

WHAT'S YOUR DIAGNOSIS?

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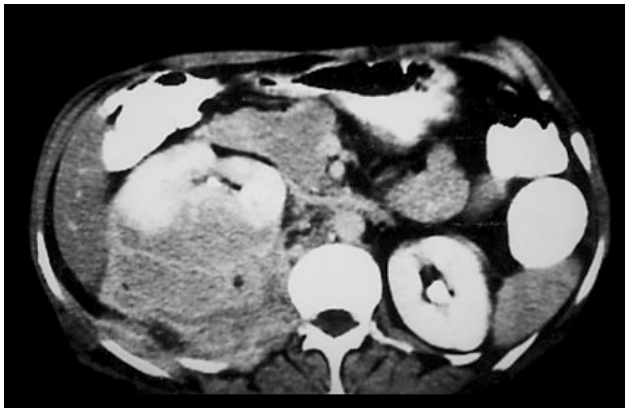


FIGURE 1. Abdominal CT scan showing a complex ill-defined mass.

History

A 40-year-old female presented with a four-month history of intermittent fever, weight loss and right loin pain. She had been under treatment at another institution, but there was no improvement in her symptoms and she was referred to our urology department for management.

The patient's clinical history was unremarkable. She had no underlying medical illness and had not undergone any surgical or urological procedure. On examination, she was pyrexial (37.5°C), and had a 15 cm mildly tender mass in the right loin. Her erythrocyte sedimentation rate (ESR) was raised at 90 mm, while her blood counts were normal. On urinalysis, she had a WBC of 6-8. Her renal parameters and liver function test were normal. Abdominal ultrasonography showed a complex ill-defined mass measuring 9.4x7.1 cm in the right perinephric space displacing the right kidney anteriorly. There was indentation of the adjacent part of the

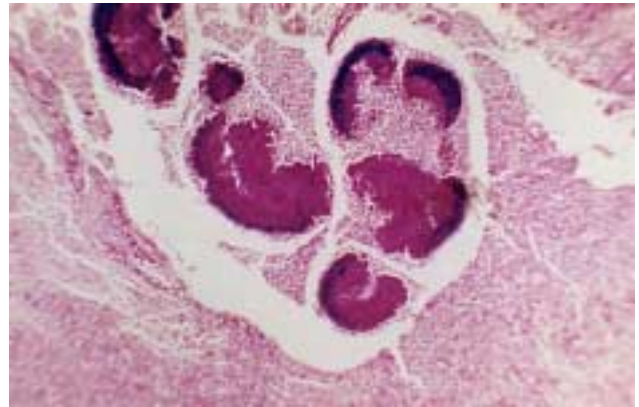


FIGURE 2. Light microscopic histological features of the excised mass.

liver. Swelling of the right rectus muscle was noted, but there was no renal vein or inferior vena cava involvement. Fine-needle aspiration (FNA) was done, which was suggestive of acute inflammatory lesion with predominantly polymorphous infiltration and scant histiocytes. CT scan (Figure 1) was carried out, which was followed by exploration of the mass. Indurated greyish mass was found mainly in the retroperitoneum, but it also involved the posterior aspect of the kidney. Excision of the mass and right nephrectomy was carried out with some difficulty. Figure 2 shows a histological examination of the mass.

1. What abnormality can be seen in Figure 1?
2. What histological features are seen in Figure 2?
3. What's your diagnosis?

ANSWER TO WHAT'S YOUR DIAGNOSIS? (PREVIOUS PAGE)

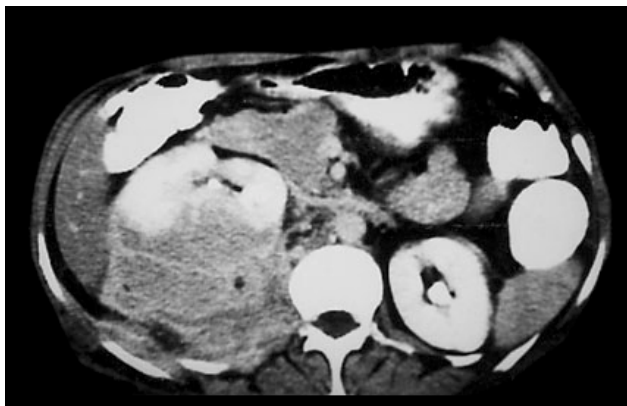


FIGURE 1. Abdominal CT scan showing heterogeneous retroperitoneal mass involving the right kidney.

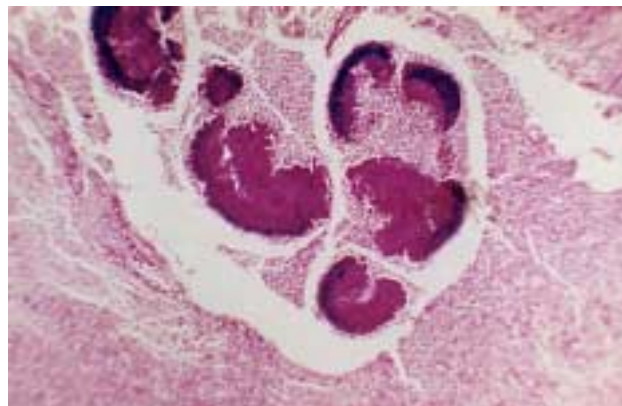


FIGURE 2. Light microscopic histological features of the excised mass showing characteristic sulphur granules surrounded by inflammatory cells.

Diagnosis: Retroperitoneal and renal actinomycosis.

