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A Case of Primary Hepatic Actinomycosis

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Actinomycosis is a chronic suppurative and granulomatous disease characterized histologically by sulfur granules with extensive necrosis,fibrosis and sinus formation.
Depending on the site of primary infection, actonomycosis is generally classified as cervicofacial,thoracic and abdominal type.
The liver is known to be the primary site of infection in 15% with abdominal actinomycosis.
The authors have experienced a case of liver abscess in a 24-year-old male. The sono-guided aspiration biopsy revealed findings of infiltration of neutrophils and characteristic sulfur granules by light microscopy.
This case was thought to represent an instance of liver actinomycosis.
Although there have been a lot of reports on actinomycosis of the liver in other countries, only 3 cases were reported in Korea.

Key Words: *liver actinomycosis,sulfur granule*

INTRODUCTION

Actinomycosis is a chronic suppurative and granulomatous disease caused by Gram-positive bacteria, *Actinomyces*, and is characterized by the sulfur granules which can be seen grossly in the lesion.

There are three distinct forms in this disease;cervicofacial,thoracic,and abdominal actinomycosis. More recently,the pelvic form is frequently classified from the abdominal actinomycosis.

Generally,the frequency of clinical diagnosis of actinomycosis is low due to its inherent low incidence and the high sensitivity of the organism to various antibiotics(David,1984).

The authors have experienced a case of liver actinomycosis which was diagnosed by sono-guided aspiration biopsy of the liver.

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CASE REPORT

An 24-year-old man was admitted because of fever,weight loss and right upper abdominal pain he had had for two months. He looked acutely ill and had lost 7 kg in weight during the two months. There was no history of abdominal surgery or trauma. Examination revealed a tall,slender man,febrile to 37.4°C with right upper quadrant tenderness. Hepatosplenomegaly was not noted.

Laboratory data was notable for a white blood cell count of 25,500 cells/mm^3 with a left shift. Hemoglobin and hematocrit were 11.3 g/dl and 35%,respectively.The serum albumin was 2.9 g/dl and the globulin 4.0 g/dl.Alkaline phosphatase was 563 KAU/l(NR 41-141). Roentgenograms of the chest and abdomen were uninformative.

Because he complained of epigastric pain,gastrofiberoscopic examination was done and the hypertrophic and erosive mucosa on the upper portion of the body was noted. The sonographic ex-

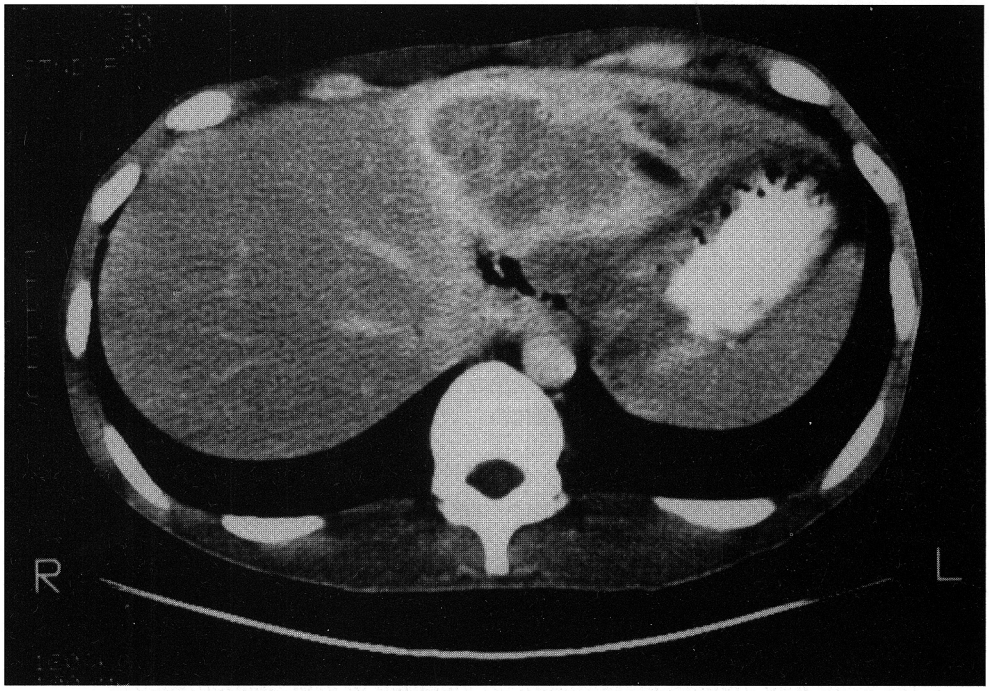

Fig. 1. The CT scan demonstrating a huge abscess with ring enhancement in the left lobe of the liver.

