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Early laparoscopic cholecystectomy of acute cholecystitis in pregnancy and early postpartum period

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Abstract

Background

gallstone prevalence is twice as high in women as in men at all ages in every population studied. during pregnancy and postpartum, and 1-3% of pregnant women undergo cholecystectomy due to clinical symptoms or complications within the first year postpartum. laparoscopic cholecystectomy is relatively well tolerated, safe and preferred during pregnancy or postpartum.

Patients and method

40 pregnant and postpartum patients with acute cholecystitis underwent laparoscopic cholecystectomy at alazhar faculty of medicine asuite branch.

Result

40 women were enrolled in this study during their first or second trimester of pregnancy and postpartum period. Patients were experiencing right hypochondrium pain in 92.5% of cases, fever in 45% of cases, and jaundice in 7.5% of cases. There was a palpable mass in the right hypochondrium in 10% of cases.

Conclusion

laparoscopic cholecystectomy is safe during pregnancy and in all trimesters. Laparoscopic cholecystectomy during pregnancy and postpartum has advantages for the mother which lead to rapid recovery with less complications.

Introduction

Gallbladder disease has a higher incidence in women than in men and is particularly high in multiparous women. Pregnancy is considered to be one of the major risk factors for cholesterol cholelithiasis. The incidence of gallstone disease ranges from 3.3 to 12% in pregnant women. 1

The most common non-obstetrical surgical emergencies complicating pregnancy are acute appendicitis and cholecystitis 2,3

It has been shown that the prevalence of gallstones in women who had two to three or more pregnancies ware 2- to 3-fold higher compared with nulliparous women.4

Pregnancy and the postpartum period are physiological conditions that favor the development of gallbladder lithiasis due to an increase in serum cholesterol and triglycerides, an increase in their elimination through the bile and increase of biliary pigments owing to continuous hemolysis and to weight gain itself during gestation, as well as rapid loss during the puerperium or postpartum period 5

Estrogen plays an important role in lithogenesis, mainly by increasing cholesterol synthesis. The cholesterol secretion rate is proportional to the secretion of biliary acids and phospholipids, and as a result, the bile becomes saturated and causes de formation of calculi. An increase in estrogen receptors caused by pregnancy has been also described, specifically alpha-type estrogen receptors present in the liver and gallbladder6

the late stage of pregnancy, plasma concentrations of estradiol and estrone are approximately 100-fold higher than the respective average values in the menstrual cycle. These alterations greatly enhance susceptibility to cholesterol gallstones in pregnant women in addition, increased progesterone concentrations impair gallbladder motility function .4,7

Not only but also pregnancy creates a state of gallbladder dyskinesia caused by relaxation of the gastrointestinal tract hollow viscera soft muscle by progesterone, which also increases sphincter of Oddi's tone6,8

In women with pre-existent gallstones pregnancy may bring out symptoms, including pain and even acute cholecystitis. In the postpartum period after gallbladder motility is restored, sludge and stones may pass from the gallbladder causing biliary colic or other complications. Alternatively, postpartum changes in bile composition may favor regression of sludge or stones. 1

Gallstones are the most common causes of surgery in pregnant women after acute appendicitis. Maternal and infant morbidity and mortality increase due to these non-obstetric diseases.9

More than half of the patients with gallbladder-related symptoms who did not undergo cholecystectomy in the antepartum period become symptomatic in the early postpartum period. 10

recurrent biliary colic occurs more frequently in patients with gall bladder stones who were followed conservatively than those who were not pregnant. In these patients, ERCP due to choledocholithiasis may cause more serious morbidity (10,11).

The aim of this study is to demonstrate the efficacy of laparoscopic cholecystectomy performed during pregnancy and early postpartum period in patients with acute cholecystitis during pregnancy and early postpartum period in order to prevent complications related to gallstones in the early postpartum period.

Patients and methods

This study was conducted at the general surgery department, faculty of medicine of Al-Azhar University (Assuit branch).

