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RETROCECAL APPENDICITIS AFTER ELECTIVE CAESAREAN SECTION

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Abstract

Introduction: Ruptured retrocecal appendicitis can occur after cesarean section, leading to significant maternal morbidity. The optimal management for postpartal women in this situation remains unclear.

Case Presentation: A 29-year-old nulliparous woman at 39 weeks gestation underwent an elective cesarean section. Postoperatively, she developed fever and abdominal pain. Despite initial conservative management, her condition worsened, leading to a diagnosis of ruptured retrocecal appendicitis.

Discussion: This case highlights the challenges of diagnosing appendicitis in the postpartum period. While surgical intervention is almost always necessary, the timing and extent of surgery can be influenced by various factors, including the stage of postpartum period and the severity of the appendicitis. Further research is needed to establish evidence-based guidelines for managing this condition in postpartum women.

***Keywords**:* retrocecal appendicitis, cesarean section, postpartum, maternal morbidity.

Introduction

Appendicitis is the most common acute abdominal complication during pregnancy. It occurs in 1/2,000 to 1/500 pregnancies [2], and it is exceedingly rare in the third trimester, possibly due to the protective effects of hormonal and immunological changes during pregnancy [1].

During pregnancy, if not (partly) fixed or retroperitoneal, the appendix is slightly displaced upwards due to the growing uterus, especially in the second and third trimesters. Still, it returns to its previous location just 10 days after delivery [3].

Many studies have shown that acute appendicitis (AA) during pregnancy can result in preterm delivery, while fetal loss is significant after perforated AA [4,5]. However, due to the low number of cases in the literature, the significance of the relationship between appendectomy for AA and pregnancy complications and delivery outcomes is misinterpreted [6].

Infections that occur after childbirth are often attributable to pregnancy or delivery complications [7]. However, it is important to consider other potential causes, including appendicitis. While appendicitis is a common reason for surgery during pregnancy, cases in the immediate postpartum period are less frequent [8].

Acute appendicitis is the most common non urogenital acute condition that occurs after childbirth. It is also the most frequent reason for women to be readmitted to the hospital after giving birth [9], but still in the literature there are not many cases published.

This case-report highlights the importance of considering appendicitis as a possible diagnosis in postpartum patients with acute abdomen, especially when there is no other clear source of infection. A multidisciplinary approach involving experienced obstetricians and surgeons can help reduce serious complications associated with delayed diagnosis.

CASE

A 29-year-old nulliparous woman at 39 weeks gestation, with a BMI of 41 and an estimated fetal weight of 4,500 g, was admitted to the obstetric department in the private hospital ‘Plodnost’ for elective cesarean section.

Prior to the cesarean section, comprehensive laboratory and clinical evaluations were conducted in accordance with established hospital protocols. These assessments consisted of routine

blood tests, vital signs monitoring and a thorough physical examination. All results and findings were within normal reference ranges, indicating the patient's overall health and readiness for the surgical procedure. Ceftriaxone 2 g were given intravenously one hour before surgery as a preoperative antibiotic prophylaxis

The cesarean section was performed under spinal anesthesia. The procedure was carried out without any complications, and the patient delivered a healthy female neonate weighing 4,500 g with an APGAR score of 8/9 at the first and fifth minute.

The early postpartum period was uneventful, with the patient experiencing regular bowel movements on the second post-caesarean day, indicating that her digestive system had regained normal function..Breastfeeding was successfully established, allowing the patient to provide her newborn with essential nutrients.

The patient's recovery was smooth, and she was discharged from the hospital on the fourth post-caesarean day in good general wellbeing. The incision wound had healed, and the patient demonstrated no signs of infection or other complications.

On the 4th day after the cesarean section (SC), at home, after being discharged from the hospital, the patient began to experience fever episodes, reaching 38 degrees Celsius twice daily. She self-treated her fever by taking over-the-counter oral paracetamol tablets, 500 mg, 6-hourly, without consulting her doctor for two days.

In the morning on the 6th day following the SC, the patient experienced a sudden, sharp pain in her right lower abdomen that only lasted for a few minutes. Two hours later, she sought medical attention at the hospital, where she complained of a dull, persistent pain in the same area.

