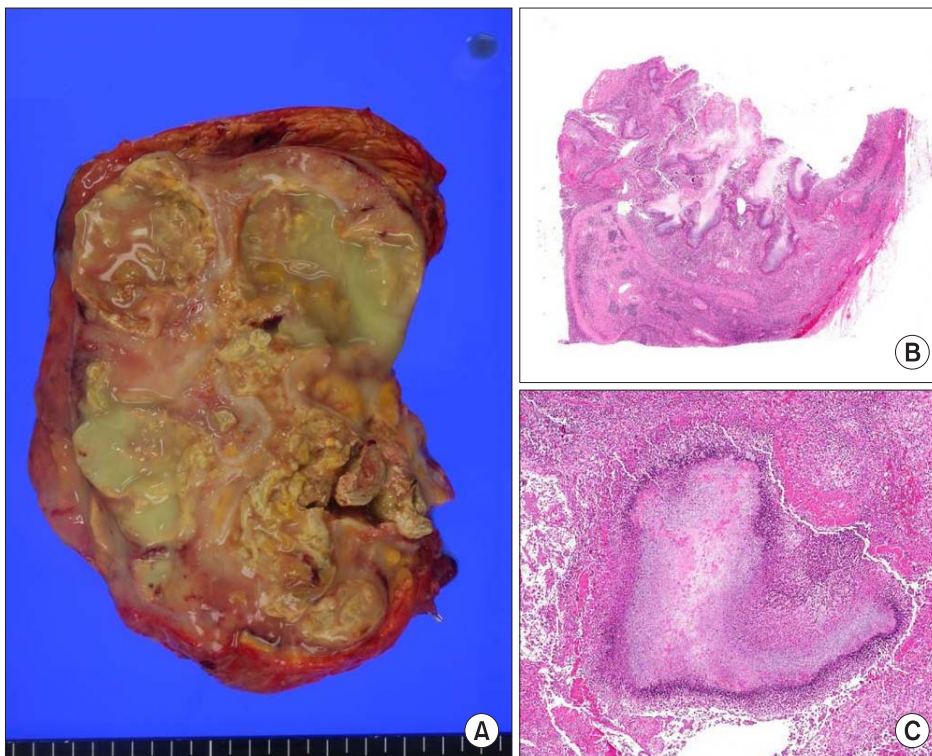


**Fig. 1.** Non-contrast enhanced computed tomography of the kidney showing hydronephrosis and radiopaque lesion on pelvocalyceal system of the right kidney.

resection of the infrahepatic IVC was performed with the right nephrectomy. The estimated blood loss was 1800 ml and operating time was 520 minutes. Histopathologic tests revealed renal actinomycosis with abscess formation and extensive inflammation, glomerulosclerosis and staghorn calculi (Fig. 3).



**Fig. 2.** The 99mTc-dimercaptosuccinic acid scan showing the invisible right kidney that the relative function is 2% compared with 98% of the left kidney.



**Fig. 3.** (A) Gross finding, (B, C) microscopic findings (H&E stain; B,  $\times 2$ ; C,  $\times 50$ ). Grossly, the kidney is enlarged, and perirenal fat tissue is fibrotic and firmly attached with renal cortical surface. (A) On section, the kidney is mainly replaced by yellowish grey or greenish necrotic and purulent tissue, forming pseudocystic changes. In area, stony hard consistency is noted and irregular fibrotic tissue is noted, peripherally. (B) Microscopically, the kidney is nearly replaced by conglomerated abscesses, associated with chronic active inflammation with fibrosis and fine calcification. Characteristic sulfur granules rimmed by neutrophils are well observed (C) and they show central degeneration.

## DISCUSSION

*Actinomyces israeli* is an anaerobic or microaerophilic, gram positive bacterium and highly susceptible to a wide spectrum of antimicrobial agents. It presents mainly in the cranio-cervical region (60-80%), thorax (10-15%), abdomen (5-20%) and exceptionally retroperitoneal organs.<sup>1</sup>

Actinomycosis often mimics a malignant mass because the radiologic diagnosis of this disease is very difficult and immunologic tests are not specific.<sup>2</sup> Magnetic resonance imaging was reported to show that mass of actinomycosis presented a relative absence of high signal intensity on T<sub>2</sub>-weighted image compared to ovarian and genitourinary malignancies.<sup>3</sup> According to Lim et al's report,<sup>4</sup> the general positron emission tomography (PET)/CT finding of actinomycosis is intense hypermetabolism as in malignancy and there is not much difference in the PET/CT findings between malignancies and actinomycosis. Thus they argued that the utilization of PET/CT to rule out malignancy did not seem to be necessary, unless the case is strongly suggestive of malignancy.

Renal actinomycosis is mostly found by symptoms of acute pyelonephritis and demonstrated a tumor like lesion on the CT scan. The correct preoperative diagnosis of renal actinomycosis is rarely made and most of diagnosis is made on specimens of the nephrectomy.<sup>5</sup> If the diagnosis is made preoperatively, it can treat high dose penicillin administered over a prolonged period (6-12 months).<sup>6</sup> Doxycycline, clindamycin, amoxicillin/clavulanate and ceftriaxone can

be used if the patient has penicillin allergy or resistance.<sup>7</sup>

In this case, we predicted that xanthogranulomatous pyelonephritis accompanying staghorn calculi were causes of symptoms, signs, laboratory findings and anatomical abnormality. Surgical debridement combined with long-term antimicrobial therapy have cured most cases of the renal actinomycosis until now, however if we can find more accurate diagnostic tools of the actinomycosis, they are more helpful for patients and surgeons.

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