A total of 40 patients pregnant and postpartum patients were included in the study. All patients suffering acute cholecystitis were diagnosed in the outpatient clinic or at the emergency department or referred from the department of obstetrics and gynecology. The duration of the study From December 2022 to January 2024 were included in the study.

Full obstetric history includes, gestational age, number of pregnancies, maternal and fetal complications, symptoms, physical examination, laboratory and radiological findings, diagnosis, treatment, number of hospital admissions, and hospital length of stay of these patients.

General surgical examination of patients suffering upper abdominal pain with manifestation of acute cholecystitis with or without complications i.e., vomiting, signs of peritoneal irritation and tachycardia, with or without low-grade fever or fever during pregnancy and puerperium or early postpartum for one-year post-partum.

the diagnosis required ultrasound confirmation, with acute episodes being differentiated by the presence of gallbladder wall thickening in addition to the presence of stones: distension of the gallbladder lumen, gallbladder, a positive US Murphy sign, pericholecystic fluid and a hyperemic wall upon evaluation with Color Doppler.

Investigations which include blood test, renal function tests, X-ray chest, ECG, Serum bilirubin, Serum alkaline phosphatase, ALT, and AST. When US were not able to diagnose any associated pathology magnetic resonance cholangiopancreatography (MRCP) was done to rule out malignancy contrast

enhanced CT was done in selected cases. Women presenting with acute cholecystitis during pregnancy or immediately postpartum were included in this study. Patients with obstructive jaundice, malignancy, cholangitis, pancreatitis, generalized peritonitis and patients who failed conservative therapy are excluded from the study.

Surgical technique

The operations were done under general anesthesia using endotracheal intubation. Intraoperative CO2 monitoring by capnography used during operation. The patients positioned in the left lateral decubitus position or partial left lateral decubitus position to minimize compression of the vena cava. The abdominal cavity is entered through infraumblical incision using open hasson technique or direct trocar insertion using visual port. Pneumoperitoneum was adjusted between 8-12 mmHg with slow insufflation technique. Another 3 ports were used: one 10-mm ports subxyphoid which is the working port and two 5-mm ports (one at the midclavicular line one inch below the costal margin and the other port in the right flank). The operation was done with the patient in an inverse Trendelenburg position. Avoidance of any manipulations of the uterus. Adhesion was dissected and exposure of Calot's triangle was first done. If the gallbladder is distended, it was emptied through aspiration needle. Dissection was done to isolate the cystic duct and the artery. Cystic duct and artery clipped and divided. The gallbladder was removed from its bed using hook and spatula. The gallbladder extracted through the epigastric incision, which was enlarged according to the need. A tube drain was placed and the incisions were closed.

Morbidity was monitored according to the specific type of medical or surgical complication, and if there was abortion, perinatal or maternal death as a consequence operation. Cardiotocography used for fetal monitoring.

duration of hospitalization was defined as time from the admission until the discharge of the patient following surgery.

Committee approval

Ethical approval for this study was provided by the Ethical Committee of faculty of medicine alazhar university asuite branch. The approval number is 263. Written informed consent was obtained.

Results

40 women were enrolled in this study during their first or second trimester of pregnancy and postpartum period. demographic data of these patient demonstrated in table 1.

Table: 1 demographic data of patients

	Range	Mean
age	20-42	31
Parity	2-5	3
Body mass index	22-38	27

Patients were experiencing right hypochondrium pain in 92.5% of cases, fever in 45% of cases, and jaundice in 7.5% of cases. There was a palpable mass in the right hypochondrium in 10% of cases.

