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Case report

Acute appendicitis in a child with nonspecific signs and symptoms and nondiagnostic sonography: Necessity of computed tomography ☆,☆☆

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ABSTRACT

Acute appendicitis is a common acute abdomen in children, especially in children over 5 years old. Although the incidence rate is lower than that of adults, the disease is more serious than adults. The rate of complication of peritonitis and perforation of appendix is even high. Generally, abdominal pain is still the main symptom of acute appendicitis in children, but children cannot express it, parents and doctors are easy to neglect. Ultrasound is the most commonly used imaging examination in the diagnosis of acute appendicitis in children. High fever can appear earlier, up to 39°C, at the same time can have mental atrophy, chills, convulsions and toxic shock. However, when the clinical symptoms of patients are not typical, and no obvious abnormality is found by ultrasound, it is easy to cause misdiagnosis to clinicians. Here we report a case of 9-years-old Chinese female with intermittent abdominal pain and vomiting. Initially she was diagnosed with acute gastroenteritis and was treated with antibiotics. However, there was nothing found by ultrasound, and her abdominal pain symptoms still did not relieve. Finally, abdominal CT examination confirmed acute appendicitis after 48 hours. The lesson is that ultrasound scanning should not be limited to the right lower abdomen, due to the great variation of appendix position in children with appendicitis. In addition, if there is no abnormality found by ultrasound and the infection index is increased, we suggest that abdominal CT should be examined immediately.

Introduction

Acute appendicitis is a common surgical emergency in children, accounting for 1%-8% of all abdominal pain cases [1]. Due to the atypical clinical manifestations and poor communication ability of children, it is difficult to diagnose acute appendicitis. At present, the clinical diagnosis is mainly based on the results of medical history, physical examination, laboratory examination and imaging examination.

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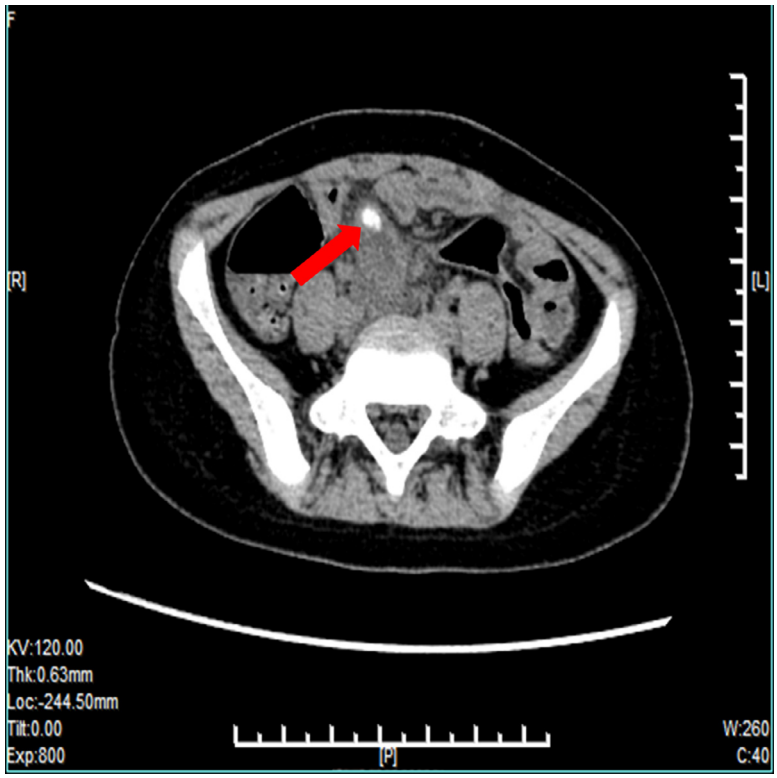

Fig. 1 – CT showed enlarged appendix, thickened wall, appendiceal fecalith and cavity effusion.

Case presentation

A 9-years-old Chinese female with no significant past medical or surgical history presented with a 2-day history of intermittent abdominal pain and vomiting. The vomit was gastric content, non-bilious and without diarrhea. The immunization was carried out according to the community program, and there was no omission.

On initial physical examination in the emergency department, there was tenderness around the navel without rebound pain and abdominal muscular tension. She had no fever, and the heart rate, respiratory rate, and blood pressure were normal. Laboratory testing revealed a C-reactive protein level of 10•38 mg per liter (normal value, <5•0), and a white-cell count of 20600 per mm^3 with 89•84% neutrophils. No abnormality was found in abdominal ultrasonography except for swollen lymph nodes. She was treated with intravenous antibiotics.

