Liver Abscess with Actinomycosis in a Child Presenting as a Subcutaneous Mass

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A 9-year-old boy suffered for several days from a painful mass on the right side of his back. Abdominal ultrasound showed a hypoechoic mass in segment 6 of the liver. Computed tomography revealed a 4 × 7 cm, poorly defined ruptured hepatic tumor. Laboratory findings revealed leukocytosis in the absence of a left shift and mild anemia. During the laparotomy, a liver abscess with surrounding fibrosis was found. The pathological report showed that the liver abscess was caused by actinomycosis. The boy recovered without complications and was discharged on the 9th postoperative day. He received oral antibiotics for 3 months after the operation. A liver abscess with actinomycosis is rare, especially in children. To our knowledge this is the first report on this disease in the form of a subcutaneous mass. We report this case and review the literature.

Key words: liver abscess, actinomycosis, subcutaneous mass

Actinomycosis is rare and usually caused by Actinomyces israelii, a gram-negative anaerobic filamentous bacterium. Actinomyces israelii is a normal flora of the oropharynx, gastrointestinal tract, and female genital tract. Although most manifestations occur in the cervicofacial area, it is occasionally found in the abdomen.²,³ Typically, abdominal actinomycosis occurs after trauma, perforation of the gut, or an operation of the gastrointestinal tract.³ The lesion most commonly involves the ileocecal region, followed by the colon, stomach, and liver.⁴

The case of hepatic actinomycosis we discuss here is unique because it was manifested as a subcutaneous mass that was continuous with the liver abscess in a boy.

Case Report

A 9-year-old boy experiencing pain for several days was brought to hospital with a mass on the right side of his back. His past history was normal with the exception of having undergone an appendectomy 9 months earlier. No fever or previous trauma was noted. Physical examination revealed a non-movable and non-erythematous 4 × 2 cm tender mass on the right lower back (Fig 1). An ultrasound showed a 4.8 × 2.1 cm hypoechoic mass located in segment 6 of the liver (Fig 2). After admission, abdominal computed tomography depicted a 4 × 7 cm, poorly defined ruptured hepatic tumor in the posterior segment of the right hepatic lobe (Fig 3). This tumor extended toward the inner aspect of the ribs and formed a protruding mass. Laboratory analysis revealed the following data: white cell count 16300/µL (neutrophils, 65.6%; lymphocytes, 22.2%; eosinophils, 2%; monocytes, 9.1%), hemoglobin 10.5 g/dL and platelets 854 ×10³ /µL. A laparotomy was performed because the radiologist suspected that the tumor had ruptured. During surgery, a liver abscess with surrounding fibrosis was found in segment 6 and protruded toward the inner aspect of the thoracic cavity.

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Frozen section revealed an abscess and cytology revealed no malignant cells. The patient had drainage of the liver abscess and liver biopsy. Although the boy’s previous appendicitis had grown Escherichia coli and Peptostreptococcus micros, mass grew only Escherichia coli this time. Pathological investigation revealed actinomycosis in the liver abscess (Fig 4). The boy was treated with intravenous amoxicillin and clavulante potassium post-operatively. He recovered without complications and was discharged on the 9th day following the operation. He received an oral form of amoxicillin and clavulante potassium for 3 months after the operation. The mass on his back was still present 3 months after the operation despite its smaller size.

**Discussion**

Actinomycosis in the liver is rare. In humans actinomycosis predominantly affects males in their forties and fifties, accounting for 5% of all actinomycosis and 15% of all abdominal actinomycosis cases. Although hepatic actinomycosis is usually secondary to abdominal or thoracic infections, primary hepatic actinomycosis has been reported. Hepatic development can occur via the portal vein, the hepatic artery, the duodenobiliary reflux, or due to direct extension from an adjacent lesion.

Although abscesses are usually confined to the liver, they may occasionally extend to adjacent tissues when normal anatomical barriers are disrupted. Production of proteolytic enzymes by the actinomyces might lead to direct extension through the liver capsule.

Onset of actinomycosis is usually subacute and the main symptoms are fever, abdominal pain, and weight
loss. The most common clinical findings include hepatomegaly and abdominal tenderness. Our patient was afebrile but had a subcutaneous tender mass. This study is the first, with the exception of one case of cutaneous fistula, to report a subcutaneous mass as a major initial symptom. Although the mechanism is unknown, cutaneous actinomycosis is often the result of contiguous dissemination of underlying foci.

Laboratory tests reveal non-specific findings, including leukocytosis in 75% of cases and elevated alkaline phosphatase in 30% of cases. Ultrasound, CT scan, and MRI have shown single or multiple abscesses or a mass, but these radiological findings are non-specific for hepatic actinomycosis, and differential diagnosis from liver pseudotumor or primary hepatic malignancies is practically impossible. In this case, hepatic tumor with rupture was suspected by the radiologist and we decided to perform surgical intervention. The diagnosis was most often confirmed by microscopic examination of surgical samples, typically using sulfur granules or actinomyceses in anaerobic cultures of percutaneously aspirated or surgically acquired material.

Therapy includes percutaneous drainage, hepatic resection, or a prolonged course of antibiotics. However, recurrence years after regression of the primary abscess implies that antibiotic treatment alone might be insufficient in some patients. Standard therapy for actinomycosis requires large doses of penicillin but the duration is debatable. An initial parenteral therapy is recommended for 2-6 weeks followed by oral therapy for an additional 3 to 12 months.

### Conclusions

Hepatic actinomycosis should be considered in differential diagnosis of any liver abscesses. In addition to fever, abdominal pain or weight loss, a subcutaneous mass might be another symptom of hepatic actinomycosis, especially when the mass is very painful and is located on the chest wall outside the liver.

### References

一個以皮下腫塊來表現的小兒放射菌肝膿瘍：病例報告

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一個9歲男孩因右上腹疼痛的腫塊而來求治。超音波發現在肝臟有一個腫塊，而電腦斷層則發現此腫塊大小為4×7公分，且疑似肝臟腫瘤。實驗室檢查大致正常。手術中發現為肝臟膿瘍，且病理報告顯示為放射菌感染。病患術後恢復情況良好，並接受三個月的口服抗生素治療。放射菌感染所導致的肝膿瘍是相當少見的疾病，而以皮下腫塊來表現則更屬罕見。我們報告這一個病例並回顧相關的文獻。