

Surgical Management of Non-Obstetric Acute Abdomen During Pregnancy: A Retrospective Review of 24 Cases After 8-Years' Experience

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OBJECTIVES: Diagnosis and management of non-obstetric acute abdomen during pregnancy is a cause of concern both for the obstetricians and the general surgeons. A resistance against operation during pregnancy leads to unnecessary delay which may increase both maternal and fetal morbidity, even mortality. In this study we present our experience in surgical management of pregnant patients with non-obstetric acute abdomen.

STUDY DESIGN: Pregnant patients with acute abdomen requiring surgical exploration were enrolled from 2004 to 2012. Women were excluded from the analysis if the surgical procedure was obstetric in nature. Demographics, gestational age, symptoms, operative results, postoperative complications, pregnancy outcome and imaging studies were assessed.

RESULTS: There were 24 patients with a mean age of 28,25±3.51 years. Operations are often performed in the second trimester. Most common symptoms were abdominal pain (100%) and nausea (83%). Ovarian torsion and appendicitis were the most common etiologies causing non-obstetrical acute abdomen (33% and 25%, respectively). All patients tolerated surgery well, 11 of them had no postoperative complications, however 3 fetal losses, 4 preterm deliveries, 3 PPRM, 1 re-operation and 1 vaginal bleeding were observed. One patient died from acute respiratory distress syndrome in the 24th day of the surgery. Ultrasonography was performed in 22 patients, MR imaging was used in 11 patients. Sonographic findings were diagnostic in 59%, while MR was successful in assigning the correct diagnosis in 100%.

CONCLUSIONS: The issue of surgical management of non-obstetric acute abdomen during pregnancy is an important concern for clinicians who care women. Prompt diagnosis and appropriate surgical approach are the cornerstones of the management. Due to the diagnostic limitations of ultrasonography, MR imaging has become increasingly popular and gave direction to management strategy.

Key Words: Acute abdomen, Pregnancy, Non-obstetric surgery, Ultrasonography, MR imaging

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Introduction

Acute abdomen is still a challenge for clinicians who care for pregnant women. Despite advances in imaging techniques, definitive diagnosis of acute abdomen during pregnancy remains blurred until surgical exploration. Besides these, anatomic and physiologic changes of pregnancy make the situation even more complicated.

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The incidence of acute abdomen during pregnancy is 1/500 to 1/635.¹ In USA, the incidence of non-obstetric surgery during pregnancy is 2% and the two most commonly performed surgical procedures during pregnancy are appendectomy and cholecystectomy.² Since there are no data to allow for specific recommendations, for optimal safety of the woman and the fetus, it is important for a clinician to obtain an obstetric consultation before performing a non-obstetric surgery.³ A team approach including anesthesia and obstetric care providers, surgeons, pediatricians and nurses is said to be mandatory.³

Herein, we report our clinical experience in surgical management of pregnant patients with non-obstetric acute abdomen. The article describes epidemiologic data, clinical outcomes and comparison of the imaging studies.

Material and Method

Pregnant patients with acute abdomen requiring surgical exploration were enrolled from January 2004 to December 2012. Women with acute abdomen who were followed-up or managed medically and who had a surgical procedure which was obstetric in nature, including ectopic pregnancy, pregnancy ending procedures such as dilation and curettage, hysterectomy and cesarean section were excluded from the analysis. Demographics, gestational age, symptoms, operative results, postoperative complications, pregnancy outcome and imaging studies were assessed. Decisions for surgery were either based on physical examination or imaging studies or both, were also evaluated. Radiological studies were reviewed and interpreted by radiology specialists and evaluated as either positive, negative or inconclusive. Informed consents were taken from all patients. SPSS 17.0 (Statistical Package for Social Sciences) was used for statistical analyses.

Results

After exclusion of pregnant women with acute abdomen who were followed-up or managed medically and who had a surgical procedure which was obstetric in nature, 24 pregnant patients with non-obstetric acute abdomen were enrolled to the analysis, and all underwent surgical exploration. Mean age was 28.25 ± 3.51 years (range 24-38). 6 patients (25%) were multigravid and 18 patients (75%) were primigravid. Mean gestational week was 20.96 ± 10.74 (range 7-38). 5 patients (29%) were in the first trimester, 11 (46%) in their second trimester and the last 6 (25%) in their third trimester. Data revealed that most operations took place in the second trimester. Most common symptoms were abdominal pain ($n=24$, 100%; most in right lower quadrant $n=15$, 62,5%) and subsequently nausea ($n=20$, 83%), vomiting ($n=12$, 50%), loss of appetite ($n=10$, 42%), vaginal bleeding ($n=5$, 21%) and subileus/ileus ($n=1$, 4%). Mean leukocyte count was 13245 ± 3668 (range 8100-22.300) and average body temperature was 37.10 ± 0.53 0C (range 36.5-38.2). Ultrasonography was performed in 22 patients (92%), MR imaging was used in 11 patients (46%). We did not use computerized tomography (CT) in our patients. Sonographic findings were diagnostic in 13 out of 22 patients (59%), while MR was successful in assigning the correct diagnosis in 100%. Ovarian torsion (in 8 patients) and appendicitis (in 6 patients) were the most common etiologies causing non-obstetric acute abdomen (33% and 25%, respectively). Besides these, 5 rupture of ovarian cyst (21%), 3 acute cholecystitis (13%), 1 isolated fallopian tube torsion (4%) and 1 small bowel obstruction (4%) were present. Of those 24 surgery, laparotomy was performed in 20 (83,3%), laparoscopy was performed in 4 (16,7%). There were no negative explorations. Of those 4 laparoscopies, 2 were performed for cholecystectomy, both in their second trimesters; the other 2 were