Discussion: Actinomycosis is an uncommon disease. Unless specifically suspected, diagnosed, and with specific treatment started, this destructive disease may cause suppurative necrosis or granulomatous destruction of the adjacent structures.¹ The disease is caused by *Actinomyces israelii*, which exist as an anaerobic or microaerophilic, filamentous gram-positive saprophyte of the mouth and gastrointestinal tract. Since the organism cannot penetrate healthy epithelium, invasive infection is rare.^{1,2} However, when tissue is disrupted as a result of trauma, surgery or other factors, the organism can enter the tissue and remain there silently for months or even years in protected colonies known as sulphur granules. Once the bacteria are able to proliferate, they cause a subacute or chronic granulomatous inflammatory reaction that is followed by necrosis and fibrosis. Spread of infection follows connective tissue planes toward the outer skin surfaces, with invasion into adjacent tissues and eventual sinus tract formation, while frank pus is scant.¹ In rare instances, actinomycosis spreads by hematogenous or lymphatic routes.³ The site of the entry of the micro-organism usually remains obscure.^{2,4}

The most common sites of primary actinomycosis are cervicofacial, abdominal and thoracic.⁵ Genitourinary involvement is rare,^{1,6} and renal involvement (reported in around 50 cases) can be the result of hematogenous spread, direct extension from intra-abdominal process, or transdiaphragmatic extension from a thoracic focus.¹ In the present case, the right kidney was involved due to local extension from the retroperitoneum. The lesion may mimic

extension from the retroperitoneum. The lesion may mimic pyelonephritis, a renal mass or perinephric abscess.^{7,8}

In the retroperitoneum, the most common tissue reaction is the formation of a firm, fibrous avascular mass which may be mistaken for carcinoma or other type of malignancy.¹ In children, retroperitoneal actinomycosis may mimic inflammatory pseudotumor.⁹ Thus retroperitoneal actino-mycosis should be considered in the differential diagnosis of any obscure retroperitoneal mass, as it is likely to be misdiagnosed, because it may present itself within the abdomen in so many different ways and at such unlikely sites.

There is no reliable serological or skin test for the detection of actinomycosis. The diagnosis is made on the basis of the histological examination of the tissue sample when the identification of the so-called sulphur granules in the infected tissue is characteristic of actinomycosis,^{1,10} or on the result of anaerobic culture of the offending micro-organism.¹ The sulphur granules are round or lobulated white-to-yellow particles 1 to 2 mm in size, with a radiating fringe of eosinophilic projections. They are composed of a matrix of calcium phosphate and contain colonies of *Actinomyces*, cellular debris and associated organisms.¹ In the present case, histological examination of the mass showed typical sulphur granules (Figure 2) surrounded by neutrophils along with lymphocytes, plasma cells and histiocytes. Increased fibrosis was seen. In addition, a microscopic section of the involved kidney showed micro-organismal colonies dispersed in the capsule and subcapsular areas which were associated with dense fibrosis and chronic inflammatory exudate.

Treatment of actinomycosis requires: 1) use of antibiotics, and 2) the removal or debridement of infected

tissue.¹⁰ Penicillin remains to this day the drug of choice, although the dose of the drug and duration of treatment has not been standardized.¹ Review of the literature suggests that prolonged treatment of several months is essential.^{1,11} Crosse et al.³ believe that therapy should be continued for three months after all traces of infections have disappeared. In patients who are allergic to penicillin, clindamycin, erythromycin, or tetracycline can be used.^{11,12} Use of ciprofloxacin has also been suggested.¹³ Because adequate concentration of the antibiotics is not obtained within the densely scarred avascular areas where organisms flourish, surgical excision of the involved tissue is essential.³ In the present case, the patient received oral ciprofloxacin for four months after three weeks of intravenous benzylpenicillin and was doing fine at 11 months' follow-up.

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References

1. Levine LA, Doyle CJ. Retroperitoneal actinomycosis: a case report and review of the literature. *J Urol* 1988;140:367-9.
2. Dhaliwal US, Singh A, Nagpal BL. Retroperitoneal actino-mycosis. *J Indian Med Assoc* 1979;72:41-2.
3. Crosse JW, Soderdahl DW, Schamber DT. Renal actinomycosis. *Urology* 1976;7:309-11.
4. Brown JR. Human actinomycosis: a study of 181 subjects. *Hum Pathol* 1973;4:319.
5. Cope VZ. Actinomycosis. London: Oxford University Press, 1938.
6. Sheung-Fat KO, Shu-Hang NG, Tse-Yu L, Chak-Wah LO. Retroperitoneal actinomycosis with intraperitoneal spread. Stellate pattern on CT. *Clin Imaging* 1996;20:133-6.
7. Ellis LR, Kenney GM, Nellans RE. Urogenital aspects of actinomycosis. *J Urol* 1979;122:132.
8. Anhalt M, Scott R Jr. Primary unilateral actinomycosis: a case report. *J Urol* 1970;103:126.
9. Radhi J, Hadjis N, Anderson L, Burbridge B, Ali K. Retroperitoneal actinomycosis masquerading as inflammatory pseudomotor. *J Pediatr Surg* 1997;4:618-20.
10. Wise GJ. Fungal infections of the urinary tract. In: Walsh PC, Retik AB, Vaughn ED, Wein AJ, editors. *Campbell's Urology*. Philadelphia: WB Saunders Co., 1998:779-806.
11. Rashid AMH, Menai Williams R, Parry D, Malone PR. Actinomycosis associated with pilonidal sinus of the penis. *J Urol* 1992;148:172-4.
12. Patel BJ, Moskowitz H, Hashmat A. Unilateral renal actinomycosis. *Urology* 1983;11:172-4.
13. McFarlane DJ, Tucker JG, Kemp RJ. Treatment of recalcitrant actinomycosis with ciprofloxacin. *J Infect* 1993;27:177-80.