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Publication Date

2024-03-01

DOI

10.1016/j.crwh.2024.e00585

Peer reviewed

Case Reports in Women's Health 41 (2024) e00585

Contents lists available at ScienceDirect

Case Reports in Women's Health

journal homepage: www.elsevier.com/locate/crwh

Laparoscopic management of short-interval interstitial pregnancy after recent tubal ectopic pregnancy: A case report

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ARTICLE INFO

Keywords:
Interstitial ectopic pregnancy
Minimally invasive cornuostomy
Case report

ABSTRACT

A 24-year-old woman, G6P2032, initially presented with a right-sided ruptured tubal ectopic pregnancy. Salpingectomy was performed with care to completely remove the fallopian tube. The patient then presented with ipsilateral interstitial pregnancy 11 weeks later and initially underwent systemic methotrexate injection, which failed to resolve the pregnancy. She then underwent laparoscopic cornuostomy and dilation and curettage. Cornuostomy was performed with injection of dilute vasopressin around the gestational sac to help minimize blood loss, followed by hydrodissection and sharp dissection to remove the pregnancy. Judicial electrocautery was used and the myometrium and serosa were closed in layers. Attention was given to preserve uterine myometrial tissue integrity at the cornua.

The patient recovered and was discharged. Her beta-hCG level trended from 11,902 mIU/mL pre-surgery to 7726 on postoperative day 0, and 289 on postoperative day 7. Pathology from the interstitial region showed fragments of chorionic villi, and the dilation and curettage pathology demonstrated decidualized secretory endometrium.

Short-interval interstitial ectopic pregnancies after prior salpingectomy for tubal ectopic pregnancy are extremely rare. This case demonstrated successful management with a minimally invasive laparoscopic cornuostomy. This case also displays that ipsilateral interstitial pregnancy can occur after salpingectomy even after care is taken to remove all visible portions of the fallopian tube. Thus, patients should be counseled carefully about the risks of short-interval pregnancy after a recent tubal ectopic pregnancy.

1. Introduction

Interstitial pregnancy is defined as implantation of an embryo in the proximal fallopian tube that is embedded within the muscular wall of the uterus. These ectopic pregnancies are uncommon and reported incidence ranges between 1% and 4% of ectopic pregnancies. Interstitial ectopic pregnancies that occur after prior salpingectomy, sometimes called tubal stump pregnancies, are extremely rare, estimated to be about 0.4% of all ectopic pregnancies [1]. Reported risk factors for interstitial ectopic pregnancy after prior salpingectomy include in vitro fertilization after salpingectomy, a short interval between salpingectomy and conception, and a history of incomplete salpingectomy [2]. The unique anatomic location of interstitial ectopic pregnancies increases the risk of uterine rupture and life-threatening hemorrhage. Optimal treatment guidelines for interstitial ectopic pregnancies have not been established due to the rarity of the condition, but the elevated morbidity and mortality rate in comparison with tubal ectopic pregnancies make it an urgent condition. Previous case reports and case series have described medical management with methotrexate, as well as surgical management with laparotomy, laparoscopy, and hysteroscopy. This case report describes a case of a short-interval interstitial ectopic pregnancy managed with minimally invasive laparoscopic cornuostomy after prior ipsilateral laparoscopic salpingectomy for a previously ruptured ectopic pregnancy.

2. Case Presentation

A 24-year-old woman, G6P2032, presented with a positive urine pregnancy test and a beta-hCG level of 2396 mIU/mL. Her medical history was notable for right-sided ectopic pregnancy that required laparoscopic salpingectomy after tubal rupture 11 weeks prior. The entire right tube was removed and transected at the cornua. Pathology

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https://doi.org/10.1016/j.crwh.2024.e00585
Received 17 January 2024; Received in revised form 29 January 2024; Accepted 30 January 2024
Available online 1 February 2024

Table 1
Beta hCG trends.

Day	Beta hCG (mIU/mL)
Day 1	2396
Day 3 (MTX given)	4861
Day 6	8456
Day 9 (Surgery day)	11,902
Post-op day 1	7726
Post-op day 8	289
1 Month Post-op	< 1.2

was consistent with fallopian tube with luminal chorionic villi consistent with tubal ectopic pregnancy. The patient was discharged and began taking combined oral contraceptive pills for contraception.