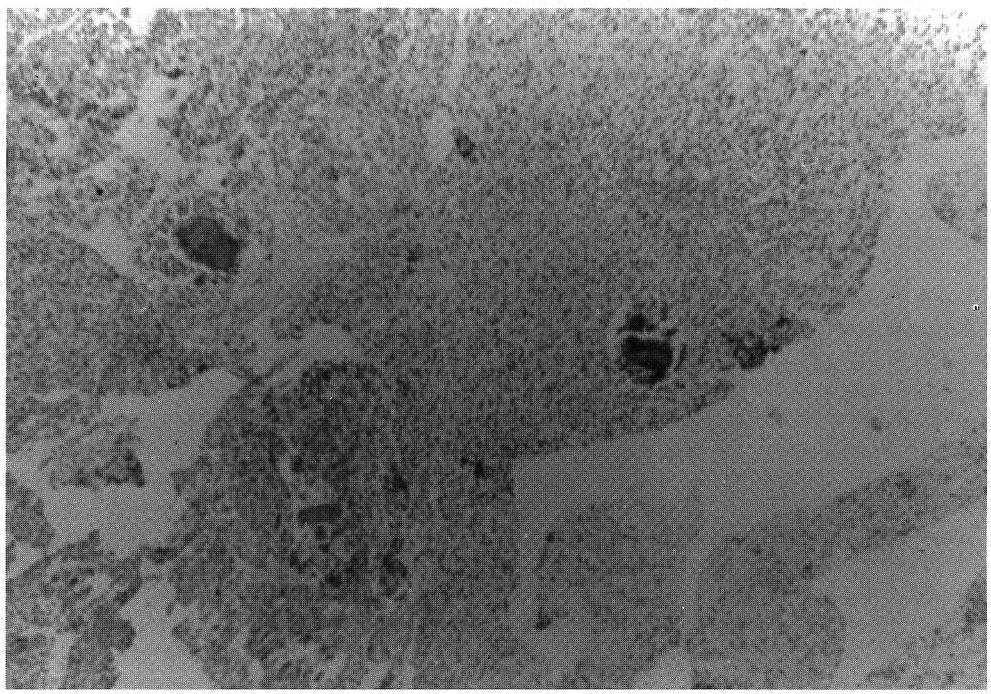

Fig. 2. Photomicrograph of aspirated liver abscess showing sulfur granules surrounded by dense polymorphonuclear infiltrates.(hematoxylin and eosin,x100).

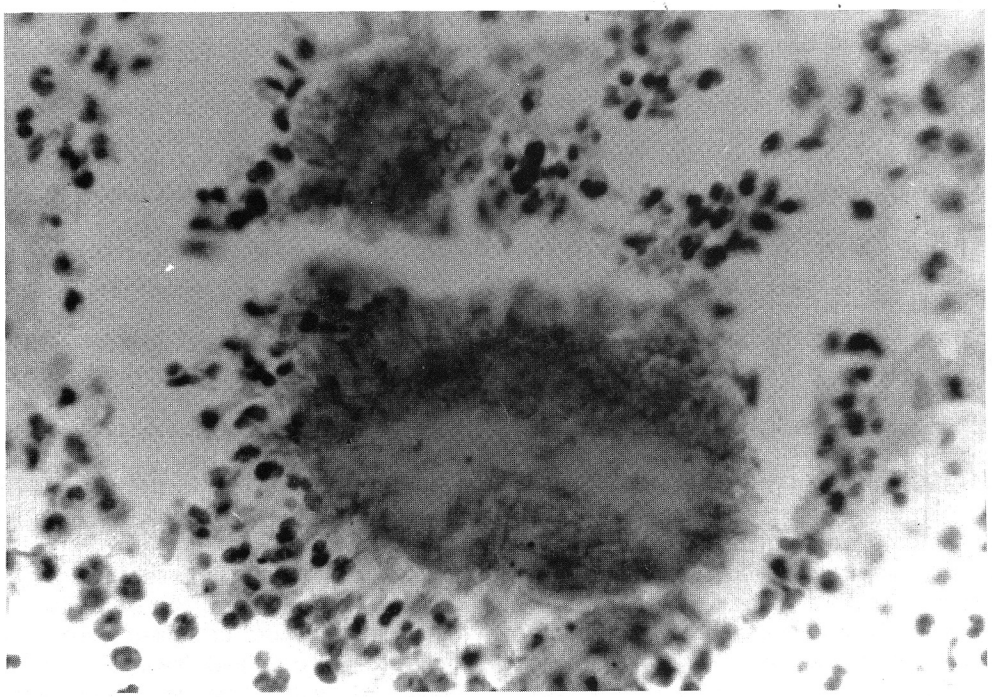

Fig. 3. High power microscopy of a sulfur granule.(hematoxylin and eosin,x400).

