



# Obstetrics and Gynaecology Cases - Reviews

## CASE REPORT

# Laparoscopic Management of Interstitial Ectopic Pregnancy with Endo GIA™ without Rupture

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## Abstract

Interstitial pregnancy is uncommon, accounting for 2-4% of all ectopic pregnancies. It is potentially serious and mortality is most commonly due to rupture and subsequent hemorrhage. Both medical and surgical management options are available, depending on a given individual's case. Currently, the preferred surgical approach is laparoscopy. However, despite the presence of different laparoscopic techniques, there is no consensus on a single best technique. We report a case of a 27-year-old pregnant female who presented with brownish vaginal discharge and mild lower abdominal pain. She was diagnosed with left-sided interstitial ectopic pregnancy and managed laparoscopically with the aid of Endo GIA™ without rupture or bleeding. Endo GIA™ (Covidien, Medtronic) is a disposable, reloadable, automatic stapler that excises tissue between 2 lines of staples while maintaining hemostasis at the same time. This case demonstrates the feasibility of managing interstitial pregnancy laparoscopically using automatic staplers with good outcome and minimal complications.

## Case Presentation

A 27-year-old pregnant female (Gravida 2 Para 1) with a 3-week history of amenorrhea, presented to the emergency department in our institution with a history of brownish vaginal discharge for 4 days, associated with mild lower abdominal pain. Her past medical and obstetrical history is significant for a cesarean section she underwent following her first pregnancy 2 years back due to nuchal cord with no intraoperative or postoperative complications. On examination, the patient was vitally stable and afebrile. Her abdomen was soft on palpation and non-tender. There was no cervical excitation.

## Investigations

**Laboratory:** Laboratory investigations on admission (Table 1).

**Imaging:** Initial bedside ultrasound was done and showed an interstitial pregnancy with a crown rump length (CRL) of 4 mm in the presence of fetal heart. Minimal free fluid in the pelvis was demonstrated as well (Figure 1).

**Differential diagnosis:** Based on imaging and correlation with  $\beta$ -hCG levels, the diagnosis of left-sided interstitial ectopic pregnancy was established.

**Management:** Laparoscopic excision of the ectopic pregnancy was performed. Routine laparoscopy was done with 4 ports: Umbilical (10 mm), suprapubic (12 mm), right iliac fossa (15 mm), and left iliac fossa (15 mm). Exploration revealed a uterus of normal morphology and size with a scar of the previous cesarean section on the vesicouterine fold. Right ovary appeared normal and right fallopian tube looked grossly normal and thin with healthy fimbria. Left ovary appeared normal and left interstitial ectopic mass was seen (measuring approximately 2 × 3 cm) and resected with the aid of Endo

Table 1: Laboratory investigations on admission.

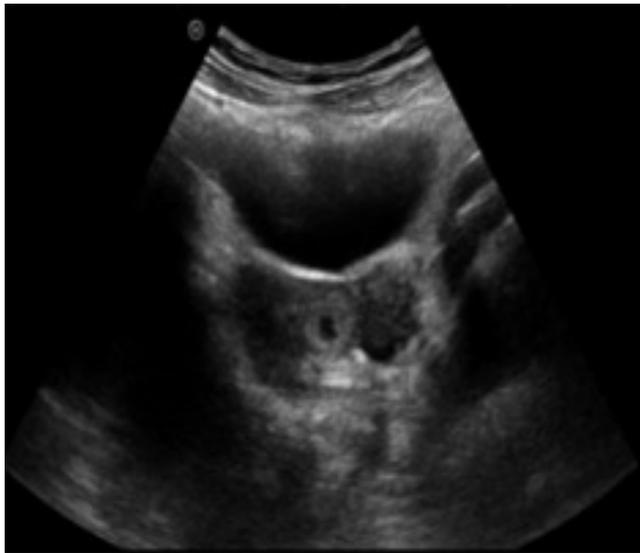
Parameter	Result	Reference range
Hemoglobin	117	123-157 g/L
Biochemistry panel	Within normal limits	
Beta-Human Chorionic Gonadotropin ( $\beta$ -hCG)	6111	5-50 mIU/mL (at the gestational age of the patient)



