CASE REPORT

Laparoscopic appendicectomy during pregnancy: a case report

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ABSTRACT

The decision to operate on a pregnant patient can be very challenging due to risk of diagnostic and therapeutic modalities harming both mother and the fetus. Abdominal pain in a gravid patient can be due to non-obstetric causes and commonly surgery might be required. Controversy over contraindication of laparoscopic surgery due to fetal injury during trocar placement and fetal malperfusion from pneumoperitoneum existed in the past. The approach to the pregnant patient with a surgical emergency has changed in recent years. We present the case of a patient in her second trimester of pregnancy who had a laparoscopic appendicectomy, and a review of the current literature.

Keywords: Laparoscopic appendicectomy, pregnancy, non-obstetric abdominal pain

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INTRODUCTION

Diagnosis and treatment of the acute abdomen during pregnancy can be challenging but follows the same principles as for non-pregnant patients with slight variations. The two commonest non-obstetric causes of acute abdominal pain that require surgery are acute appendicitis and acute cholecystitis. We present the case of a 24-year-old patient during her 14th week of pregnancy who presented with abdominal pain. She was treated conservatively initially but her condition worsened, and she was later taken to the operating theatre for a diagnostic laparoscopy. A laparoscopic appendicectomy was performed.

CASE PRESENTATION

A 24-year-old female Caucasian patient presented to the emergency department due to abdominal pain. She was pregnant with her third child but had not been monitored by a gynaecologist. Ultrasound later showed she was approximately in her 14th week of pregnancy. Her history was unremarkable, and she denied taking any medication or having any surgeries. Her 2 children were delivered

naturally. Her pain was focused mainly in the right iliac fossa and had started gradually as a generalised pain 8 hours earlier. She felt weak and had nausea.

On presentation she was afebrile with normal vital signs. Clinical examination revealed a tender lower abdomen, mainly on the right side, accompanied by guarding and localised rebound tenderness. The obstetrical examination was normal. An abdominal ultrasound was performed without specific findings. A small amount of free fluid was seen in the right iliac fossa. Her blood examinations revealed a normal white blood cell count (WBC) and a mildly elevated C-reactive protein (CRP).

A decision was made to treat a possible acute appendicitis conservatively with intravenous fluids and antibiotics (co-amoxiclav 1.2 gr BD). Nonetheless, the patient's condition deteriorated over night. Her pain had worsened, and her bloods showed an elevated WBC count and raised CRP. It was decided to take the patient to the operating theatre to perform a diagnostic laparoscopy.

An open Hasson technique was performed with the insertion of an 11 mm trocar just above the umbilicus. Inspection of the abdominal cavity revealed a normal gravid uterus and a gangrenous appendix with localised pus in the right iliac fossa. 2 further 5 mm ports were inserted, one suprapubically and the other in the right abdomen at the level of the umbilicus, in order to achieve triangulation. A typical laparoscopic appendicectomy was followed with ligation of the appendiceal stump and the mesoappendix with Vicryl 0 endoloops. The right iliac fossa was dried with swabs and no lavage of the area was performed. No drains were placed.

The patient recovered well, and her pregnancy was uneventful. She was discharged on post-op day 2 with oral antibiotics. She had a good recovery and was followed up at 1, 6 and 9 months without pathology. She delivered her baby normally at 40 weeks, without any complications.

COMMENT

Acute abdominal pain in the pregnant patient is a symptom that can be very challenging for clinicians. In the differential diagnosis, two main categories of pathology exist, obstetric or non-obstetric causes of abdominal pain. The two commonest non-obstetric causes of acute abdominal pain that require surgery are acute appendicitis and acute cholecystitis [1]. Other causes include ovarian cysts, masses, or torsion, symptomatic cholelithiasis, adrenal tumors, splenic disorders, symptomatic hernias, complications of inflammatory bowel disease and other rare causes [1].