Upon readmission, the patient's temperature was elevated to 38.7 degrees Celsius, and she exhibited right lower abdominal pain without any of the typical signs of acute appendicitis. Additionally, she reported a decrease in flatulence and bowel movements.

Imaging studies were performed to further investigate the cause of the patient's abdominal pain. An abdominal and pelvic ultrasound revealed no abnormalities. Additionally, a plain abdominal X-ray did not show any signs of pneumoperitoneum or intestinal obstruction.

Laboratory tests were conducted to assess the patient's inflammatory response. The erythrocyte sedimentation rate (ESR) was elevated at 90 mm/hour, and the C-reactive protein (CRP) level was significantly increased at 160.5 mg/L. The white blood cell count (WBC) was also elevated at 19.1 x 10^9/L, indicating acute inflammation and infection.

Based on the patient's clinical presentation, laboratory findings, and imaging results, a working diagnosis of local right pelvic peritonitis was established. This diagnosis suggested that the inflammation and infection were localized to the right pelvic region.

To address the infection, the patient was prescribed a combination of three intravenous antibiotics:

Ceftriaxone 2g, every 12 hours,

Metronidazole 500mg, every 8 hours,

Gentamicin 240mg, every 24 hours.

Renal function and liver function test were performed before initiating the triple antibiotic therapy, to asses the need for renal/hepatic dosage adjustment of the medications. No pharmacological intervention was needed.

On the 7th day following the SC, in the morning, the triple antibiotics regimen was continued, she was not complaining of any pain, she was afebrile, feeling well, eating and having liquid bowel movements, but during the night, 24 hours from the last fever episode, she had again fever of 38.1 degrees Celsius, and an intravenous antipyretic (Metamizole 2,5 g) was administered. Laboratory findings were notable for a WBC of13,26 x10^3/µL, CRP of 164.0mg/l and ESR of110/hour.

During the 8th day following the SC, in the morning, triple antibiotics were continued, during the day she was not complaining of any pain, she was feeling well, eating and having liquid stool, but during the night, 24 hours from the last fever episode, she had fever of 38.1 degrees Celsiusagain and antipyretic (Metamizole 2.5g, intravenously) was administered. WBC was 3.71x10^3/µL, CRP 170.0mg/l, ESR 105/hour. Procalcitonin levels were 0.81 ng/ml. The dynamics of the inflammatory markers during the hospital period are described in Table. 1.

Table 1. Inflammatory markers and triple antibiotic therapy

	Inflamatory markers		
Day after SC	WBC (x10^3/μL)	CRP (mg/L)	ESR (mm/h)
6	19,1	160.5	90
7	13,2	1 64	110
8	3,7	170	105

Before she had the increment of the temperature, after 24 hours after last fever episode, she started to complain of a dull pain in the right lower abdomen and she was transported to the surgery department in clinical hospital 'Dr. Trifun Panovski' in Bitola, where a diagnosis of appendicitis was made, based on a clinical examination and a decision for immediate surgery was brought.

The surgery was performed via laparotomy and a ruptured retrocecal appendicitis (Fig.1) was found with an appendicolith (Fig.2) present inside the appendix. Appendectomy and cleaning of the retrocecal abscess was performed (Fig.3) followed by lavage and placement of a drainage at the surgical site and the wound was sutured. The woman was discharged from the hospital after 2 days.

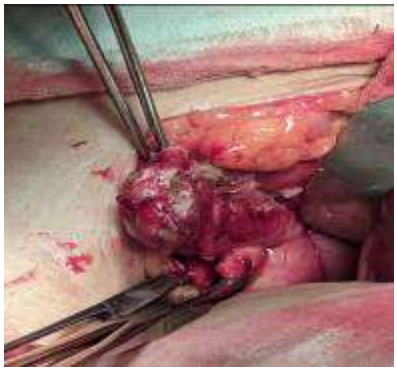

Fig.1. Ruptured retrocecal appendicitis specimen

Fig.2. Appendicolith

Fig.3.Appendectomy

Discussion

While appendicitis is a relatively common complication during pregnancy, there is a lack of data in the literature on its occurrence in the immediate postpartum period, especially about appendicitis following caesarean section. Postpartum appendicitis, especially appendicitis after caesarean section, can be challenging to diagnose, due to its atypical presentation, which can mimic other common postpartum conditions.

