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CASE REPORT

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Acute Uncomplicated Appendicitis with Right-Sided Hydroureteronephrosis in Pregnancy

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Abstract

Diagnosing acute appendicitis during pregnancy remains a challenge. However, it is important to rapidly make a diagnosis in order to avoid complications. History and clinical examination are crucial. Ultrasound is the technical examination of first choice, when it remains inconclusive, MR imaging is indicated.

When hydroureteronephrosis is seen at ultrasound, it may be physiological during pregnancy, but when severe and right-sided, it can be the result of an acute appendicitis. When this is seen on ultrasound, the threshold to carry out a diagnostic laparoscopy must be reduced.

Keywords: *Pregnancy complication, Appendicitis, Hydroureteronephrosis, Laparoscopy*

Introduction

One in 1700 pregnancies is complicated by acute appendicitis. This makes appendicitis the most common non obstetric cause of acute abdomen and indication for surgical intervention during pregnancy [1]. Pregnancy is associated with anatomical and physiological changes which can disguise an acute appendicitis. These changes and pelvic ultrasound which often remains inconclusive, makes the differential diagnosis difficult to make. Due to the delay of the diagnosis and due to the immunosuppression of pregnancy, appendicitis is in 43% complicated with perforation, compared with 4% to 19% in general population [2].

When a right-sided hydroureteronephrosis is present, the differential diagnosis is even more complex. Dilatation of the upper urinary tract must be seen as a physiological condition during pregnancy. However, it is peculiar when a pronounced unilaterally hydroureteronephrosis is seen without a cause other than the growing uterus [3]. Rarely a right-sided hydronephrosis is seen as a primary finding in uncomplicated appendicitis [4].

We present a case of a 22-year old woman at 33 weeks gestational age who presents with right-sided abdominal pain. A severe right-sided hydroureteronephrosis was seen and appeared to be a sign of an acute appendicitis.

Case

A 22-year-old G0 woman at 33 weeks gesta¬tional age reported to the emergency department with sudden pain in the right iliac fossa and right flank without prodromes. The patient indicated to be nauseous without vomiting and her appetite was moderate. Her stool was normal. Physical examination revealed pressure pain in the right iliac fossa and flank, right-sided costovertebral tenderness and a high reaching uterus. Vital signs were normal. Laboratory results provided sedimentation rate of 46mm (0-11mm), white cell count of 17.99x10^3/µl (4.00-11.00x10^3/µl) with a normal formula, creatinine 0.42mg/dl (0.44-1.03mg/dl). Other routine laboratory parameters were normal. Urin analysis demonstrated pyuria and bacteriuria (+++) on the urinary sediment andhematuria (+) and leucocytes (+++) on dipstick. Pelvic ultrasound showed the fetus in utero. Signs of inflammatory wall thickening of the caecum, free fluid and enlarged mesenteric lymph nodes were absent. The appendix could not be visualized. Renal and bladder ultrasound showed right-sided hydroureteronephrosis. After consulting an abdominal surgeon, it was decided to hospitalize the patient and initiate a therapy with IV cefazoline 2g/day to prevent or treat peylonephritis, but no surgery was scheduled at this point. The next day a new blood sample showed an increasing white cell count of 22.27x10^3/µl and CRP of 10.2mg/l (<7.5mg/l). Renewed ultrasound confirmed the right-sided hydroureteronephrosis and failed again to visualize the appendix. An urgent MRI scan was performed. This showed a thickened, retrocecal, possibly retroperitoneal appendix and pericecal lymph node thickening. After consultation, it was decided to perform a laparoscopic appendectomy. Peroperatively an inflamed retrocecal appendix was visualized and removed without complications. Postoperatively the patient did well and was released on postoperative day two. Anatomopathological examination showed an acute purulent and focal necrotizing appendicitis and peri appendicitis without arguments for malignancy. At control consultation after three weeks patient felt good, had a normal appetite and a normal micturition and defecation pattern. Pregnancy evolved uneventful. Remarkably, her sister was also operated due to an acute appendicitis in her first pregnancy at 8 weeks gestational time.

Discussion

Diagnosis of appendicitis is difficult during pregnancy because the clinical presentation often varies [2] and many classic symptoms are considered to be normal during pregnancy [5,6]. Right-sided abdominal pain remains the cardinal sign. Leukocytosis and low-level fever, which are important indicators in the non-pregnant state, are less reliable for diagnosis during pregnancy [2]. Many different causes need to be considered in the differential diagnosis. These causes can be obstetrical or gynecological, but there are also other causes as shown in table 1, Figure 1.

History and clinical examination are very important in the diagnosis of appendicitis during pregnancy [2]. Ultrasound examination is the first imaging modality of choice. This technique, however, has its limitations so the appendix can often not be adequately assessed. In that case, MR imaging is recommended because of its safety, its high negative predictive value and its potential to find alternative causes for the right-sided abdominal pain [7].