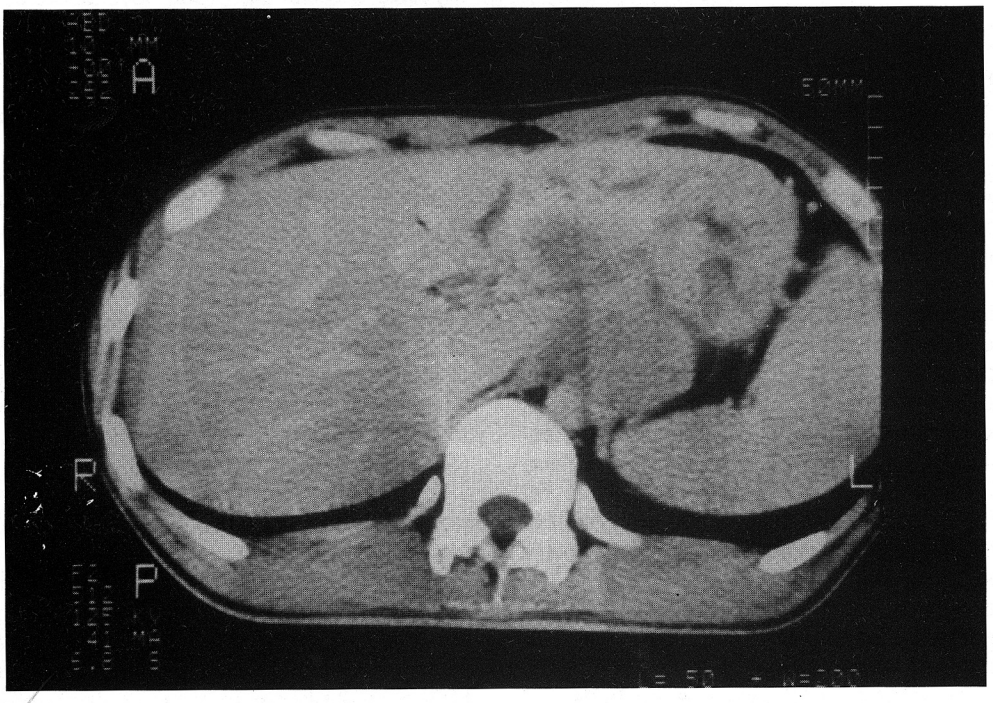

Fig. 4. The follow-up CT scan showing a much regressed abscess cavity..

amination was performed 4 days after his admission. A mass sized 7.6cm x 5.6cm x 4.4cm was found in the left lobe of the liver.The abdominal CT scan done for further evaluation showed similar findings with ring enhancement around the mass (Fig.1).

These findings were thought to represent a liver abscess and a sono-guided percutaneous liver biopsy was done. The result revealed scattered neutrophil infiltrations with sulfur granules,a finding consistent with actinomycosis(Fig. 2,3). Acid-fast staining was performed for the differential diagnosis with nocardiosis. The result was negative. The cultures prepared from biopsied tissue yielded no growth on cultures incubated aerobically and anaerobically.

He was then begun on penicillin G 18 million units a day on the twelfth hospital day. Thereafter, his temperature gradually returned to normal and the leukocyte count was decreased to about 10, 000/mm^3. His sense of well-being was also increased. The follow-up abdominal CT scan performed at 1 month later showed remarkably decreased abscess size(Fig. 4). He was discharged on oral penicillin. 6 months after symptoms onset, he is currently doing well without evidence of ongoing infection.

DISCUSSION

In 1877,Bollinger first reported the organism in yellow granules from sarcoma-like masses in the jaws of cattle.Harz,a pathologist,named the microorganisms "strahlenpilz"(ray-fungus) or actinomycosis from its microscopical appearance.

