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Acute appendicitis complicated by necrotizing fasciitis in a teenager

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ABSTRACT

Necrotizing fasciitis is a rare complication of appendicitis in children and is associated with significant morbidity and mortality. We present the case of a 16-year-old male who presented with perforated appendicitis and subsequently developed necrotizing fasciitis of the abdominal wall and perineum. His seven-week hospital course was notable for 16 trips to the operating room, which culminated in staged, complex abdominal wall repair. Ultimately he was discharged home in good condition. The case is remarkable for the extent of soft tissue damage and complexity of repair precipitated by an uncommon complication of a common pediatric disease.

1. Introduction

Appendicitis is a common cause of an acute abdomen in children [1]. Delay in treatment increases the likelihood of complications [2]. Necrotizing fasciitis is an uncommon complication of appendicitis, particularly in children, but is associated with significant morbidity and mortality [3]. We present the case of a 16-year-old male who presented with perforated appendicitis, underwent laparoscopic appendectomy, and developed necrotizing fasciitis. The case illustrates the need for timely diagnosis and aggressive surgical management of necrotizing fasciitis, as well as the need for vigilance in working-up even the most routine of pediatric diseases.

2. Case report

A 16 year-old, previously healthy male presented to a community hospital with abdominal pain, scrotal swelling, and signs of dehydration and sepsis. The abdominal pain had been present for three days but the patient had delayed seeking medical care because he attributed the pain to withdrawal from synthetic ("spice") marijuana. He also reported having been struck in the groin during wrestling practice six days prior to presentation. Testicular ultrasound demonstrated a large hydrocele and what appeared to be a bowel-containing right inguinal hernia. Computed tomography (CT) showed evidence of inflammation in the right lower quadrant and extraluminal air extending into the right scrotum (Fig. 1). The differential diagnosis at this time included perforated appendicitis and traumatic perforation of herniated bowel. Fluid resuscitation and empiric antimicrobial therapy with piperacillin-tazobactam were initiated.

The patient was transferred to a regional hospital where he was taken to the operating room (OR) for diagnostic laparoscopy, which revealed perforated appendicitis and diffuse peritonitis with no evidence of inguinal hernia. Laparoscopic appendectomy with abdominal washout was performed. The scrotum was aspirated percutaneously due to concern for local extension of the infection, but no purulent material was aspirated and no further intervention was performed. The patient's condition initially improved, but he exhibited persistent tachycardia and developed erythema and bullous changes of the right scrotum and inguinal region, for which clindamycin was added to his antibiotic regimen. Multiple sets of blood cultures drawn at this time grew no organisms. He was taken back to the OR on postoperative day five, at which time he was found to have necrotizing fasciitis of the perineum and right groin. Local debridement was performed and a negative-pressure wound vacuum applied. Postoperatively, he remained intubated and required ionotropic support. Gram stain of scrotal and abdominal fluid demonstrated gram negative rods and gram positive cocci. Cultures eventually grew *Escherichia coli* with intermediate resistance to piperacillin-tazobactam, as well as *Bacteroides fragilis* and *Streptococcus constellatus*. Meropenem and vancomycin were initiated, and piperacillin-tazobactam was discontinued.

Two days later he remained in critical condition and was transferred to a quaternary care pediatric hospital. His APACHE IV score at the time of transfer was 70, with a corresponding mortality risk of 37.3% [4]. He was taken to the OR for debridement of the scrotum, abdominal wall,

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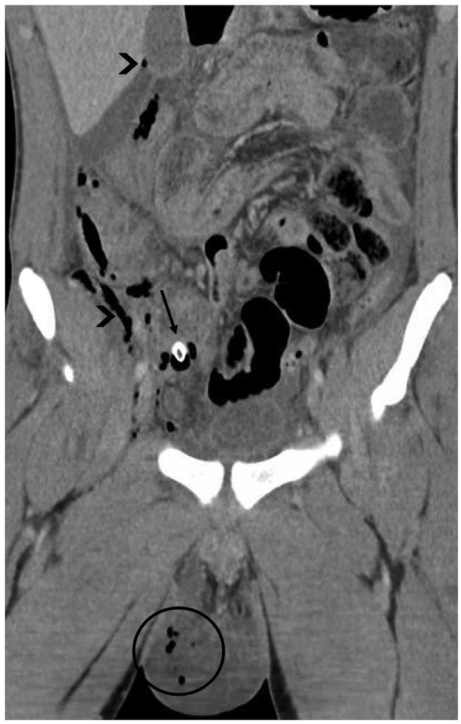