**Citation:** AlHarmi R, Hassan R, Darwish B, Dayoub N (2018) Laparoscopic Management of Interstitial Ectopic Pregnancy with Endo GIA™ without Rupture. *Obstet Gynecol Cases Rev* 5:114. doi.org/10.23937/2377-9004/1410114

**Received:** December 09, 2017; **Accepted:** January 31, 2018; **Published:** February 02, 2018

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**Figure 1:** Ultrasound images showing left interstitial pregnancy, measuring around 15 × 16 mm.



**Figure 2:** Cornuectomy performed by utilizing Endo GIA™ 35-mm stapler.



**Figure 3:** Cornuectomy done with minimal bleeding and without rupture.

GIA™ 35-mm stapler (2 loads) without being ruptured. Left salpingectomy was done as well. Operative specimen was extracted in an Endobag™ specimen retriev-

al pouch and samples were sent for histopathological examination. Minimal amount of fluid was visualized in the Pouch of Douglas. Hemostasis was secured and the procedure was accomplished with minimal bleeding (estimated overall blood loss = 50 ml). The abdominal cavity was explored and structures appeared grossly normal. Irrigation of the abdominal cavity was conducted and the rectus sheath was closed with umbilical and suprapubic incisions. The skin was closed with Vicryl® 3-0 suture. Operative time was around 1 hour (Figure 2 and Figure 3).

## Histopathology Report

### Microscopic examination

Left fallopian tube containing chorionic villi and hemorrhage in the lumen confirming tubal ectopic pregnancy.

### Macroscopic examination

Segment of fallopian tube measuring 5.5 × 1.5 × 0.5 cm. The base of the fallopian tube is firm and congested measuring 2.7 × 1.7 × 1 cm. The cut surface shows lumen filled with hemorrhage.

Postoperatively, routine laparoscopic surgery protocol was followed with an uneventful hospital course. The patient was discharged from the hospital on 2<sup>nd</sup> postoperative day.

### Outcome and Follow-up

The patient was followed for 3 months following the surgery and has been in a satisfactory condition. Normal menstrual cycles resumed following surgery. Serial β-hCG levels were monitored till full resolution. Risks of getting pregnant were explained and she was advised to postpone any plan for conception for a period of 12 months due to the presence of a previous cesarean section scar and a fresh uterine scar on the left cornu. Additionally, if any future conception takes place, delivery will be conducted through a cesarean section at 37 weeks of gestation.

## Discussion

Ectopic pregnancy occurs in 1-2% of all pregnancies, most commonly occurring in the fallopian tube. It could be a life-threatening event [1]. The proximal portion of the fallopian tube that lies within the myometrium is termed the interstitial part. A pregnancy occurring in this part is known as an interstitial ectopic pregnancy [2]. While some authors use the terms 'interstitial' and 'cornual' synonymously, others have defined a cornual pregnancy as one occurring in a congenitally abnormal uterus; in one horn of a bicornuate uterus [3].

Interstitial pregnancy is uncommon, accounting for 2-4% of all ectopic pregnancies. It is potentially serious with a mortality rate of 2-2.5%, especially in undiagnosed cases. This rate is sevenfold higher than that of other types of ectopic pregnancy. Mortality is most

Table 2: Laparoscopic management of interstitial or cornual ectopic pregnancy with stapler (Endo GIA™, Echelon Flex™ Endopath®) in published cases.

