CASE REPORT

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The acute abdomen in pregnancy and postpartum of a teenager woman. Case report

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Abstract

The acute abdomen with its many clinical aspects is not a condition that eludes pregnancy; acute appendicitis being the most frequently incriminated, but when it comes to its complication – peritonitis and the pregnant is a teenager, the cases cited in the literature are quite rare. We present the case of a 15-year-old teenager pregnant within 24 weeks admitted from the emergency department with the diagnosis of acute abdomen and operated for generalized peritonitis due to a perforated appendicitis. The microscopic analysis of the specimen indicated the presence of ulceration and extensive and deep and necrosis of the appendicle wall, the residual structures being dissected by a predominantly polymorphonuclear leukocytes inflammatory infiltrate associated with eosinophilic fibrinous deposits. Gangrenous extended necrosis of appendicle tissues, on the background of inflammatory thrombosis of appendicle vessels and mesothelium, sustained the diagnosis of acute gangrenous appendicitis. After a rather difficult evolution, she gave birth to a healthy fetus through a segmental-transverse Caesarean section at 35 gestational weeks. One week after the birth, the patient was operated for bowel obstruction by means of bridles and adherents. Both the appendicitis and the intestinal obstruction syndrome have been resolved by classic surgery. The fetal and maternal, vital and functional prognosis was good.

Keywords: acute appendicitis, peritonitis, Caesarean section, bowel obstruction.

Introduction

The acute abdomen with its many clinical aspects is not a condition that eludes pregnancy; acute appendicitis being the most frequently incriminated, but when it comes to its complication – peritonitis and the pregnant is a teenager, the cases cited in the literature are quite rare.

The frequency of acute appendicitis in pregnancy is quoted between one in 1000 pregnancies and one in 1500 births [1]. After a Danish study, the incidence of confirmed appendicitis was one to 5500 pregnancies [2].

According to Andersen & Nielsen, in their study, the incidence of appendicitis during pregnancy is estimated to be one in 766 pregnancies. The preoperative diagnosis can be accurately established in about 75% of the cases. The consequences of the appendicitis during pregnancy are very serious as four out of 12 (33%) pregnancies who underwent appendectomy in the first trimester aborted spontaneously. The second trimester appendectomy on the other hand led to premature delivery only in four out of 28 (14%) cases. Furthermore, no complications of the pregnancy were observed when the appendicitis was diagnosed during the third trimester [3].

Both topographical changes in gestation, hypervascularization in utero-pelvic territories, and hyperproliferation of progesterone, facilitate the reduction of intestinal motility, lowering the immune defense power of the mother, facilitating the risks of acute appendicitis, appendicle perforation, and acute diffuse peritonitis. In the studies of Andersson & Lambe [4] and Ueberrueck *et al.* [5], the incidence of appendicle perforation was approximately 8%, 12% and 20% in the successive trimesters.

The objective of our paper is to present a case of an acute appendicle perforation with acute diffuse peritonitis, in a 15-year-old teenager pregnant within 24 weeks. After 11 weeks from the operation, the fetus was extracted by Caesarean section, after the patient went into labor. The postoperative evolution was complicated by bowel obstruction and required surgical reintervention.

Case presentation

We present the case of a 15-year-old girl with a 24 weeks pregnancy in evolution presented in the Department of Emergency for abdominal pain, fever, vomiting, and constipation. From the obstetrical point of view, pregnancy evolution was in normal parameters. A pediatric surgery consult was requested and the diagnosis of acute appendicitis was established. The patient was admitted to the Department of Pediatric Surgery (Observation Chart No. 34469/18.08.2017) and surgery was performed finding peritoneal purulent fluid disseminated in the peritoneal

cavity, inflamed gangrenous appendix perforated at the base. The uterus and the attachments were of normal macroscopic appearance, the uterus being enlarged by volume, corresponding to a 24-week pregnancy. Appendicectomy, peritoneal toilet and broad abdominal drainage was performed and samples of peritoneal fluid for the antibiogram were taken. Postoperative evolution was favorable under antibiotic therapy, the discharge being done after eight days, with the recommendation for obstetrical follow-up. The evolution of the pregnancy and the general condition of the patient were good.

The microscopic analysis of the specimen indicated the presence of ulceration and extensive and deep and necrosis of the appendicle wall (Figure 1), the residual structures being dissected by a predominantly polymorphonuclear leukocytes inflammatory infiltrate associated with eosinophilic fibrinous deposits (Figures 2 and 4). Thus, inflammatory infiltration had a diffuse disposition, both in the submucosa and muscularis propria, including the nerve plexus and appendicle serosa. Hemorrhagic infiltration was observed predominantly at the 1/2 external wall level, and in the mesoappendix level, we found the presence of vascular microthrombosis (Figures 3 and 5). Gangrenous extended necrosis of appendicle tissues on the background of inflammatory thrombosis of appendicle vessels and mesothelium sustained the diagnosis of acute gangrenous appendicitis. In the appendicle lumen, we found alongside small-detached glandular fragments, the presence of necrotic material represented by cellular detritus, integral leukocytes and pyocytes.

