

Introduction

Cornual ectopic pregnancy (CP) is a rare form of ectopic pregnancy, accounting for approximately 2-4% of all ectopic pregnancies) (1) (2), and is associated with significant maternal morbidity and mortality from rupture and subsequent maternal haemorrhage and/or shock (3). A CP refers to a pregnancy which has implanted into the highly vascular proximal interstitial portion of the fallopian tube, surrounded by less than 5mm of myometrium (4). Pre-rupture diagnosis can be challenging due to the location of these ectopic pregnancies, even with modern ultrasonographic techniques. Furthermore, late diagnosis of these pregnancies does not only lead to potential adverse outcomes, but can also mean that medical treatment (methotrexate) is inadequate.

Various techniques of surgical management of cornual ectopic pregnancy have been described in the literature with no consensus on the best approach. Historically, such procedures were performed via laparotomy but there has been an emerging trend towards the laparoscopic approach. Cornual wedge resection and cornuostomy are the two most common surgical procedures, and mini-cornual excision has also been reported. Laparoscopic cornuostomy is considered to be a more conservative surgical approach with better reproductive outcomes. We present two cases discussing the step-by-step laparoscopic management of CP using cornual resection and cornuostomy techniques.

Acknowledgment: Surgical video of cornuostomy provided by Dr.Derek Lok and Cornual resection by Dr.Tanushree Rao

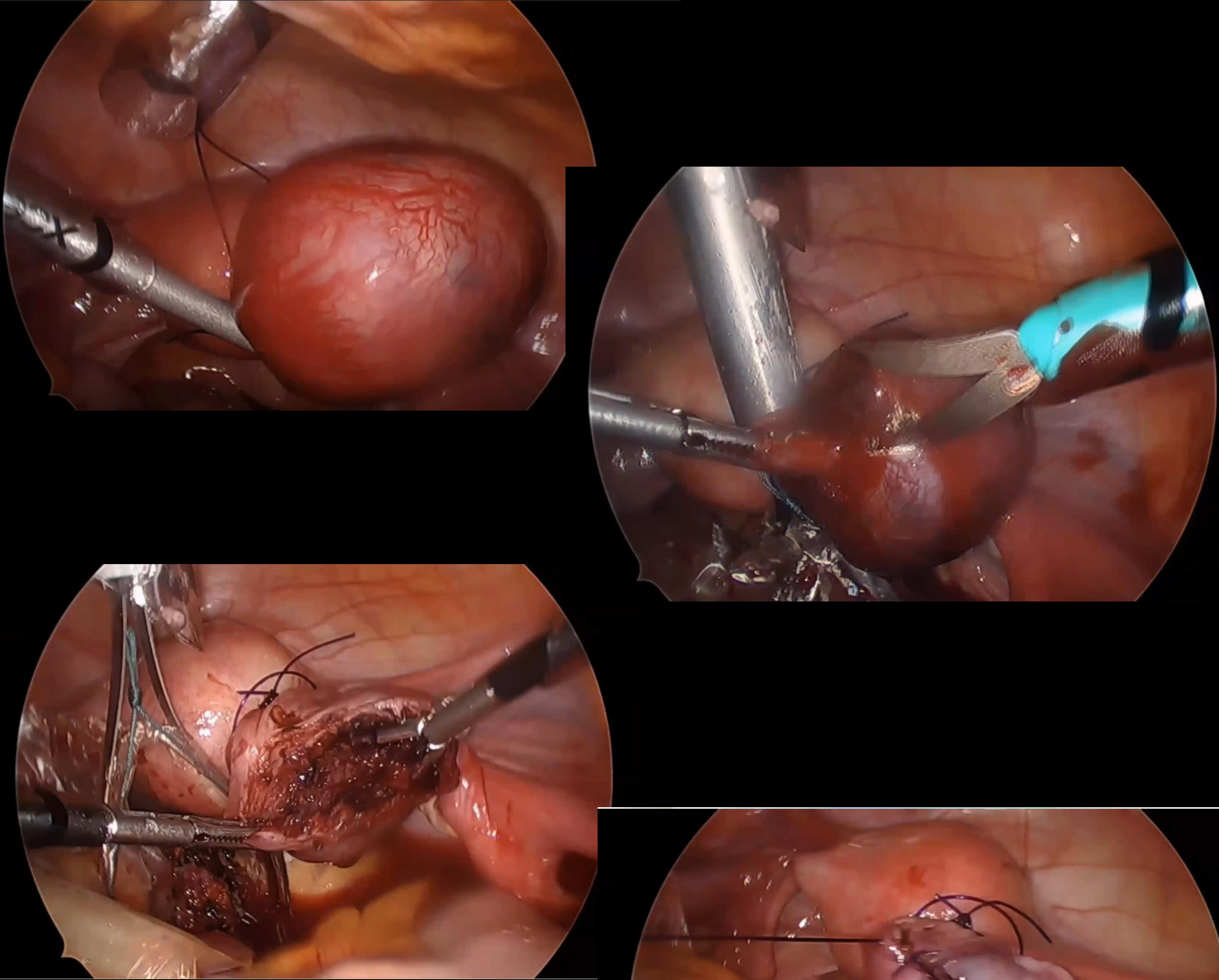
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Case 1 – Laparoscopic cornuostomy