References	Cases (n)	Parity	Gestational age (weeks)	Pre-operative $\beta$ -hCG (mIU/mL)	Size (mm)	Side	Cardiac activity	Rupture	Hemo-peritoneum	Surgical technique	EBL (mL)	Note	Follow-up
Sergent, et al. [9]	3	NA	6	20,114	30 x 50	NA	NA	✓	✓	Salpingectomy Cornual resection	NA	Average operative time: 30 minutes	$\beta$ -hCG levels declined in all patients
		NA	7	1,508	15 x 20	NA	NA	✓	✓	Salpingectomy Cornual resection	NA	Patient 3 received IV iron to compensate for blood loss	Fertility not assessed (loss of follow-up or no desire for future fertility)
		NA	NA	3,095	20 x 20	NA	NA	✓	Massive	Salpingectomy Cornual resection	2000		
Ravi, et al. [10]	3	Multipara	7	14,100	60	Right	✓	✗	✗	Cornual resection	250	Operative time: 155, 160, and 120 minutes respectively	Followed for 6 weeks, 3, and 3 months respectively
		Grand multipara (Previous tubal pregnancy)	6	31,200	50	Left	✓	✗	✗	Cornual resection	200	Hemostatic techniques: endoclips, sutures, cautery, and Surgicel®	$\beta$ -hCG levels declined in all patients and menses resumed
		Multipara	7	17,900	30	Right	✓	✗	✗	Cornual resection	50		
Lodhi, et al. [11]	3	NA	7	6,041	40	Left	NA	✓	✓	Cornual resection	750		
		NA (Previous ectopic pregnancy)	6	NA (Positive urine test)	50	Left	NA	✓	✓	Massive	3500	Presented with hypovolemic shock, operated as an emergency case using two staplers Required blood transfusion	Followed for 6 months and were doing well with normal menses
		NA	8	35,064	50	Left	NA	✓	✓	Cornual resection	1000	Initial $\beta$ -hCG level was 19,714, underwent medical treatment with MTX but $\beta$ -hCG level continued to rise	Lost to follow-up
Akhtar, et al. [12]	1	G5 P2	7 (Twin)	16,740	25	Left	✓	✗	✗	Salpingectomy Cornual resection	100	Echelon Flex™ Endopath® stapler was used Operative time: 25 minutes	$\beta$ -hCG level declined to the pre-pregnancy level in 3 weeks
Our case	1	G2 P1	7	6,111	27 x 17	Left	✓	✗	✗	Salpingectomy Cornual resection	50	Operative time: 60 minutes	Followed for 3 months, $\beta$ -hCG level declined and menses resumed

EBL: Estimated Blood Loss; G: Gravida; IV: Intravenous; NA: Not Available; P: Para; ✓: Presence; ✗: Absence.

commonly due to late rupture and subsequent hemorrhage [4]. No statistics are available on the occurrence of this specific type of ectopic pregnancies in Bahrain; however, 1 case has been reported back in 2006 [5].

Diagnosis is based on clinical presentation, laboratory investigations ( $\beta$ -hCG levels), and ultrasound findings. Medical and surgical options are offered for management of interstitial pregnancy. Conservative treatment includes expectant management for those with spontaneous decline in  $\beta$ -hCG levels. Systemic Methotrexate (MTX) with single or multiple dose regimens is an option for selected patients. It is particularly appropriate when diagnosis is made early and for hemodynamically stable patients without evidence of ruptured interstitial pregnancy. The most important factor that determines the likelihood of success of MTX is the initial  $\beta$ -hCG level. The success rate of MTX in interstitial pregnancy is 80%, even with  $\beta$ -hCG levels reaching as high as 106,634 mIU/mL and in the presence of fetal cardiac activity. However, about 10-20% of these patients will require surgery for reasons such as rising  $\beta$ -hCG levels, pain or rupture. Other options include local injection with MTX or 20% potassium chloride (KCl) and selective uterine artery embolization [1,6].

Surgical intervention is indicated for patients who are symptomatic and hemodynamically unstable, when rupture of the ectopic mass is likely, in advanced cases (> 7 weeks of gestation), when the ectopic mass is  $\geq$  35 mm in diameter, when MTX use is contraindicated, when conservative management fails, and according to patient preference [1,6].