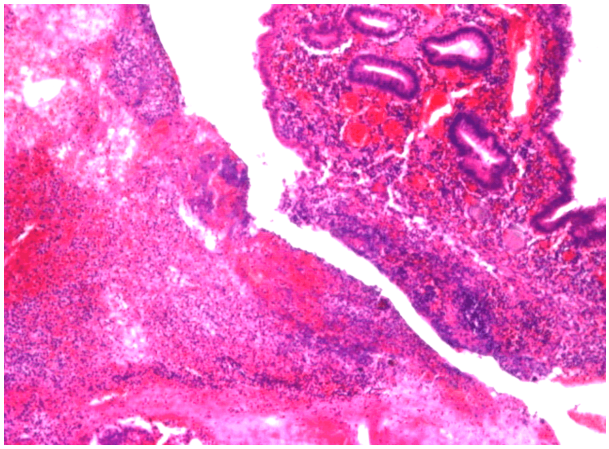

Figure 1 – ***Acute gangrenous appendicitis: ulcerated and extensively necrotized mucosa, diffuse acute inflammatory infiltration [Hematoxylin–Eosin (HE) staining, ×40].***

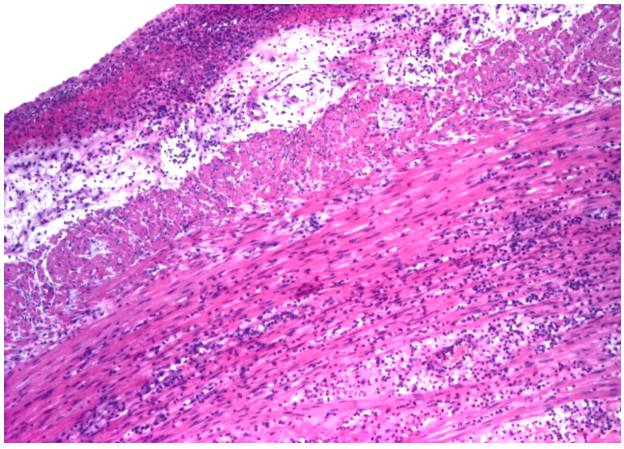

Figure 2 – ***Acute gangrenous appendicitis. The image shows the presence of an acute inflammatory infiltrate with the dissection of the wall to the mesoappendix (HE staining, ×100).***

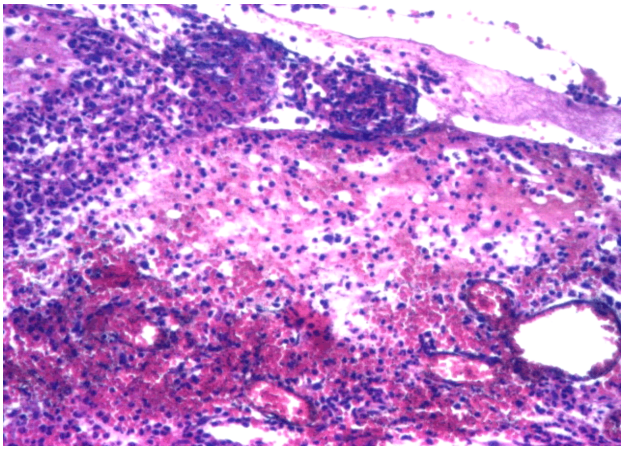

Figure 3 – ***Acute gangrenous appendicitis: mesoappendix with acute inflammatory infiltration, fibrous deposits, hemorrhagic infiltration and vascular microthrombosis (HE staining, ×200).***

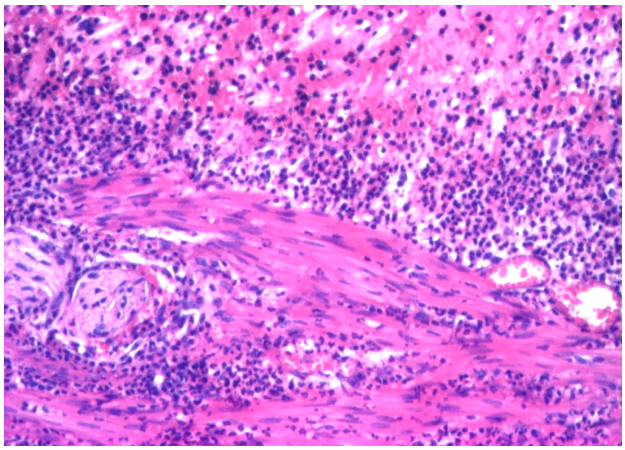

Figure 4 – ***Acute gangrenous appendicitis: muscular layer and muscular nervous plexus dissected by acute diffuse inflammatory infiltration (HE staining, ×200).***