performed for unilateral salpingo-oophorectomy, one in her first trimester, the other in her second trimester. We performed laparotomy for 20 patients. Of those 20 patients, six had appendectomy, six had unilateral salpingo-oophorectomy, four had cystectomy, two had cholecystectomy, one had hysterectomy and one had salpingectomy. All patients tolerated surgery well, 11 of them (46%) had no postoperative complications, however 3 (13%) fetal losses, 4 (16%) preterm delivery, 3 (13%) PPROM, 1 (4%) re-operation (the one with small bowel obstruction) and 1 (4%) vaginal bleeding were observed. One patient (4%) in whom laparoscopic cholecystectomy was performed, died from acute respiratory distress syndrome in the 24th day of the surgery. The details are given in Table 1.

Discussion

Acute abdomen during pregnancy is still a great concern for both mother and the clinician. Dilemma is present between negative exploration and hesitation in taking a decision for surgery since both negative exploration and delayed diagnosis leaves the patient with increased risk of both fetal and maternal morbidity and mortality. In 2011, The American College of Obstetricians and Gynecologists recommended that 'a pregnant woman should never be denied indicated surgery, regardless of trimester and elective surgery should be postponed until after delivery' on the subject of non-obstetric surgery during pregnancy.³ Besides these, it is also indicated that no currently used anesthetic agents have been shown to have any teratogenic effects in humans when using standard concentrations at any gestational age and fetal heart monitoring may assist in maternal positioning and cardiorespiratory management and may influence a decision to deliver the fetus.³ Because of the uniqueness of pregnancy, it is also important for a clinician to obtain an obstetric consultation before performing non-obstetric surgery.³

In the present study, we suspected acute abdomen with clinical signs and symptoms, such as significant abdominal pain, fever and moderate to severe leukocytosis. Most of the patients were under the age of 30. However, the distribution of non-obstetric acute abdomen throughout the pregnancy was not significant. To be more prominent in the right lower quadrant (62,5%), most common symptom was abdominal pain.

In the medical literature, the incidence of acute abdomen is quite high during pregnancy and appendicitis is to be the most common cause. It accounts for the 25% of operative indications of non-obstetric surgery during pregnancy.⁴ Following radiological assessment, all of our 24 patients underwent surgical exploration and in contrast to medical literature, ovarian torsion was observed more common than appendicitis (33% and 25%, respectively). In our study, gynecological pathologies were more prevalent than those of gastrointestinal (58% versus 42%).

By the combination of physical examination and radiological studies, there were no delay in performing surgical exploration except in one case. This case was 25-year-old and at her 16th weeks of gestation, she was referred to our hospital with clinical and sonographic findings consistent with acute cholecystitis. There was a long time interval (approximately 2 weeks) between diagnosis and surgery and her postoperative follow-up ended up with both fetal and maternal death due to septicemia related acute respiratory distress syndrome and multi organ failure. This shows the importance of prompt diagnosis and treatment.

The growing trend of laparoscopic approach to surgical abdomen also affected our clinical practice. This technique has been used for the resolution of surgical abdomen during the first and second trimesters of pregnancy for years.¹ In our series, there were 4 laparoscopies out of 24 surgery with a ratio of 16,7%. However, the only observed maternal mortality was one of those laparoscopies. It should be noted that mortality was not procedure related, it was a consequence of delayed diagnosis. The other 3 did well postoperatively, without any complication. It appears to be well tolerated in pregnancy but to make better recommendations concerning its use, larger multicenter prospective studies are required.⁵

MR is an accurate diagnostic tool in detection of the cause of acute abdominal and pelvic pains during pregnancy and

should be considered after interminate findings of USG.⁶ It is also suggested that MR imaging is an excellent modality for diagnosis of acute appendicitis and exclusion of diseases requiring surgical or interventional treatment.⁷ In our study we did not use CT due to teratogenic and possible carcinogenic effect of ionizing radiation. In our study, sonographic findings were diagnostic in 59%, while MR was successful in assigning the correct diagnosis in 100%.

In conclusion, the issue of surgical management of non-obstetric acute abdomen during pregnancy is an important concern for clinicians who care women. Prompt diagnosis and appropriate surgical approach are the cornerstones of the management. Due to the diagnostic limitations of ultrasonography, MR imaging has become increasingly popular and gave direction to management strategy.

