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Original article

Laparoscopic cholecystectomy during pregnancy: A case series

Mamta Dagar*, Mala Srivastava, Indrani Ganguli, Ashish Dey

Sir Ganga Ram Hospital, New Delhi, India

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ABSTRACT

Objective: To study safety, feasibility and short term outcomes of laparoscopic cholecystectomy during pregnancy.
Methods: Between January 2013 to December 2016, all patients undergoing laparoscopic cholecystectomy during pregnancy at our hospital were retrospectively identified. Eight patients underwent laparoscopic cholecystectomy for symptomatic biliary disease during first and second trimester of pregnancy. Laparoscopic cholecystectomy was performed under general anesthesia.
Results: During the study period of 4 years from January 2013 to December 2016, 8 patients with gestational ages ranging from 11 to 28 weeks underwent laparoscopic cholecystectomy during pregnancy. Of them 2 patients were in the first trimester and 6 patients in the second trimester. The indication for surgical intervention was unrelenting biliary colic unresponsive to medical management and cholecystitis in 7 patients and gangrenous gall bladder in one patient. The latter patient had undergone successful Endoscopic Retrograde Cholangio Pancreatography (ERCP) followed by laparoscopic cholecystectomy after 5 days. There were no conversions to open. All patients had an uneventful post-operative recovery. There were no miscarriage or premature births in this group. There was one fetal demise 5 weeks following surgery due to severe oligoamnios, incidence of which is unrelated to laparoscopy.
Conclusion: Laparoscopic cholecystectomy during pregnancy is safe for both the mother and the unborn fetus. Surgery is indicated in unrelenting biliary colic or complications of cholelithiasis. Extreme caution during access to the abdominal cavity and keeping pneumoperitoneum pressures and operating times to a minimum should be kept in mind at all times.

1. Introduction

Biliary tract disease is a common acute surgical condition encountered during pregnancy second only to acute appendicitis.[1,2] Among various reasons suggested, changes in hormone levels, especially higher levels of progesterone seem to be the main etiological factor.[3] Asymptomatic gallstones are common in pregnancy and have been known to resolve following delivery. Therefore many authors suggest a conservative approach in this group of patients.[4] It is difficult to arrive at a general consensus regarding the optimum line of management but it is generally agreed that cholecystectomy should be performed only if conservative management fails. Failure of nonsurgical management would generally mean unrelenting pain unresponsive to medications or progression to acute cholecystitis, mucocoele, empyema or gangrene of the gall bladder. Traditionally, laparoscopic interventions for gallstones were recommended only in the second trimester because of anticipated poor maternal and fetal outcomes in the first and third trimester. Second trimester was considered safer because of low risk of miscarriage, the fact that organogenesis is complete by this time and also that the uterus is usually small enough not to interfere with the laparoscopic approach. However recent SAGES guidelines suggests that laparoscopy can safely be performed in any trimester of pregnancy.[5]

Symptoms of biliary tract disease may be difficult to interpret during pregnancy. A number of factors including pressure effect of the enlarged uterus on the neighbouring organs displacing them and the increased distance of the abdominal wall from the underlying inflamed organ are some reasons why precise diagnosis of the cause of pain may be difficult to establish. Symptoms may also be nonspecific and common to both the conditions including nausea, vomiting and epigastric discomfort. Various reasons suggested for increased incidence of symptomatic gallstones are increased cholesterol secretion, decreased bile acid pool size,

* Corresponding author at: Sir Ganga Ram Hospital Marg, Rajinder Nagar, New Delhi, 110060, India.
E-mail address: drmamtadagar@gmail.com (M. Dagar).

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decreased enterohepatic circulation, decreased percentage of chenodeoxycholic acid and increased bile stasis.[6]

Pregnancy was initially considered an absolute contraindication for laparoscopic cholecystectomy as a treatment modality for symptomatic gallstones. The initial reluctance for laparoscopic cholecystectomy in the pregnant patient was because of its concerns for fetal wastage, effects of carbon dioxide on the developing fetus and its long-term neurological sequelae.[7] Initial concerns of maternal and fetal acidosis leading to fetal losses and fetal anomalies were however found to be exaggerated. Also the incidence of preterm labour during laparoscopic surgery documented in animal studies was found to be negligible in published studies. In fact laparoscopic surgery is actually associated with a lower incidence of premature delivery because of decreased uterine manipulation.[8,9] Many studies have actually demonstrated suboptimal clinical outcomes and repeated hospital admissions following conservative medical treatment in this group of patients. They have suggested that laparoscopic cholecystectomy can be safely performed during pregnancy.