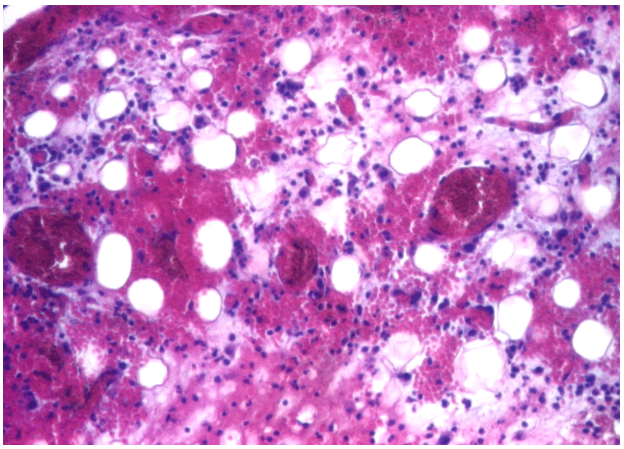

Figure 5 – ***Acute gangrenous appendicitis: peri-appendicular adipose tissue, hemorrhagic infiltration with acute inflammatory infiltration and microthrombosis (HE staining, ×200).***

Two weeks after surgery, the patient was readmitted in the Department of Pediatric Surgery for postoperative wound infection which was managed conservatively with antibiotics and daily toilet and garments (Observation Chart No. 36259/31.08.2017).

At 35 gestational weeks, the pregnant teenager presented again in the Department of Emergency for abdominal pain. Following the history, clinical examination and abdominal genital examination, it was established that the fetus is alive in cranial presentation, and the mother was in labor with intact membranes.

The patient presented painful uterine contractions every 6 minutes for 25 seconds, normal uterine tone, fetus in cranial presentation, 3 cm dilatation, intact membranes, narrow pelvis, 9 cm strain relief, the entire lengthless lines tracked, anterior arch of reduced radius, sacral curve slightly rectified, with false promontories, prominent sciatic spines, 140 beats/min fetal heart, and was admitted to the Department of Obstetrics and Gynecology (Observation Chart No. 42894/14.10.2017).

Preoperative hematological and urinary exams, electrocardiogram and obstetrical ultrasound investigations were normal, showing only anemia secondary to pregnancy, hemoglobin (Hb) 9 g/dL, hematocrit (Ht) 26.3%.

A segmental-transverse Caesarean section was performed under general anesthesia. After a transverse segmental hysterotomy, a live male baby of 2650 g and Apgar 8 was extracted. After the extraction of the placenta, the uterus retired well, the bleeding was reduced. Intraoperatively, there were numerous adhesions of the uterine body to the anterior abdominal wall. Left and right para-uterine drainage was performed with polyethylene tubes. Postoperatively, evolution was unfavorable, with nausea, vomiting, absent bowel movement. The cultures performed from the intraoperatively harvested amniotic fluid showed Methicillin-resistant *Staphylococcus aureus*, sensitive to Moxifloxacin, Avelox, Doxycycline.

Following the pediatric surgery consult, the patient was transferred to the Department of Pediatric Surgery 12 days after the birth. After approximately 12 hours of conservative management, the patient was operated for bowel obstruction by means of bridles and adherents. A median laparotomy was performed, finding numerous intestinal and omental adherences between them and abdominal wall and uterus. The uterus was inserted and of normal color, with normal annexes. Viscerolysis, adesiolysis, subtotal omentectomy, abdominal lavage with normal saline solution, and abdominal drainage with four polyethylene tubes were performed.

The patient had a favorable postoperative evolution being discharged seven days postoperatively.

Discussions

As defined in the 27th edition of *Stedman's Medical Dictionary*, acute abdomen is "any serious acute intra-abdominal condition attended by pain, tenderness, and muscular rigidity, and for which emergency surgery must be considered" [6]. Many are the clinical condition causing the acute onset of the abdominal pain, amongst them the peritonitis being one of the most frequently incriminated.

Many pathological conditions of non-obstetric origin requiring surgical intervention may occur during pregnancy, but of all these conditions, the appendicitis is considered to be the most frequent non-obstetric surgical emergency complicating the pregnancy [7].