Fig. 1. CT at time of initial presentation. Coronal view demonstrating 1) appendicolith (arrow), 2) extraluminal air in the peritoneum and retroperitoneum (arrowheads), and 3) pneumoscrotum (circle).

perineum, right lateral chest wall and flank (Fig. 2). Over the course of the next three weeks he was taken to the OR an additional ten times for wound debridement, negative pressure dressing application, and

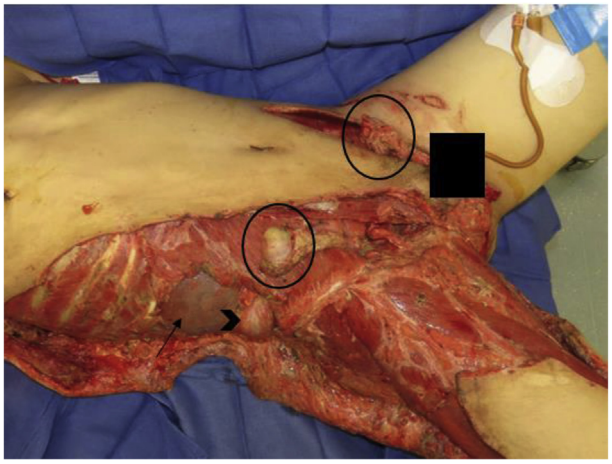

Fig. 3. Appearance of wound on hospital day seven following initial four debridements. Surgical concerns at this time included: 1) full thickness abdominal all defect with exposed liver (arrow) and colon (arrowhead) 2) exposed bilateral testicles (circles) and 3) massive skin defect.

complex abdominal wall reconstruction. Control of the infection ultimately required removal of the external oblique, serratus, and inferior latissimus dorsi muscles on the right side, resulting in a right flank wound measuring 68 × 15 cm, right leg wound measuring 30 × 8 cm, and a left flank and perineum wound measuring 30 × 8 cm. The full thickness defect resulted in exposure of the liver, colon, and bilateral testicles (Fig. 3). Reconstruction of the right abdominal wall was achieved in a staged fashion by means of an acellular dermal matrix (Fig. 4), gracilis flap, and vastus lateralis flap (Fig. 5). Repair on the left side was accomplished with primary closure over a drain (Fig. 6).

The patient's course was complicated early on by pneumonia, which

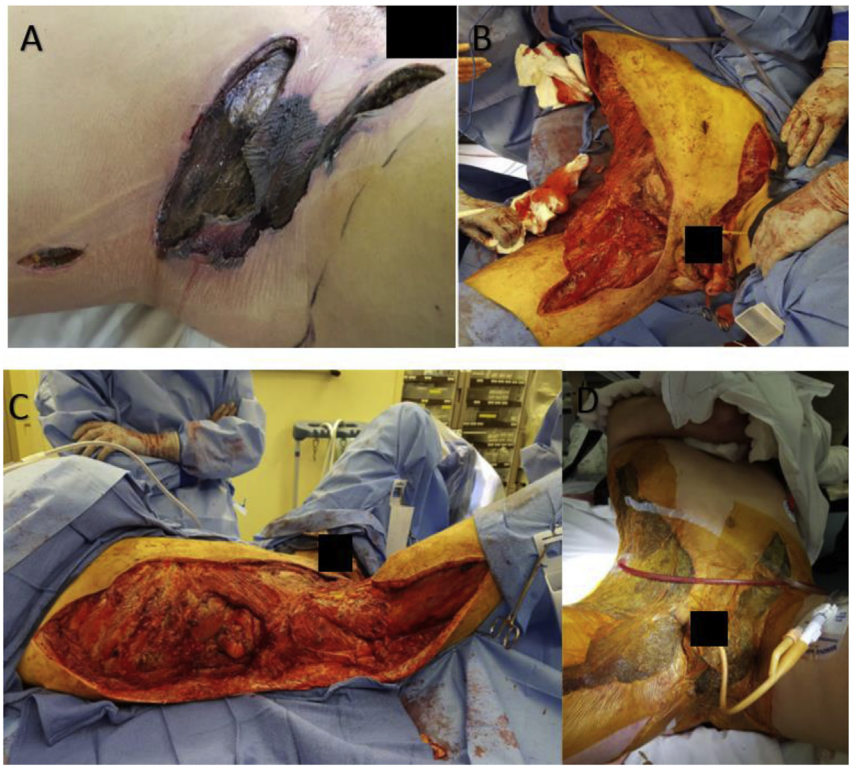

Fig. 2. Before (panel A) and after (panels B–D) initial debridement at the children's hospital.