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Nonoperative treatment of acute appendicitis in children

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Abstract

Background/Purpose: Appendicitis is considered by many surgeons to be a surgical emergency for which necessary to avoid perforation of the appendix. Although it has also been treated nonoperatively using antibiotic therapy, experience in such treatment in children with acute appendicitis (AA) is extremely limited. In addition, previous studies on nonoperative treatment (NT) showed it to be a cause of morbidity and mortality. The authors hold that not all appendicitis cases respond to NT because only some of the cases recover. In the present study, 16 of 95 cases with AA were selected for NT according to physical and ultrasound examinations. The clinical and ultrasonographic findings of the cases are presented.

Methods: The medical records of all children with appendicitis treated between August 2003 and March 2006 were retrospectively reviewed . Patients who had history of abdominal pain for less than 24 hours with localized abdominal tenderness and hemodynamic stability underwent NT. Children were treated with parenteral antibiotics (ampicillin with sulbactam, 100 mg · kg^{-1} · 24 h^{-1}, divided into 3 doses daily, and ornidasole, 20 mg · kg^{-1} · 24 h^{-1}, divided intro 2 doses daily), intravenous fluid, and nothing by mouth for at least 48 hours.

Results: A total of 136 patients with appendicitis were treated. Of the cases, 95 (70%) were AA, and 41 (30%) had perforated appendicitis. Sixteen (16.8%) cases of AA were selected for NT (12 boys and 4 girls; age range, 5-13 years; mean age, 9 years). The mean anteroposterior diameter of the appendix at the presentation was 7.11 ± 1.01 mm (range, 6-9.5 mm). Ultrasound examination was repeated after 48 hours of treatment. The mean diameter of the appendix was 4.64 ± 0.82 mm (range, 3.6-6.8 mm). The difference was statistically significant ($t = 9.63$, $P < .0001$). Nonoperative treatment was successful in 15 (93.7%) of the 16 patients.

Conclusion: Hyperplasia of the appendiceal lymphoid follicle frequently causes luminal obstruction. Antibiotic therapy probably causes regression of lymphoid hyperplasia because of suppression of bacterial infection and prevents ischemia and bacterial invasion in the early stage of appendicitis. We found that some of the patients who had a history of abdominal pain for less than 24 hours with localized abdominal tenderness and hemodynamic stability could be treated nonoperatively.

Acute appendicitis (AA) is the most common surgical emergency in children [1]. It results from luminal obstruction with fecaliths, hyperplasia of the appendiceal lymphoid follicle, carcinoid tumors, and foreign bodies. Hyperplasia of the appendiceal lymphoid follicle frequently causes

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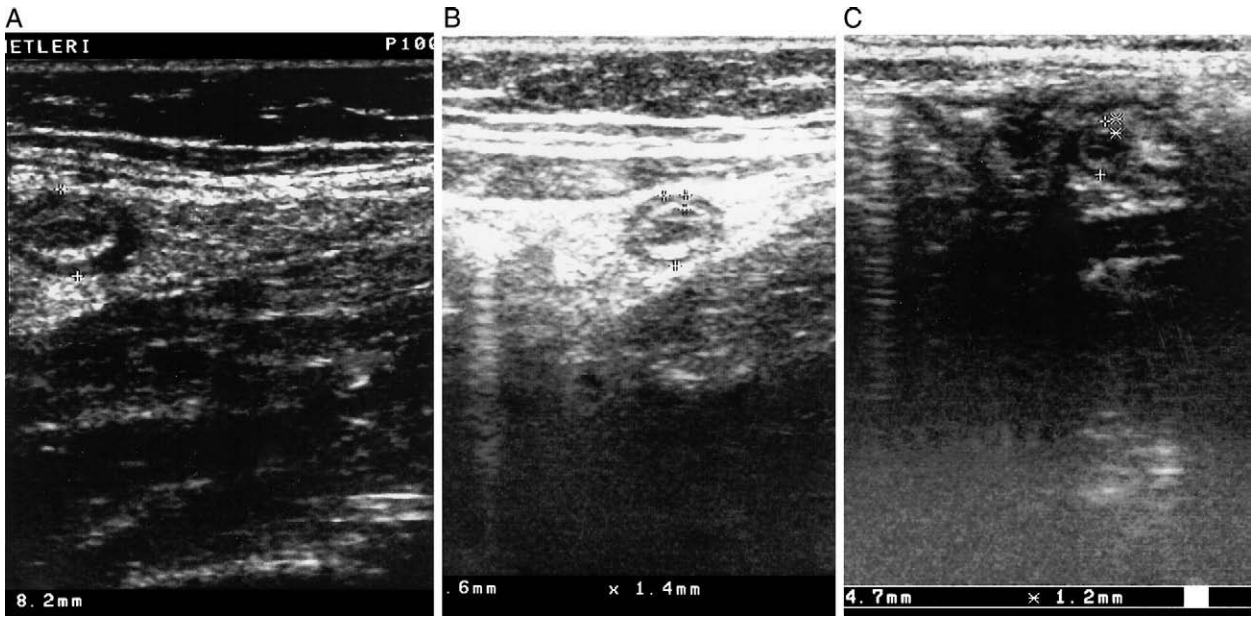

