

Diagnostic and Therapeutic Endoscopy in Pregnancy: When, Why and How?

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Abstract

Gastrointestinal endoscopy is conquering various milestones not only in diagnostics but also in therapeutic endoscopy. However, limited studies are available about its safety and efficacy in pregnant patients. Hospital admission, pre-procedure risk assessment by obstetrician, perinatologist, anaesthetist and gastroenterologist is important. Endoscopy should be performed with strong indications only. ERCP should be performed with therapeutic intent by expert endoscopist. This review will address basic clinical questions when performing endoscopy in pregnancy.

Keywords: Endoscopic retrograde cholangiopancreatography; Pregnancy; Upper gastrointestinal endoscopy; Sigmoidoscopy

Introduction

Though gastrointestinal endoscopy is conquering various milestones in both diagnostic and therapeutic endoscopy; there is limited data available on safety and efficacy of endoscopy in pregnancy. All invasive procedures including GI endoscopy carries risk to fetus due to maternal hypoxia and hypotension during procedure can lead to fetal hypoxia [1,2]. Informed consent should include risk to fetus and mother as well [3].

Elective procedure can be postponed till third trimester or postpartum period. However, in case of emergency therapeutic endoscopy can be performed safely by experts with relatively lower risk than that of radiological or surgical procedures [4-6].

The American Society for gastrointestinal endoscopy published guidelines for endoscopy in pregnancy [3].

The aim of this review to highlight the key questions such as what are indications and which precautions should be taken (Table 1).

| S No. | Principles |
|-------|---|
| 1 | Pre-procedure obstetrician's consultation. |
| 2 | Always have a strong indication. |
| 3 | Defer to second trimester if possible. |
| 4 | Use lowest effective sedation and minimize procedure time. |
| 5 | Position patient in left lateral position during peri-procedure period. |
| 6 | Fetal monitoring whenever required. |
| 7 | Endoscopy is contraindicated in placental abruption, uncontrolled eclampsia, imminent delivery or ruptured membranes. |

Table 1: ASGE's general principles for endoscopy in pregnancy.

Which drugs can be used for Anesthesia?

Pregnancy related physiological changes; itself imposes great clinical challenge for anesthesia [7]. Majority of drugs used during endoscopy are US FDA category B with few category C drugs [3].

Table 2 listed drugs used during endoscopy and its clinical relevance during pregnancy and possible adverse effects (Table 2).

| Drug | US Category | FDA | Comments |
|------------|--------------------|-----|--|
| Meperidine | B in regular use | | Repeated administration can cause maternal respiratory depression and seizure. |
| | D in prolonged use | | |
| Fentanyl | C | | Shorter recovery period than meperidine. |
| Propofol | B | | Shorter recovery period, narrow therapeutic index. |
| Ketamine | B | | Rapid onset, short duration, used when insufficient sedation with propofol. |
| Naloxone | B | | To reverse narcotic overdose, used to treat respiratory depression, hypotension. |
| Flumazenil | C | | To reverse benzodiazepines overdose. |

Table 2: Drugs used during endoscopy and their relevance in pregnancy.

What are pre-procedure precautions?

Endoscopy should be deferred to the second trimester unless strongly indicated [8]. Pre-procedure consultation of obstetrician in every cases and fetal monitoring if necessary according to available resources [3].

To prevent compression of aorta or IVC by gravid uterus resulting into maternal hypotension; all endoscopies should be performed in left lateral position [7]. This should be followed during pre and post procedure period also.

Upper GI endoscopy

The most common indication for upper GI endoscopy (UGIE) in pregnant woman are bleeding, abdominal pain and refractory vomiting [3]. The most common UGIE finding was reflux esophagitis followed by Mallory Weiss tear and peptic ulcers [9]. UGIE is safe for fetus when it is strongly indicated [10,11]. In a multicenter case control study of 83 pregnant patients [12]. GI bleed followed by abdominal pain and vomiting were most common indication. However, diagnostic yield for GI bleed was 95%; it ranged from 50 to 80% for other indication. In the same study, UGLE did not induce labor or result in congenital malformations. In another study, UGIE was helpful for clinical management when performed for suspected gastrointestinal bleeding (82%) rather than for other indications (69%) [13]. So, it can be concluded that UGIE is more useful in GI bleeding than any other indication. Though nausea and vomiting are extremely common during pregnancy; UGIE for refractory vomiting or hyperemesis gravidarum usually don't alter clinical management [12,13].