The patient had a diagnostic laparoscopy which demonstrated a cornual ectopic pregnancy situated on the right side of the uterus.

- An endoloop was placed around the base of the cornual ectopic (Fig 1a)
- Diluted vasopressin (20units in 100mL of normal saline solution) was injected into the cornual base
- A cornuostomy was then performed using monopolar scissors (Fig 1b)
- The ectopic pregnancy was grasped and removed from the cornua, placed in an endocatch bag and then removed through a laparoscopic port
- Remaining trophoblastic tissue was removed using a grasper and irrigation (Fig 1c)
- The cornua is then repaired in multiple layers using 0 PDS (Fig 1d)
- Once the repair is complete, and haemostasis achieved, the endoloop is removed (Fig 1e)
- Intercede is applied at the end of the procedure to prevent adhesion formation and a drain sited.



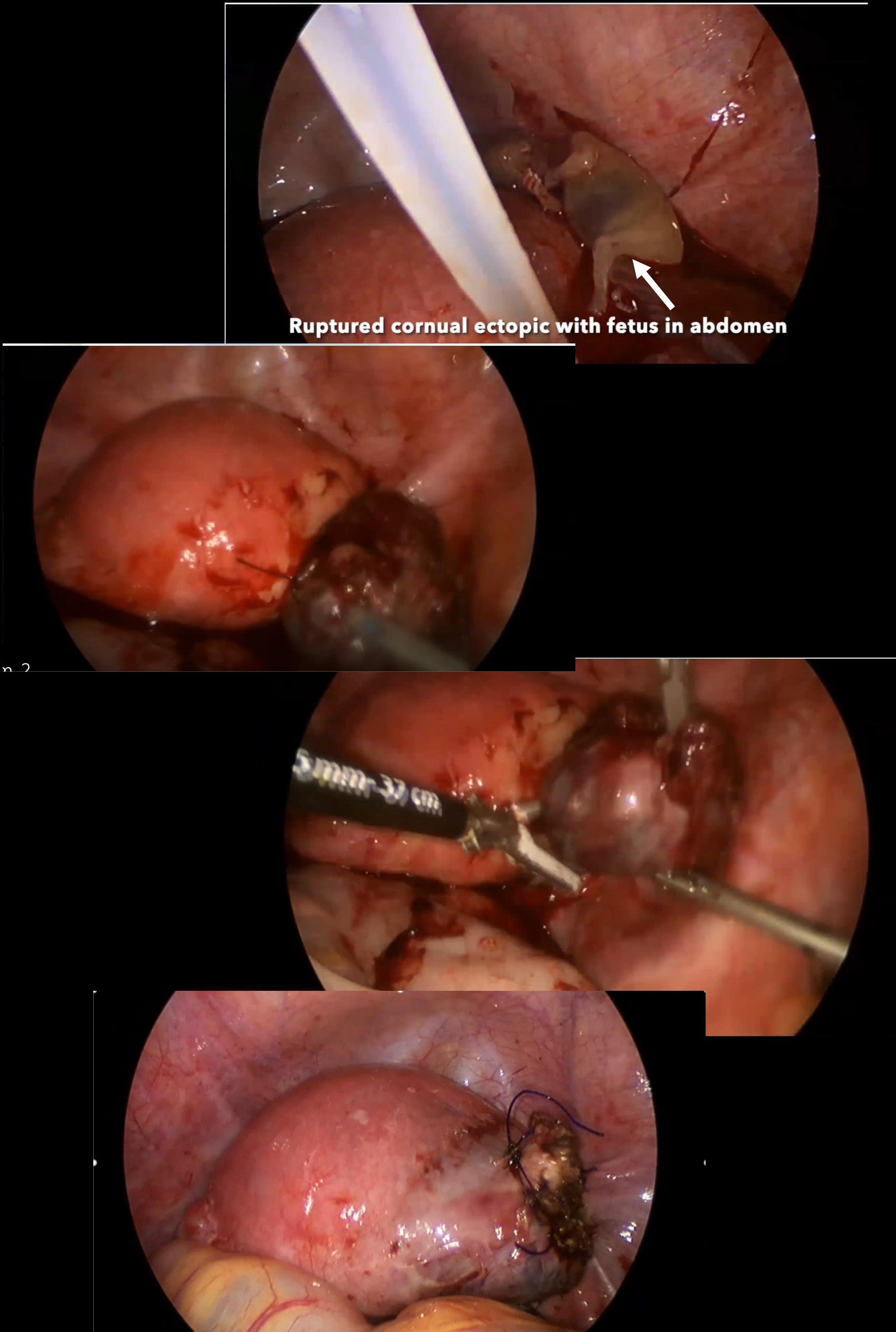
Figures 1a, 1b, 1c and 1d. Intraoperative images of laparoscopic cornuostomy
Figure 1e. Preservation of cornua after cornuostomy