Although the name actinomyces translates literally from the Greek as "ray fungus," the etiologic agents have finally been demonstrated to be true bacteria(Wehrle,1981). The organism is Gram-positive,PAS-positive bacteria measuring about 1 μm in diameter.

The causative agent in human disease,*A israelii*, is found in normal flora of the mouth,in gastric aspirates,and in bronchial secretions(Kay,1948) and is strictly anaerobic and has never been found free in nature,probably because a temperature greater than 30°C is required for growth(Peabody and Seabury,1957).

Hepatic involvement by *Actinomyces* is known to be secondary to abdominal or thoracic infection. The organisms reach the liver either by direct extension or through the portal vein(Beradi,1979).

The liver is the primary site of infection in 15% with abdominal actinomycosis(Putnam et al.,1950).

The pathologic findings of actinomycosis are characterized by the sulfur granules,which are 1-2 mm in size,and can be seen in the pus in more than 60% of cases(Brown,1973).

The sulfur granules are actually tiny lobulated grainy microcolonies of the organism surronded by a wall of lymphocytes,plasma cells,epitheloid cells and histiocytes in abscess fashion.

The identification of organisms in pus is not easy. It has been reported that among 181 actinomycosis patients,only small numbers of organisms were detected in half,no organisms were detected in a third,and only culture could approve the organisms in the rest(Brown,1973).

In Korea, about 20 cases of abdominal actinomycosis were reported and there have been 3 cases of hepatic involvement. The primary hepatic actinomycosis was firstly reported in 1965, and that has been the only case of primary hepatic actinomycosis in Korea. But that was not official journal but a record of conference,and had preceding disease,typhoid fever. Therefore, this is thought to be the only case of primary hepatic actinomycosis without preceding diseases in Korea.

The clinical manifestations of the hepatic actinomycosis involve low-grade fever,anorexia in the early stage,acute systemic reactions,weight loss, anemia,general weakness and localized pain with the progression of the disease.If the size of abscess is large,hepatomegaly,right upper abdominal pain and palpable mass can be noted.

Actonomycosis remains a difficult disease to diagnose,since there are no pathognomonic findings.

The diagnosis is made by microscopic examination and culture.Because the microscopic findings of liver biopsy tissue are mostly those of non-specific inflammatory reactions or granulation tissues, the diagnosis is frequently delayed and occasionally an explolaparotomy is required to diagnose after several months of fever of unknown origin (Meade,1980).

Although the diagnosis of hepatic actinomycosis was known to be not easy and occasionally made by operation, a case, as in this, that presents as large liver abscess is relatively easy to diagnose.

Ultimate diagnosis is established by growth of the organism in appropriate media.However,such bacterial confirmation is accomplished in less than 50% of cases because of the overgrowth of associated bacteria,or because of lack of the proper

anaerobic media conditions, or because prior antibiotic therapy suppresses growth so that even careful culture techniques fail.

Lacking absolute bacterial identification,as in this case,a strongly presumptive diagnosis can be made based on the finding of the classical sulfur granule either grossly in lesional material or microscopically on a hematoxylin and eosin slide(Brandenburg et al.,1978;Everts,1970).

But nocardia,some staphylococcal infections (botryomycosis),coccidioido mycosis,monosporium,cephalosporium,and aspergillosis can have the same appearance(Weed and Baggenstoss, 1949;Graybill and Silverman,1969).

Myerowitz,however,has recently stated those instances to be so rare that the presence of sulfur granules virtually guarantees the diagnosis of actinomycosis(Meyerowitz,1983).

Although The mortality rate was very high before 1941(Weese and Smith,1975),the penicillins conspicuously increased the cure rate and

currently the antibiotic of choice is high-dose penicillin for several weeks until the infection is controlled.

High doses of penicillin G from 10 to 20 million units per day in divided doses intravenously for 2 to 6 weeks is the recommended therapy.Following this,oral phenoxypenicillin in a dosage of 2 to 4 grams per day a few additional weeks may suffice for most uncomplicated deep-seated infections(Lloyd and Bennett,1992).

Other antibiotics shown to have activity against actinomyces are tetracycline,doxycycline,clindamycin,erythromycin,cephalothin,and chloramphenicol(Berardi,1979). Following these recommendations for antibiotic therapy has resulted in a cure rate of greater than 95%(Weese and Smith,1975).

If the infection responds poorly with penicillin, the following situations should be considered: in adequate dose or duration of penicillin,presence of antibiotic-resistant organism,undrained abscess and hidden malignancy or tuberculosis.

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