Out of various endoscopic hemostatic techniques available for non-variceal upper GI bleed (NVUGB); there is insufficient data to recommend specific endotherapy in pregnancy [6,12]. Epinephrine injection is commonly done to control active GI bleed in the general population; but it may cause decreased uterine blood flow being categorized as category C drug [9,11]. Amniotic fluid can conduct electric current during electrocoagulation. A bipolar electrocautery should be preferred along with a grounding pad placed such that the uterus is not between electric cord and the grounding pad [3].

Due to decreased fertility in liver cirrhosis variceal hemorrhage is rare, though it can occur in non-cirrhotic portal hypertension [14]. Being a hypervolemic state, pregnancy is associated with increased portal blood flow that can increase portal pressure resulting into increased risk of variceal haemorrhage [15]. The improved maternal and fetal outcomes can be achieved with successful control of variceal haemorrhage [16].

Safety of beta blockers in pregnancy has not well studied for prevention of variceal bleed. Beta blockers are generally considered safe in pregnancy however propranolol and nadolol both carry category C risk and have risk of causing fetal bradycardia, growth retardation and neonatal hypoglycaemia [14,17].

Sigmoidoscopy/colonoscopy

The most common indication for sigmoidoscopy in pregnancy is significant lower GI bleeding, refractory chronic diarrhoea, suspected IBD flare, and colonic malignancy [9]. Sigmoidoscopy when indicated is safe in pregnancy, however there is limited data on colonoscopy [11]. For preparation for sigmoidoscopy tap water enema is sufficient; however for colonoscopy polyethylene glycol preparation is required which is studied in limited studies [18]. ASGE recommends caution for use of sodium phosphate for colonoscopic preparation [3].

Sigmoidoscopy is significantly more diagnostic for hematochezia than for other indications ($p < 0.03$). It is not associated with endoscopic complications or fetal demise compared to controls in the pregnant patients [19]. Due to insufficient data on safety and efficacy of colonoscopy during pregnancy, it is indicated only in cases with strong indication [11]. Therapeutic colonoscopy for haemostasis can be done with modalities mentioned in UGI endoscopy section. Non-bleeding polypectomies should be deferred till post-partum period,

though advanced adenomatous polyps can be removed in index colonoscopy [3].

Endoscopic retrograde cholangiopancreatography

The most common indication for ERCP during pregnancy is choledocholithiasis complicated by jaundice, cholangitis or pancreatitis [3]. Female in reproductive age should undergo urine or blood pregnancy test to avoid radiation exposure to fetus if ERCP is performed. ERCP can be performed with safety by expert endoscopist [20,21]. However, there is slightly increased rate of post ERCP pancreatitis (16%) in one study [20]. Radiation exposure during ERCP to the fetus may increase risk of fetal complication. Appropriate lead apron can be used to decrease radiation exposure [11]. To eliminate radiation, ERCP can be performed with fluoroscopy in which aspiration of bile is used to confirm CBD cannulation [22]. After achieving deep CBD cannulation, complete biliary sphincterotomy can be performed followed by CDB stent placement [23]. Definitive ERCP can be performed after delivery [22,23]. Though ERCP can be performed with safety during pregnancy, it should be avoided when there is weak indication or for diagnostic purpose [3].

There is limited data on endoscopic ultrasound, spy Cholangioscopy etc., during pregnancy.

Summary

Endoscopy should be performed in pregnancy when there is strong indication. Pre-procedure obstetrician's consultation is necessary with maternal and fetal monitoring during peri-procedure period whenever required. Patient's preparation, informed consent, positioning of patient not only during procedure but also pre and post procedure is of paramount importance. Further clinical studies with improvement in technology can further improve outcomes of endoscopy in pregnancy.

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