2.1. Clinical Findings, Timeline and Diagnostic Assessment

After initial re-presentation concerning for pregnancy of unknown location, beta-hCG at 48 h had risen to 4861 mIU/mL. Ultrasound findings were notable for an ovoid, thick-walled, cystic structure in the right adnexa with a possible yolk sac. No fetal pole or cardiac activity were noted. Findings were concerning for an ectopic pregnancy, possibly interstitial in location. Having undergone a laparoscopic right salpingectomy for a ruptured tubal ectopic pregnancy 11 weeks prior, the patient initially desired to avoid surgical management and methotrexate was administered. However, repeat beta-hCG measurements continued to rise to 8456 mIU/mL and then 11,902 mIU/mL (Table 1). Repeat ultrasound findings 6 days after initial ultrasound showed a likely right interstitial ectopic pregnancy at the right uterine cornua with a yolk sac, gestational sac, and fetal pole measuring 5 weeks and 6 days (Fig. 1A, B, C). Given the growth of the pregnancy and interval increase in beta-hCG despite methotrexate administration, surgical intervention was recommended.

2.2. Therapeutic Intervention and Surgical Management

The patient underwent surgical management with laparoscopic cornuostomy and dilation and curettage (Fig. 2). Upon abdominal entry with the laparoscope, a 3 cm right interstitial ectopic pregnancy ballooning through the right cornua was noted (Fig. 2A). A 0 V-Loc suture was anchored medial to the bulge of the serosa and held on tension for manipulation as well as for ease of initiation of rapid suturing in case bleeding was encountered during dissection (Fig. 2B). The area around the bulge was injected with 5 cc of dilute vasopressin (20u in 50 mL of normal saline). Monopolar laparoscopic scissors were used to incise the serosa over the bulge. The ectopic was carefully dissected and removed using a small amount of cautery and hydro-dissection with an irrigation device from the underlying myometrium (Fig. 2C–E). The surrounding myometrium was then closed in layers with the already anchored V-Loc suture (Fig. 2F). A suction dilation and curettage was performed under laparoscopic visualization to ensure no perforation occurred. A significant amount of tissue was removed from the suction dilation and curettage. A Nexplanon device was placed in the arm for contraception. Pathology from interstitial pregnancy removal showed chorionic villi consistent with gestational tissue. Pathology from the suction dilation and curettage showed decidualized secretory endometrium. Total estimated blood loss was 100 mL.

2.3. Follow-up and Outcomes

The patient recovered well and was discharged home. Follow-up beta-HCG levels trended down to 7726 mIU/mL (post-operative day 1), 289 mIU/mL (post-operative day 8), and eventually were undetectable (Table 1). About 9 months post-operatively, the patient desired elective pregnancy. Her Nexplanon was removed and she became spontaneously pregnant with a normal intrauterine pregnancy and was in her second trimester at the time of writing.

3. Discussion

Spontaneous interstitial ectopic pregnancies after prior salpingectomy are extremely rare. They are radiologically and histologically distinct due to their unique location in the interstitium of the fallopian tube without surrounding endometrium [3]; thus, these cases are exceptionally uncommon after a prior salpingectomy, especially where care is taken to completely resect the entire fallopian tube. Short-interval pregnancy, in vitro fertilization, and history of incomplete salpingectomy can all increase the risk of interstitial ectopic pregnancies [2]. In the largest published study, of 414 interstitial pregnancies, only 46 (11.1%) occurred after ipsilateral salpingectomy and 43.5% of those pregnancies had occurred after in vitro fertilization embryo transfer [4]. Furthermore, the interval between pregnancies has been reported to be as short as 2 months to as long as 204 months, with a median of 24 months [4]. A case series of 9 interstitial pregnancies after salpingectomy showed the mean interval from prior salpingectomy to subsequent pregnancy was 4.3 months [5]. However, these ectopic pregnancies can still occur and be managed with minimally invasive laparoscopic techniques as demonstrated in this case report.

Therapeutic options for interstitial ectopic pregnancies include expectant management, medical therapy with methotrexate, and both open and minimally invasive surgeries. Several different techniques for minimally invasive removal of interstitial pregnancies have been described in the literature, including laparoscopic cornual wedge resection, laparoscopic cornuostomy, and hysteroscopic techniques. Given the rarity of these cases and smaller cohorts, comparison of cornual wedge resection, which includes removal of the myometrium, and cornuostomy, which involves removal of only the ectopic pregnancy and interstitium, have shown comparable outcomes [6]. However, cornuostomy may have advantages, including shorter operative times [6], preservation of myometrium, and decreased risk of subsequent uterine rupture [7]. Some minimally invasive surgeons have proposed hydrodissection during cornuostomy as a method to improve preservation of myometrium at the site of cornuostomy [8]. As seen in this case, cornuostomy can be safely and effectively performed with hydrodissection around the site of the pregnancy with the assistance of vasopressin to reduce blood loss at the site.