Diagnosis and treatment of the acute abdomen during pregnancy follow the same principles as for non-pregnant patients but with slight variations. Physiological and anatomical changes occur normally during pregnancy. Anemia, leucocytosis, tachycardia, constipation nausea and vomiting, and mild abdominal pain are common during normal pregnancy and can cause dilemma in the diagnosis. In addition, the displacement of the appendix in a more cephalad position due to the increased size of

the gravid uterus, can make the diagnosis even more challenging.

Accurate diagnosis and appropriate treatment are crucial for an acceptable outcome. In general, the outcome of the fetus depends greatly on the outcome of the mother. In addition to history, clinical examination and laboratory tests, imaging is often very useful in making the correct diagnosis. Ultrasound is the initial examination of choice. This test is safe and effective and can be used to differentiate from other causes of abdominal pain, gynaecological or on-gynaecological in nature. Magnetic Resonance Imaging (MRI) is also a useful tool in the pregnant patient. Intravenous contrast (gadolinium) should be avoided as it can cause teratogenesis. This advanced diagnostic examination is preferred to Computed Tomography (CT) which has radiation exposure to the fetus, which in turn causes teratogenesis and leukaemia. If MRI is not available, CT can be used in emergency situations, when other diagnostic tools are insufficient [2].

A negative appendicectomy, the finding of a grossly normal appendix during diagnostic laparoscopy or laparotomy for presumed acute appendicitis, is higher in pregnant compared to non-pregnant patients. The percentage of this finding can be up to 30% of cases. [3,4]

Although the safety of laparoscopic appendicectomy, especially during the first and second trimester, are still a subject of debate, this technique has become the gold standard in our days [1, 3]. Several large systematic reviews and meta-analyses have concluded that laparoscopic appendicectomy can be associated with a greater risk of fetal loss and complications during pregnancy [3-6]. The risk of fetal loss can be as high as 23%, even in negative appendicectomy cases [7]. A reduced gestational age in laparoscopic appendicectomy when compared to open appendicectomy is also seen. As a result, it is believed that pneumoperitoneum and carbon dioxide diffusion into the maternal bloodstream is responsible for these poor results [8,9].

Pulmonary physiology is restricted during pregnancy with a decreased residual lung volume and end functional residual capacity due to upward displacement of the diaphragm. This can be worsened with pneumoperitoneum during laparoscopy. An insufflation pressure of 10-15 mmHg is recommended in order to have adequate visualisation of the peritoneal cavity and without causing adverse effects on mother and fetus. Fetal acidosis and associated fetal instability due to CO2 pneumoperitoneum was once a concern and maternal capnography monitoring has since been recommended [9]. The risk of deep vein thrombosis in the already hypercoagulable state of the pregnant patient is increased during laparoscopy. Intra and post op pneumatic compression devices and early postoperative ambulation are strongly recommended in these cases.

Acute cholecystitis (AC) and acute appendicitis (AA) are the two most common causes of emergency surgery during pregnancy [2]. The symptoms of these two pathologies along with early symptoms of pregnancy often overlap. The natural history of AA and AC is to go from an uncomplicated to a complicated

state with the ultimate event of perforation in both organs. Spontaneous resolution of both infections is not uncommon. Furthermore, the role of non-operative management, giving intravenous antibiotics and postponing surgery until after delivery, has emerged and has become a popular option during pregnancy. In AA, the success rate of non-operative management is approximately 63% at 1 year, meaning no further recurrences of AA within a year [10, 11]. Nonetheless, surgery is the first-line therapy in both complicated and uncomplicated appendicitis and should be offered to all patients [12].

Non-operative management is often opted but can be unsuccessful, especially in cases of complicated appendicitis. Up to 74 % of cases of complicated appendicitis will subsequently require operative treatment during the same hospital stay [12]. Immediate operation was associated with lower odds of maternal infectious complications, including amniotic infection, pneumonia, and sepsis, compared with successful and unsuccessful nonoperative management, with no association with odds of preterm delivery, preterm labour, or abortion or with antepartum haemorrhage [12].