Case 2 – Laparoscopic wedge resection

The patient was taken for an emergency laparoscopy, at which time a ruptured advanced gestation cornual ectopic was found (Fig 2a)

- Again an endoloop is placed around the base of the cornual ectopic (Fig 2b)
- Diluted vasopressin (20units in 100mL of normal saline solution) is injected into the base of the cornua
- Due to the presence of haemoperitoneum and rupture, a wedge resection was performed using Ligasure (Fig 2c)
- The remaining cornual ectopic tissue is removed using an endocatch bag, and in this case the endoloop is left in situ.
- Flowseal is applied at the end of the procedure to assist haemostasis.

Histopathological examination confirmed ectopic tissue in both cases.



Figures 2a, 2b, 2c, and 2d. Intraoperative images of wedge resection

Discussion

- Prompt treatment of CP is critical as it is a life-threatening condition associated with a high mortality rate due to the risk of haemorrhage and shock (1).
- The risk factors for CP are similar to other types of ectopic pregnancy such as assisted reproductive technologies, previous ectopic pregnancy, and pelvic inflammatory disease; with more specific risk factors including ipsilateral salpingectomy, and a rudimentary horn (2).
- Diagnosis is most commonly made using ultrasound, but can be challenging due to the unique location of these pregnancies. MRI has been employed to assist in determining the location of CP (2).
- Early diagnosis and prompt treatment are important to optimise patient outcomes.
- Surgical management may be necessary if the patient is not a candidate for methotrexate, or if an unexpected finding of CP occurs during surgical management of presumptive tubal pregnancy.

- In both cases described, CP was able to be successfully managed with minimally invasive laparoscopic techniques. It is important to note that both women were haemodynamically stable.
- Historically, surgical management of CP has meant laparotomy and possible hysterectomy in cases of ruptured ectopic or uteri, and/or the shocked patient.
- If haemodynamically unstable or evidence of uterine rupture were present, then an open surgical approach may be considered more appropriate.

- Surgical considerations to minimise bleeding include vasopressin injection into the ectopic gestational sac, prophylactic insertion of an Endoloop® or purse-string suture before excision, and temporary ligation of the uterine arteries with vascular clips or clamps (1). Endoloop and vasopressin was used in both cases, with minimal blood loss reported.

- Cornual resection can be accomplished easily with the aid of an advanced bipolar instrument, and some have even described using an endostapler device (2). However, in such cases tubal preservation cannot be assured.
- Cornuostomy has the advantage of preserving the fallopian tube, an important consideration in patients desiring optimisation of future fertility. Due to the minimal excision of myometrial tissue, the myometrial bulk and thickness are preserved, resulting in a scar with good integrity.

- Recent evidence has shown laparoscopic cornuostomy not only takes less time to perform, but results in better future pregnancy outcomes compared to women treated with laparoscopic wedge resection (3).
- A case series by Moon et al detailed 11 women treated with laparoscopic corunostomy who proceeded to have uncomplicated term caesarean sections (5).
- The disadvantage of this procedure is the risk of persistent trophoblastic tissue, necessitating post-operative surveillance and possible requirement for methotrexate (3)
- In a series by Macrae et al of the 11 patients who had laparoscopic management only one required treatment with methotrexate post-operatively (6)
- There is also a risk of uterine rupture at the site of a previous laparoscopic cornuostomy, as well as a concern for uterine rupture in future pregnancies (2). In these instances elective caesarean section has been recommended. Early ultrasound in subsequent pregnancy to identify the location of the pregnancy is also important.

It should also be noted that when performing laparoscopic management of these pregnancies that the potential need for salpingectomy and/or hysterectomy is considered.

Conclusion

Additional research is needed to determine the optimal method of treatment for these ectopic pregnancies. Minimally invasive surgical treatment has been found to be effective in treating these patients with the added benefit of preserving future fertility. When determining the best approach, the expertise of the surgeon and clinical picture are paramount.