There have also been concerns regarding laparoscopy in late pregnancy. The enlarged uterus and relatively smaller abdominal cavity in advanced gestation theoretically increases the risk of penetration of the uterus by the veress needle or subsequent trocar insertion. The use of open Hassan's technique has been suggested to reduce the dangers of inadvertent injury to the gravid uterus.[10] However recent SAGES guidelines suggests that in experienced hands it is equally safe to create access for pneumoperitoneum by either closed or open techniques in these patients.[5] An additional concern is that high intraabdominal pressure and decreased venous return and cardiac output might result in reduction of utero-placental blood perfusion. Also the trendelenburg position may aggravate the low lung compliance in these patients. Advances in perioperative management, anesthetic agents and laparoscopic surgery have made cholecystectomy to be a safe and feasible option during pregnancy well supported by the literature.[11–13]

This study aims to collect retrospective data and follow up these patients who had undergone laparoscopic cholecystectomy in first and second trimester of pregnancy in our hospital during a specified time period.

2. Methods

We retrospectively included all pregnant patients at our hospital undergoing laparoscopic cholecystectomy between January 2013 and December 2016 in our unit. There were eight cases of laparoscopic cholecystectomy performed during first and second trimesters of pregnancy. An informed consent for laparoscopic intervention explaining in detail the risks and possible documented complications had been obtained preoperatively from all the patients.

Laparoscopic cholecystectomy was carried out by surgeons with broad experience in operative laparoscopy. All surgeries were carried out under general anesthesia with the patient in reverse trendelenburg position and the operating table tilted to the left. Access to the abdominal cavity and insufflation was carried out using the Veress Needle in 7 and open Hasson technique in one of the cases. An average intra-abdominal pressure of 12 mm of Hg was used throughout the procedure. Capnography for measuring end tidal CO_2 was used in all the patients. Invasive maternal CO_2 monitoring or fetal cardiac monitoring was not routinely performed. However fetal heart rate was evaluated by ultrasound before and immediately after surgery. Preoperative tocolytics were not administered to any of the patients. Although they were kept available in case premature contractions occurred after the operation, we did not have to use them.

Table 1
Details of pregnant women who underwent laparoscopic cholecystectomy.

S. No	Gravida, Parity (G,P)	Age	Gestational Age at LC (Weeks)	Gestational Age at Delivery	Indication of LC	Pre Op ERCP/ MRCP	Mode of Delivery	Fetal Outcome and weight (gms)	Hospital Stay post LC (Hours)	Previous Abdominal Incision	Entry technique Veress/ Hasson (V/H)	Intra Op CO_2 Pressure (mm/Hg)	Operative Time (Min)	Histopathology	Readmission After LC
1.	G2A1	25	28^{+1}	40	Rec. BC	ERCP	LSCS	AGA/LB 2500 gm	72	No	V	12	60	Acute gangrenous cholecystitis	No
2.	G1	30	27^{+4}	38^{+2}	cholecystitis	–	LSCS	AGA/LB 3200 gm	48	No	V	12	115	Chronic cholecystitis	No
3.	G4P2L1A1	32	23^{+6}	37^{+6}	cholecystitis	–	NVD	AGA/LB 2460 gm	72	Yes	V	12	58	Chronic cholecystitis	No
4.	G1	25	17^{+1}	38	cholecystitis	–	NVD	AGA/LB 3000 gm	72	No	V	12	60	Chronic cholecystitis	No
5.	G2P1L1	24	14^{+2}	37^{+5}	cholecystitis	–	NVD	AGA/LB 2260 gm	72	No	V	12	100	Chronic cholecystitis	No
6.	G1	28	12^{+1}	40	Rec. BC	MRCP	NVD	AGA/LB 2700 gm	72	No	V	12	50	Chronic cholecystitis	Yes
7.	G2P1L1	37	11	40	Rec. BC	–	LSCS	AGA/LB 3000 gm	72	No	V	12	60	Chronic cholecystitis	No
8.	G1	28	23	28	cholecystitis	–	PT NVD	SGA/SB 600 gm	48	No	H	12	60	Chronic cholecystitis	No

Rec B.C – Recurrent Biliary Colic, LC – laparoscopic cholecystectomy LB – Live Birth, SB- Still Birth, AGA – Appropriate for gestational age, SGA – small for gestational ag, MRCP – Magnetic resonance cholangiopancreatography, ERCP – Endoscopic retrograde cholangio-pancreatography.

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