Gebelikte Obstetrik Nedenli Olmayan Akut Batının Cerrahi Yönetimi: 8 Yıllık Deneyim Sonrası 24 Olgunun Retrospektif Değerlendirmesi

AMAÇ: Gebelikte obstetrik nedenli olmayan akut batının tanı ve yönetimi hem obstetrisyenler hem de genel cerrahlar için endişe kaynağıdır. Gebelikte cerrahiye karşı gösterilen direnç, maternal ve fetal morbidite ve hatta mortaliteyi artırabilen ge-

Table 1: Clinical properties of the operated cases

Case number	Week of operation time	Diagnose	Surgical approach	Operation	Pregnancy outcome
1	16	Acute cholecystitis	Laparoscopy	Cholecystectomy	Delivery at term
2	8	Rupture of ovarian cyst	Laparotomy	Cystectomy	Abortion
3	7	Acute appendicitis	Laparotomy	Appendectomy	Delivery at term
4	22	Acute appendicitis	Laparotomy	Appendectomy	Delivery at term
5	26	Small bowel obstruction	Laparotomy	Bridectomy	Preterm birth
6	31	Acute appendicitis	Laparotomy	Appendectomy	Delivery at term
7	15	Ovarian torsion	Laparotomy	Unilateral salpingo-oophorectomy	Delivery at term
8	11	Ovarian torsion	Laparotomy	Unilateral salpingo-oophorectomy	Delivery at term
9	15	Ovarian torsion	Laparoscopy	Unilateral salpingo-oophorectomy	Delivery at term
10	10	Rupture of ovarian cyst	Laparotomy	Cystectomy	Preterm birth
11	8	Rupture of ovarian cyst	Laparotomy	Cystectomy	Abortion
12	18	Ovarian torsion	Laparotomy	Unilateral salpingo-oophorectomy	Preterm birth
13	32	Ovarian torsion	Laparotomy	Unilateral salpingo-oophorectomy	Delivery at term
14	22	Acute appendicitis	Laparotomy	Appendectomy	Preterm birth
15	35	Isolated fallopian tube torsion	Laparotomy	Salpingectomy	Preterm birth
16	36	Acute cholecystitis	Laparotomy	Cholecystectomy	Preterm birth
17	37	Acute appendicitis	Laparotomy	Appendectomy	Delivery at term
18	36	Rupture of ovarian cyst	Laparotomy	Cystectomy	Preterm birth
19	38	Rupture of ovarian cyst	Laparotomy	Cystectomy	Delivery at term
20	10	Ovarian torsion	Laparotomy	Unilateral salpingo-oophorectomy	Abortion
21	8	Ovarian torsion	Laparoscopy	Unilateral salpingo-oophorectomy	Abortion
22	16	Acute cholecystitis	Laparoscopy	Cholecystectomy	Maternal mortality
23	27	Acute appendicitis	Laparotomy	Appendectomy	Delivery at term
24	19	Ovarian torsion	Laparotomy	Unilateral salpingo-oophorectomy	Delivery at term

reksiz gecikmeye sebep olmaktadır. Bu çalışmada, gebelerde obstetrik nedenli olmayan akut batının cerrahi yönetimine ilişkin deneyimimizi paylaştık.

GEREÇ VE YÖNTEM: 2004-2012 yılları arasında akut batın bulguları olup cerrahi eksplorasyon ihtiyacı olan gebe hastalar çalışmaya dahil edildi. Cerrahi girişimi obstetrik nedenli olan hastalar değerlendirmeye alınmadı. Demografik özellikler, gebelik haftaları, belirtiler, ameliyat sonuçları, postoperatif komplikasyonlar, gebelik sonuçları ve görüntüleme çalışmaları değerlendirildi.

BULGULAR: Çalışmada 24 hasta olup, yaş ortalaması 28.25 ± 3.51 idi. Ameliyatlar sıklıkla ikinci trimesterde gerçekleştirilmişti. En sık semptom karın ağrısı (%100) ve bulantıydı (%83). Over torsiyonu ve apendisit obstetrik nedenli olmayan akut batının en sık etyolojik nedenleriydi (sırasıyla %33 ve %25). Tüm hastalar ameliyatı iyi tolere etti, 11'inde postoperatif komplikasyon gelişmezken, 3 fetal kayıp, 4 preterm doğum, 3 PPRM, 1 re-operasyon ve 1 vajinal kanama görüldü. Bir hasta ameliyatın 24. gününde akut respiratuvar distres sendromu nedeniyle kaybedildi. Hastaların 22'sine ultrasonografi uygulanırken, 11'inde MR görüntüleme faydalanıldı. Sonografi bulguları olguların %59'unda tanısal iken, MR doğru tanı koymada %100 başarılıydı.

SONUÇ: Gebelikte obstetrik nedenli olmayan akut batının cerrahi yönetimi konusu kadınlarla ilgilenen hekimler için önemli bir husustur. Hızlı tanı ve uygun cerrahi yaklaşım yönetimin köşe taşlarını oluşturur. Ultrasonografinin tanısal sınırlılıkları nedeniyle, MR görüntüleme giderek daha popüler ve yönetim stratejisine yön verir hale gelmiştir.

Anahtar Kelimeler: Akut batın, Gebelik, Obstetrik nedenli olmayan cerrahi, Ultrasonografi, MR görüntüleme

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