Patient positioning in pregnancy plays a significant role during surgery. The gravid uterus applies pressure to the inferior vena cava reducing venous blood return to the heart. Consequently, cardiac output is also reduced, and placental perfusion and maternal blood pressure is affected. Therefore, the left lateral decubitus position is preferred in the second and third trimesters of pregnancy, improving cardiac output. This will also help in visualising the appendix. In the first trimester, the uterus is usually not large enough to compromise venous return [2].

Peritoneal entry and trocar positioning in laparoscopy is also modified during pregnancy and depends greatly on the size of the uterus. Both open (Hasson) and closed (Veress and optical entry) techniques can be used safely if the abdominal wall is lifted and port entry is adjusted according to fundal height [13]. The uterus fundus is usually at the level of the umbilicus at week 20 of pregnancy. Entry at this level should be avoided in the second and third trimester. The Lee-Huang point, the midpoint between the xiphoid process and the umbilicus, allows high central vision, avoiding trocar insertion near the umbilicus [13]. Palmer's point (left subcostal) is also considered a safe option. Ultrasound guided port insertion has also been described as an additional safeguard to prevent uterine injury.

CONCLUSION

Diagnosis and treatment of the acute abdomen during pregnancy can be challenging but follows the same principles as for non-pregnant patients with slight variations. In general, the outcome of the fetus depends greatly on the outcome of the mother. There is a high risk of maternal and fetal morbidity if diagnosis is delayed. Surgery itself also carries a risk. Accurate diagnosis and appropriate treatment are crucial for an acceptable outcome. Surgery should be offered with caution but without delay. Patient positioning, peritoneal

entry and trocar positioning in laparoscopy are modified during pregnancy.

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ΠΑΡΟΥΣΙΑΣΗ ΠΕΡΙΣΤΑΤΙΚΟΥ

Λαπαροσκοπική σκωληκοειδεκτομή στην κύηση: παρουσίαση περιστατικού

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ΠΕΡΙΛΗΨΗ

Η απόφαση για χειρουργική θεραπεία σε έγκυο ασθενή μπορεί να φέρει διλήμματα διότι η διαγνωστικές μεθόδους και η θεραπευτικές επιλογές φέρουν ρίσκο και για την μητέρα και για το έμβρυο. Το κοιλιακό άλγος στην έγκυο ασθενή μπορεί να οφείλεται σε μη-μαιευτικές αιτίες και η χειρουργική αντιμετώπιση μπορεί να είναι απαραίτητη. Στο παρελθόν, υπήρχε αντιπαράθεση σχετικά με την ασφάλεια της λαπαροσκόπησης. Ο τραυματισμός του εμβρύου κατά την τοποθέτηση των trocar και διαταραχές αιμάτωσης του εμβρύου από το πνευμοπεριτοναίου θεωρούνταν συχνά. Η προσέγγιση της εγκύου ασθενούς με χειρουργική παθολογία έχει αλλάξει τα τελευταία έτη. Παρουσιάζουμε την περίπτωση μίας ασθενούς στο δεύτερο τρίμηνο της εγκυμοσύνης που χειρουργήθηκε με λαπαροσκοπική σκωληκοειδεκτομή και περίληψη της τρέχουσας βιβλιογραφίας.

Λέξεις ευρετηρίου: λαπαροσκοπική σκωληκοειδεκτομή, κύηση, μη μαιευτικό κοιλιακό άλγος

Α. Αποστολόπουλος, Α. Μαρίνης, Ε. Δημητρίου, Ι. Σιάννης, Κ. Νεοκλέους, Β. Τσαμτσουκάκης, Π. Κοζώνη, Γ. Αγιομαμίτης. Λαπαροσκοπική σκωληκοειδεκτομή στην κύηση: παρουσίαση περιστατικού. Επιστημονικά Χρονικά 2022; 27(4): 592-597

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