In Medline, most of the literature consists of case reports and there is only one published cross-sectional retrospective study performed on 11,513 women, that had given birth between 2015–2020, of whom 32 patients underwent appendectomy: 12 during pregnancy and 20 women during the puerperium period. Seven puerperal women had a vaginal birth, and 13 puerperal women had CS. Eight women (40% of all puerperal appendectomies) had been operated on during the first postpartum week. Two of them had a vaginal birth, and six had CS. Two cases (25% of women who had undergone appendectomy during the first week) that had undergone surgery during the first

postpartum week were diagnosed with perforated AA. Most women who had had an appendectomy during puerperium had a CS (58 vs. 65%, p = 0.706) [9].

In our hospital, we have had significantly fewer cases of appendicitis in the early postpartum period compared to the previous study.

While there have been 4,666 deliveries at our facility during the period 2010-2024, we have only encountered one case of appendicitis, whereas the authors in the previous study had 32 cases among 11,513 deliveries.

As it can be seen from Table. 1 all three inflammatory markers (WBC, CRP, ESR) were significantly elevated on day 6, indicating a robust inflammatory response. Triple antibiotic therapy was initiated at day 6 and the WBC count decreased markedly from day 6 to day 8, suggesting a reduction in the overall inflammatory response, but despite the decrease in WBC, both CRP and ESR remained elevated, indicating an ongoing inflammation or the development of a new inflammatory process.

The patient's recurrent fevers, which occurred every 24 hours despite the triple antibiotic therapy, also suggested that the inflammatory process was ongoing.

Puerperal women may associate their complaints, including localized pain, with the recent CS. Also, analgesics can mask or diminish the severity of the linical presentation. Therefore, these factors could partly explain the delay in diagnosis and treatment and the high incidence of perforated AA in this monitored group [9].

Concerning this evidence, any foci of infection that may develop due to a lack of compliance with asepsis during CS (open abdominal operation) and lack of preoperative antibiotic prophylaxisy or invasion of the amnion fluid may lead to AA. It is difficult to root the cause of AA. It could be AA (which starts from the appendiceal mucosa) or periappendicitis when a surrounding infection spreads to the appendix.

Another potential cause of post-CS AA could be the change in the location of the appendix during intraoperative uterine manipulation. If the appendix is partly fixed, manipulation can cause kinking producing partial or complete obstruction of the appendiceal lumen eventually resulting in AA.

Healthcare providers should maintain a high index of suspicion for appendicitis in postpartum women, especially those with abdominal pain or other concerning symptoms. Patients with suspected appendicitis should undergo prompt evaluation, including physical examination by a surgeon, laboratory tests, and imaging studies. If appendicitis is diagnosed, early surgical intervention is crucial to prevent complications and improve outcomes.

More studies are needed to investigate the incidence, risk factors, and clinical presentation of appendicitis in the postpartum period. Research should focus on developing more accurate and sensitive diagnostic tools for postpartum appendicitis.

Identifying risk factors for postpartum appendicitis could lead to the development of preventive measures. Such factors could be categorized as: Hormonal changes: the hormonal fluctuations that occur during and after pregnancy can influence the development and presentation of appendicitis.

Weakened immune system: postpartum women may have a weakened immune system, making them more susceptible to infections like appendicitis; anatomical changes: the anatomical changes that occur during pregnancy and delivery might affect the positioning and function of the appendix; delayed diagnosis: the delayed diagnosis of postpartum appendicitis can lead to an increased rate of complications, such as perforation and sepsis.

Conclusion

Appendicitis in the postpartum period remains a relatively understudied area, but its potential for serious complications highlights the importance of early diagnosis and treatment. Further research is necessary to improve our understanding of this condition and to help develop effective strategies for prevention and management

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