Table: 2 patient presentation

Patient presentation	Number	Incidence
1st trimester	8	20%
2nd trimester	14	35%
3rd trimester	7	17.5%
Postpartum	11	27.5%
Pain	37	93%

Jaundice	3	7.5%
Vomiting	13	32.5%
CBD stone	1	2.5%
Gall bladder stones	38	95%
Sludge	2	5%
fever	18	45%
Palpable mass	4	10%

Table: 3 complications related to cholecystectomy and pregnancy related

complications	Number	Incidence
Conversion to open	2	5%
Major bile leak	1	2.5%
Minor bile duct leak	1	2.5%
Wound infection	2	5%
Ileus	1	2.5%
Vaginal bleeding	3	7.5%
Abortion	1	2.5%
Vomiting	15	37.5%
ERCP	2	5%

discussion

the management of acute cholecystitis in pregnancy is still controversial. Traditionally, the management of acute cholecystitis during pregnancy has often been nonsurgical to avoid fetal and maternal harm However, nonoperative treatment

of acute cholecystitis in pregnancy results high incidence of recurrence rates, multiple hospital admissions in antepartum or postpartum period and increased risk of preterm labor, spontaneous abortions and maternal morbidity and mortality. Symptom recurrence.[12]

Guidelines applied for optimal management Cholecystitis and gall stones in the pregnant woman. A rating system to provide therapeutic guidance based on potential benefits and fetal risks.

all patients had a gynecological examination with obstetric ultrasound, which examinations were normal in all cases.

Symptoms of acute cholecystitis during pregnancy are almost the same as the general population [13]. Presentation usually starts with abdominal pain localized commonly in the right upper abdomen, or in the epigastrium. biliary colic may radiate to the right shoulder. One in two patients may have nausea and vomiting. Moreover, 70%−80% of patients may report a history of vesicular lithiasis and/or liver colic attacks [14].

Findings on physical examination vary according to the severity of cholecystitis. Fever is above 38°C in 30% of cases [15]. Murphy's sign that is rarely observed in pregnant women, or fever, and tachycardia [16].

In our study abdominal pain is present in almost all cases however, vomiting is present in about one third of cases while jaundice in only 7.5% of cases and fever in about 45% of cases.

Ultrasound is the most appropriate procedure in pregnancy as it's noninvasive, fast, save and can diagnose 95%–98% of cholecystitis. The ultrasonographic findings of acute cholecystitis is the wall thickening (>3 mm), pericholecystic fluid, and the sonographic Murphy's sign. [12] In this study, ultrasound was done in all cases as investigation for prove of cholecystitis.

Magnetic resonance cholangiopancreatography can be done in suspected complication if gallstones recent reports, safety of MRCP in pregnancy was approved. [17,18] common bile duct stones during pregnancy may be treated by ERCP with biliary sphincterotomy, biliary stone extraction, or stent placement. However, ERCP infrequently could be complicated with post-ERCP pancreatitis, hemorrhage, or perforation. it is being safely applied in recent years.[19] In this study, MRCP were performed in two patients for detection of choledocholithiasis. ERCP was done in one patient in which sphincterotomy, stone extraction, and stent insertion was done by ERCP without maternal and fetal complications.

nonoperative treatment of complicated gallbladder diseases in pregnancy results high symptom recurrence rates and multiple hospital admissions in antepartum or postpartum period.[20]

According to Society of American Gastrointestinal Endoscopic Surgeons guidelines, laparoscopic cholecystectomy can be safely performed in pregnant patients during any trimester.[21]

the surgical decision was done after consensus between the surgeon, obstetrician and the patient, with an intention to perform laparoscopic cholecystectomy

Lu, et al [22] have studied78 pregnancies admitted with biliary tract disease. 10 underwent surgery while pregnant. There were no deaths, preterm deliveries, or intensive care unit admission.

The present study shows no deaths or major complication or preterm delivery with one abortion with minor related biliary complications.

because of high fetal and maternal complication rates, the management of acute cholecystitis in pregnancy is a difficult subject. Laparoscopic cholecystectomy can be safely performed in pregnancy with lower fetal and maternal complications rates.

Conclusion

laparoscopic cholecystectomy is safe during pregnancy and in all trimesters. Laparoscopic cholecystectomy during pregnancy and postpartum has advantages for the mother in that it hastens the recovery, lead to less pain, and decreases the incidence of complications from large incisions. If a laparotomy incision can be avoided, pain and analgesic intake should be less, and the recovery time is greatly reduced.

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