The patient came back to the emergency department next day because of non-significant pain relief. She underwent ultrasonic examination again, and the results were the same as before. The patient was admitted to the hospital and developed abdominal distension, muscle guarding, compulsive crouched position, and hypothermia. Because of indiscernible etiology, a computed tomography (CT) was performed immediately, which revealed enlarged appendix, appendiceal fecalith (Fig. 1) and ruptured appendix with exudation of the periappendiceal fat (Fig. 2). The patient was arranged for consultation and performed an emergent laparoscopic surgery, which revealed gangrene and perforation of the appendix. The postoperative diagnosis was acute suppurative appendicitis. The patient recovered and discharged within 8 days and was well at 3 months' follow-up.

Acute appendicitis in children lacks specific symptoms. Abdominal distension and compulsive position are significant signs. In children with acute abdomen, CT should be performed if the initial physical examination and abdominal ultrasound do not make a clear diagnosis.

Discussion

Older children (over 6 years) can better communicate and describe the symptoms of acute appendicitis, and the early diagnosis of acute appendicitis becomes relatively easy [2]. However, a clinical study showed that about 15% of children have visited the emergency department twice or more before they can be diagnosed [3]. A study of 102 children explored the risk factors for appendiceal perforation and found that the duration of pain and the presence of appendiceal stones were the most important factors [4].

Ultrasound is a common imaging evaluation method in the diagnosis of acute appendicitis. The guideline suggests that children with atypical clinical feature and atypical ultrasonic signs should be observed through systematic physical examination and repeated imaging examination, which may significantly reduce the CT examination rate of children [5].

However, ultrasound diagnoses failed in this patient. We analyzed the possible reason is that the mesentery of ap-

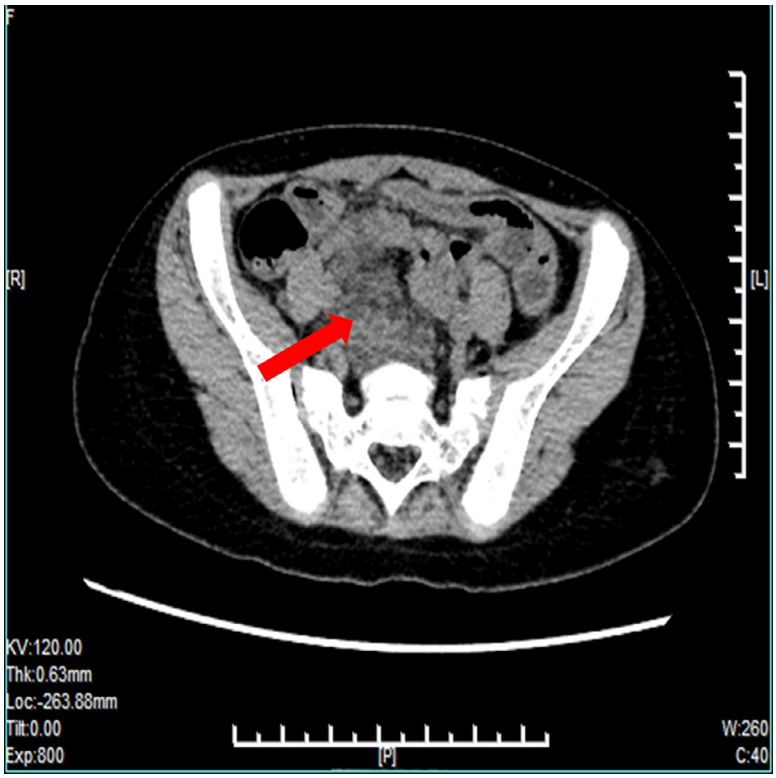

Fig. 2 – A ruptured appendix with exudate mass flowed into the abdominal cavity, and the surrounding tissue structure was clear.

pendix in children is longer than that in adults. When inflammation occurs, the position of appendix may vary greatly due to the traction of Omentum. Therefore, if the ultrasound scan is only limited to the right lower abdomen (McBurney point), there may be misdiagnosis. It is very important that ultrasound diagnosis of acute appendicitis in children depends on experienced ultrasound doctors. However, for some developing countries and hospitals with poor medical resources, this may not be available. Therefore, on this condition, CT examination is necessary.

In view of its radiation hazard, CT examination in children is limited. According to our clinical experience, for children with negative initial ultrasound and persistent abdominal pain, CT examination should be carried out immediately and repeated ultrasonography does not help to confirm the diagnosis.

Authors' contributions

Tieshan Liu collected the clinical data and wrote the paper. Lina Wang wrote the patient's consent for publication.

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