Establishing the diagnosis of acute appendicitis during pregnancy presents many challenges, as the vomiting and the anorexia are common symptoms in many pregnancies, even uncomplicated ones. Also, the pain in the right lower-quadrant may be absent in pregnant patients with appendicitis because the cecum is displaced into the upper abdomen as the pregnancy evolves. On the other hand, the fever can be absent in many patients and the white blood cell counts could be altered as these patients have a physiological leukocytosis. For these reasons, in advanced pregnancy there are no typical clinical changes for appendicitis, often being confused with the premature birth threat, cholecystitis, pyelonephritis, renal colic, uterine fibromyoma with degeneration [8, 9].

Misdiagnosing the acute appendicitis during pregnancy can lead to an increased risk of fetal decease that ranges from 1.5% in the case of non-perforated appendicitis going up to 35–55% in the case of perforated appendicitis [10, 11].

The perforation of the appendix constitutes a major risk factor correlated with elevated fetal morbidity and mortality. Literature suggests that perforation is encountered more frequently in successive trimesters. Ueberrueck *et al.* reported an overall perforation rate of the appendix in pregnancy of 14.9% [4, 12].

The particularity of this case resides from a cumulus of factors. Acute appendicitis is an infrequent complication of the pregnancy, but of all the pathological conditions that can complicate a pregnancy it is the commonest surgical emergency, occurring in about 1:1500 pregnancies, yet to encounter a second trimester pregnancy with a perforated appendicitis and generalized peritonitis in a 15-year-old pregnant teenager is very rare [13]. Also, the fact that she was able to give birth to a normal child after the surgery and the postoperative complications developed because of the extensive abdominal infection is an important success for the combined medical team that has managed the case. She also developed an obstructive syndrome eight days after the Caesarean delivery. Both the appendectomy and the bowel obstruction syndrome have been resolved by classical surgery, once the diagnosis has been clinically established. Pelvic and abdominal ultrasound was not evident for acute perforated appendicitis, and no computed tomography (CT) imaging was performed because we tried to avoid the fetal exposure to radiation, although CT and magnetic resonance imaging (MRI) would have been much more accurate than the ultrasonography [14, 15].

Occlusive syndrome was highlighted post-Caesarean delivery, by the presence of vomiting, absence of intestinal transit, abdominal radiography providing intestinal hydroaeric images. From the surgical point of view, the evolution was difficult the patient presenting a suppurative parietal complication two weeks after the surgical intervention for acute appendicitis, and then a bowel obstruction one week after the birth.

From the obstetrical point of view, thing were more fortunate, the patient giving birth to a healthy child at 35 weeks of gestation through Caesarean section. The medical literature often quotes the risks of acute appendicitis and acute peritonitis especially for the fetus such as low birth weight, between 11% and 23%, and premature birth 1.5–2 times higher [16]. Another element that could be brought into discussion in this case is the subsequent infertility of this 15-year-old patient. After some studies, acute complications such as peritonitis and bowel obstruction do not seem to be followed by secondary sterility [17, 18]. A possible association between sepsis and neonatal neurological suffering has not been verified in practice [19]. In the presented case, the fetal prognosis was good, and the child's neurological evolution is to be followed in the future.

The pregnancy in teenagers constitutes a major public health issue. The lack of physiological maturity impairs the obstetric and perinatal outcomes. The marriage from the small ages, the lack of education (unaware of the contraception methods) and the poor social and economic status are all related with an increasing rate of adolescent pregnancy [20, 21].

The *United Nations Children's Fund* (UNICEF) defines teenage pregnancy as a pregnancy occurring between the ages of 13–19 years old. In general acceptance, the term of teenage pregnancy is often employed to describe any pregnancy in a young woman who has not yet reached the legal adulthood, but this age varies across the world [22].

According to the *Office for National Statistics from UK*, which has collated data with the assistance of the *Eurostat* database, Romania occupies the second place between the European nations after Bulgaria, regarding the number of live births/1000 women aged 15 to 17 in 2014 [23].

Adolescents are more likely to give birth before the term and in general, the girls less than 17 years old give birth to low birth weight babies. Nevertheless, this does not mean that these babies have a worse neonatal outcome. On the other hand, the teenagers have lower rates of maternal morbidity, and obstetric interventions and they are present more often-spontaneous vaginal delivery [24, 25]. In the presented case, the local obstetrical conditions – narrow birth canal, and extensive abdominal scars did not allow spontaneous vaginal delivery and it was decided to extract the fetus by Caesarean section.

Conclusions

Acute appendicitis complicated with peritonitis and bowel obstruction in pregnancy is a pathology quite rarely encountered in practice. The positive diagnosis is eminently clinical, especially as the presence of pregnancy and the fetus is contraindicating a series of imaging investigations. The symptoms presented by the patient are somehow "masked" by the presence of the pregnant uterus. The case we are presenting is a very particular one not only because of the age of our pregnant patient but also due to this severe complication we have encountered, and which presented a big challenge both for the pediatric surgeons and for the obstetricians.

Conflict of interests

The authors declare that they have no conflict of interests.

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