Fig. 1 Ultrasound images, which show transverse diameters of the appendix before (A) and after (B, C) treatment.

luminal obstruction. Obstruction of the lumen is followed by distension and vascular changes. When the mucosal barrier is broken, bacteria invade the muscular wall and, finally, perforation develops [2-6]. Appendicitis is therefore considered to be a surgical emergency. However, it has been also treated nonoperatively with antibiotic therapy [5,7-12]. In most cases, antibiotics are used in the early stage of appendicitis, in an effort to cause regression of lymphoid hyperplasia caused by bacterial infection and ultimately to prevent ischemia and bacterial invasion.

The experience with nonoperative treatment (NT) of AA in children is extremely limited. Nonoperative treatment was observed to cause morbidity and mortality in previous studies [8,10-12]. We believe that not all appendicitis cases respond to NT and that only some of these cases are able to recover. In this study, 16 cases with AA were selected of a

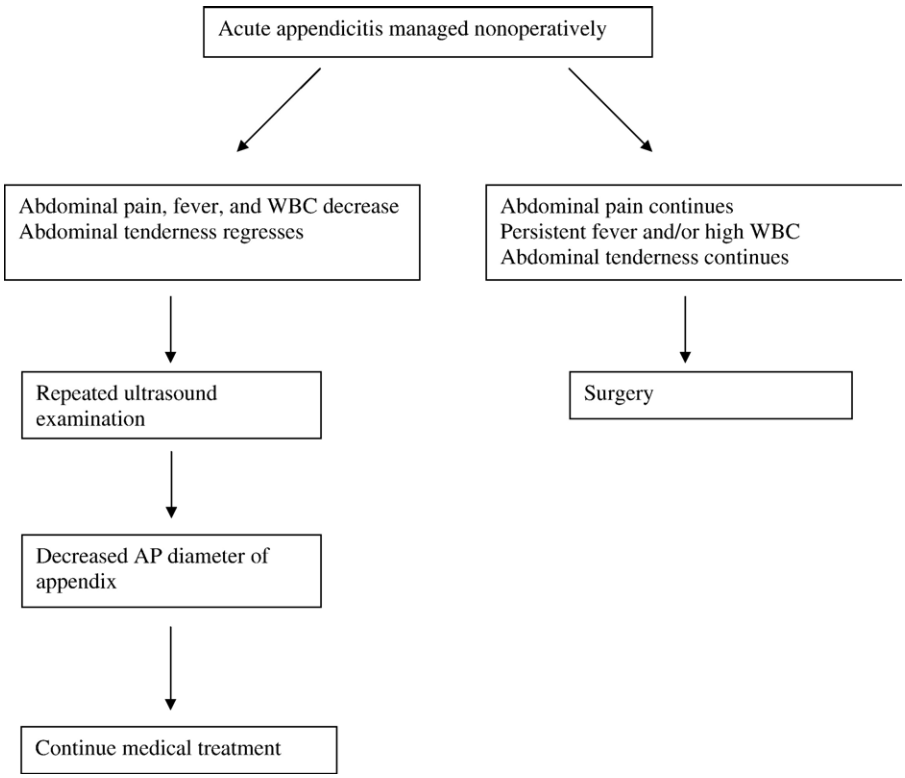

Fig. 2 Algorithm for NT of AA.