Surgical approaches include hysteroscopy, laparoscopy, and laparotomy. Hysteroscopy is often employed with laparoscopy or use of ultrasound for procedures such as endometrial resection and cornual evacuation. Laparoscopic approach is used for cornual wedge resection, cornual resection, cornuostomy/salpingotomy, and mini-cornual excision. Lastly, laparotomy can be performed for hysterectomy and cornual resection [7].

Hysteroscopic approach is performed under ultrasound guidance or with the aid of laparoscopy. Evacuation done through this approach is often incomplete to minimize the risk of uterine perforation and future rupture. It is an appropriate option for patients wishing to avoid extensive surgery [8].

Laparoscopic approach is currently the preferred surgical approach in cases of ectopic pregnancy where conservative medical management cannot be employed. According to a systemic review on surgical management of interstitial pregnancy, the advantages of this approach include preservation of uterine architecture, lower surgical morbidity, shorter hospital stay, and faster recovery. Based on the same review, conservative laparoscopic management (cornuostomy, extended salpingostomy, salpingotomy, mini-cornual excision) is

indicated when the size of the ectopic mass is less than 40 mm in diameter, embryonic activity cannot be appreciated, intact uterine cornua are present, and there is a desire for future conception with an absent or damaged contralateral fallopian tube. Conversely, radical laparoscopic management (cornual wedge resection, salpingectomy) is preferred for an ectopic mass  $\geq$  40 mm in diameter, in the presence of a lesion in the uterine cornua or with visible embryonic activity. Cornuostomy is indicated when the ectopic size measures 35-40 mm in diameter while cornual resection is preferred for a size greater than 40 mm and/or in cases of advanced gestational age. This gestational advancement might mean more myometrial invasion and resulting risk of persistence of conception products. Bowel injury due to electrocauterization was a major complication associated with cornual resection and was reported in 354 cases. One of the risks of conservative laparoscopic surgery is the persistence of conception product in up to 5-15% of the cases. This occurrence often necessitates a second surgery which is often performed as an emergency procedure. It is therefore recommended to resort to radical treatment in cases where the ectopic mass is greater than 40 mm in diameter and/or in the presence of fetal cardiac activity. Hemostasis was achieved by injection of vasoconstrictors into the myometrium, sutures, and devices (such as the Endoloop<sup>®</sup> device). These techniques, when used, led to lower blood loss and recorded operative time. Difficulties in securing hemostasis and the presence of extensive adhesions led to conversion to laparotomy. Lastly, despite the presence of different laparoscopic techniques, there is no consensus on a single best technique [6].

Laparotomy and hysterectomy were formerly considered the main modalities of management; probably due to late diagnosis and presentation with rupture and hemorrhage. Current advances in diagnostic modalities including utilization of  $\beta$ -hCG and ultrasound have led to earlier diagnosis, providing an opportunity to employ conservative methods including medical treatment and minimally invasive procedures in the management. It remains an appropriate option in the absence of a skilled laparoscopic surgeon [1,6].

We report a case of left-sided intact interstitial pregnancy managed laparoscopically by cornual resection or cornuectomy with the aid of Endo GIA<sup>™</sup> stapler along with ipsilateral salpingectomy, without rupture or bleeding. Similar management using automatic staplers has been reported and published in literature. Table 2 summarizes the data and management of these cases. All cases presented in the table were managed successfully without any complications.

In conclusion, based on the presented data and from our experience, laparoscopy with the use of devices such as Endo GIA<sup>™</sup> stapler appears to be a feasible and

safe minimally invasive procedure to manage patients with interstitial or cornual pregnancy. It is an appropriate option for patients wishing to preserve fertility. It provides good hemostasis with less operative time [12].

Hospital's research ethical committee approval was obtained and accepted on 20/07/2017 (BDF/R&REC|20t7-150).

### Patient Consent

Obtained.

### Disclosure Statement

The authors declare that they have no conflicts of interest and have nothing to disclose.

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