When hydroureteronephrosis is seen during a technical examination, the differential diagnosis can be extended. Hydronephrosis is considered as a physiological feature during pregnancy. It occurs in up to 80% of pregnancies and is most pronounced in primigravida. It can be demonstrated by ultrasound, most often from the second trimester onwards and it may be present until the 12th postpartum week. Severe dilatation is rare [3]. The dilatation is caused by the dilatation effect of progesterone and mechanical compression of the enlarging uterus on the ureters where they cross the iliac vessels at the level of the linea terminalis. It is more frequently observed on the right side. The unequal degree of dilatation may result from protection provided by the sigmoid colon and dextrorotation of the uterus [8].

The association between maternal hydro¬nephrosis and flank pain symptoms is rare [9]. However, when a pregnant patient presents with flank pain and hydronephrosis, coexisting stone disease, pyeolonephritis and renal disease should be excluded [10]. In this patient stone disease was excluded with ultrasound. Renal disease was excluded since the laboratory results showed a normal renal function. Although a urinary tract infection was present, this could not fully explain her symptoms as her clinical condition deteriorated and infectious parameters continued to rise despite therapy with cefazolin.

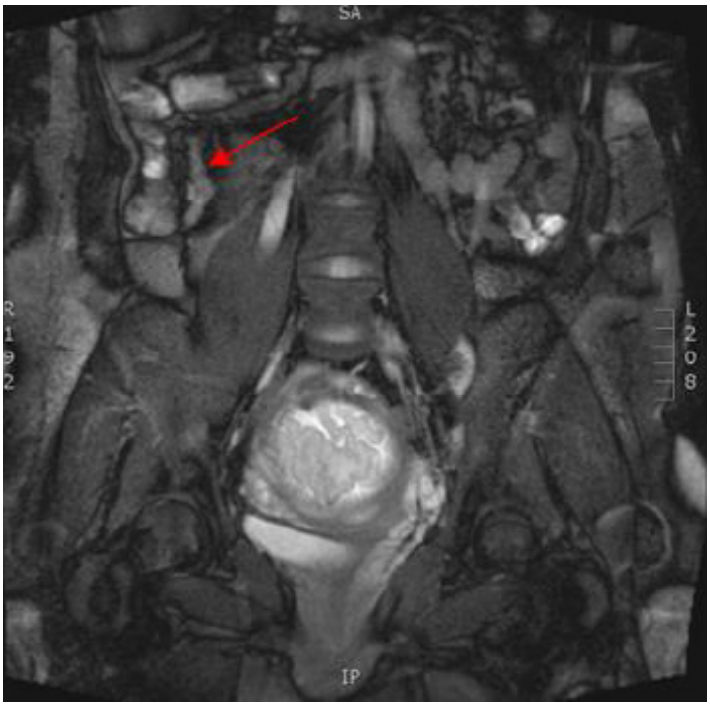

Figure 1. High reaching T2 hyperintense appendix situated parallel to the internal board of the cecum in the right hypochondriac region: 7 mm in diameter.

Table 1. Obstetrical, gynecological and other causes of right lower quadrant pain in pregnancy [6].

Obstetrical and gynecological causes	Other causes
Ruptured ovarian cyst	Gastroenteritis
Hemorrhagic ovarian cyst	Urinary tract infection
Appendicitis	Pyelonephritis
Idiopathic	Cholecystitis
Ectopic pregnancy	Cholelithiasis
Ovarian torsion	Pancreatitis
Pelvic inflammatory disease	Nephrolithiasis
Tubo-ovarian abscess	Hernia
Threatened abortion	Bowel obstruction
Placental abruption	Carcinoma of the large
Chorioamnionitis	bowel
Degenerating leiomyoma	Mesenteric adenitis
Ventral hernia	Rectus hematoma
Pyelonephritis	Pulmonary embolism
Salpingitis	Right-lower-lobe
Adnexal torsion	pneumonia
Ruptured corpus luteum cyst	Sickle cell disease
Round ligament syndrome	
Preeclampsia	

Unilateral right-sided hydronephrosis can rarely be seen as a finding in appendicitis. It has recently been described for the first time by Schok, et al. [4]. As the appendix in our patient was located retrocecally, the hydroureteronephrosis could be related with the anatomical relationship of the appendix and the right ureter. According to the hypothesis of Schok, et al. the increasing inflammation along the parietal peritoneum leads to a segmental paresis of the ureter, a mechanism comparable to an ileus of the intestine [4]. So when a severe right-sided hydroureteronephrosis is seen in a pregnant woman with right-sided abdominal pain, one should always consider an acute appendicitis.

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