This case report demonstrates an extremely rare case of an interstitial pregnancy occurring only 11 weeks after complete resection of the ipsilateral fallopian tube at the cornua. Thus, the pathogenesis is possibly unrelated to a remaining tubal remnant, as taking care to remove the entire tube may not prevent this phenomenon. The pathogenesis of this event may be related to weakness of the cornua after removal of the tube, healing or scar tissue in that area, or opening of the cornua from the tubal removal site that the fertilized ovum traveled to and implanted into. Physicians should counsel patients about the importance of pregnancy prevention for at least 3 months after salpingectomy for tubal ectopic for healing purposes, although prior studies demonstrate this can occur as long as 24 months or more from prior salpingectomy. However, the exact time frame to prevent interstitial ectopic pregnancy is difficult to determine given the rarity of this presentation.

Contributors

Megan Bernstein contributed to the conception of the case report and patient care, drafted the manuscript, undertook the literature review, and revised the article critically for important intellectual content.

Michelle Han contributed to the conception of the case report and patient care, drafted the manuscript, undertook the literature review, and revised the article critically for important intellectual content.

Both authors approved the final submitted manuscript.

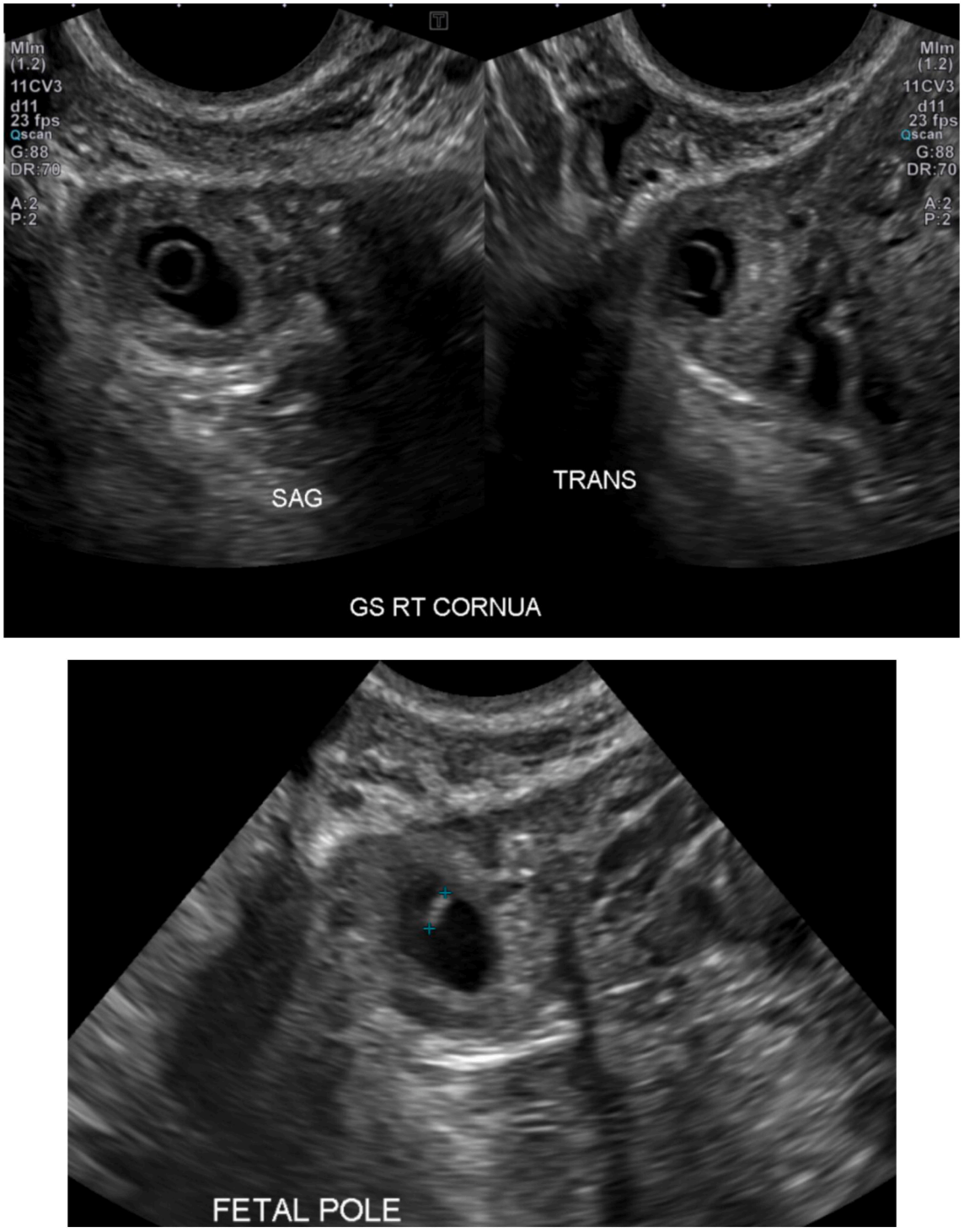

Fig. 1. Radiologic assessment.
A. Sagittal and transverse ultrasound views of right interstitial pregnancy.
B. Ultrasound views of fetal pole.
C. Ultrasound views of pregnancy located in the right uterine cornua.

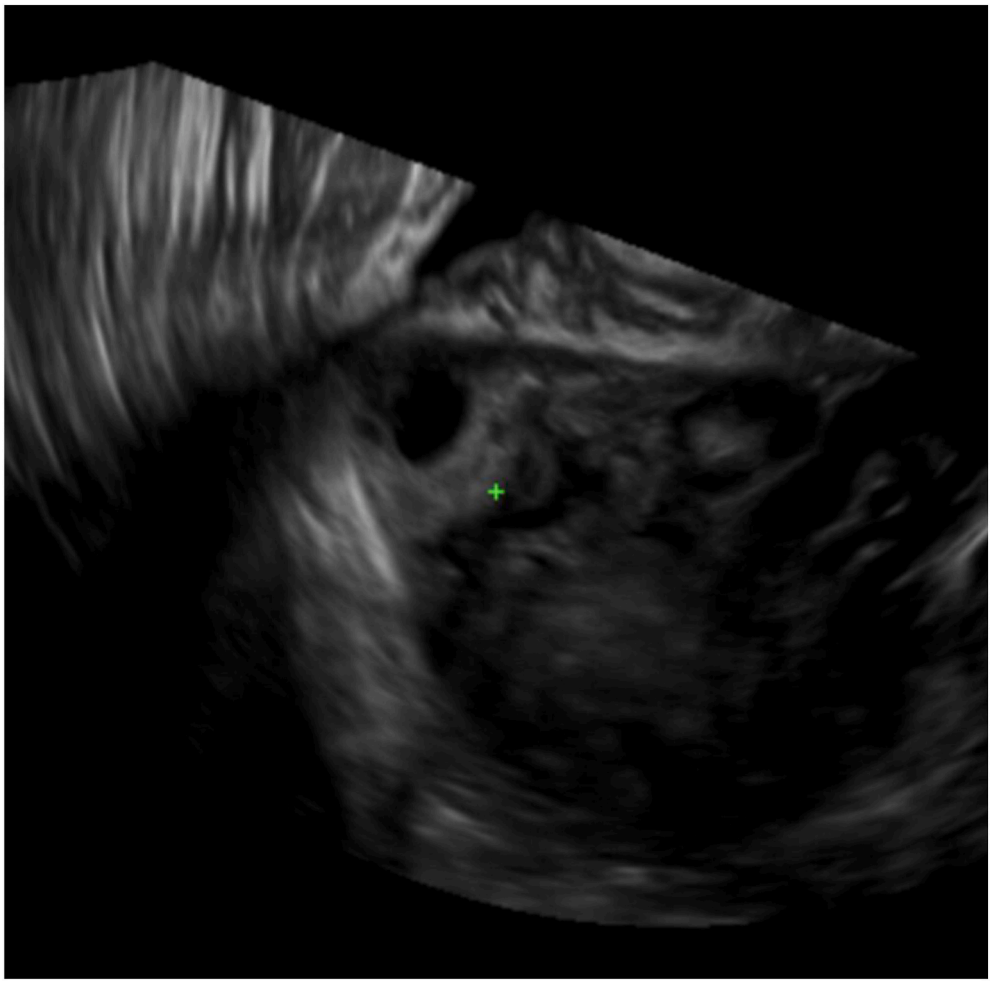

Fig. 1. (*continued*).

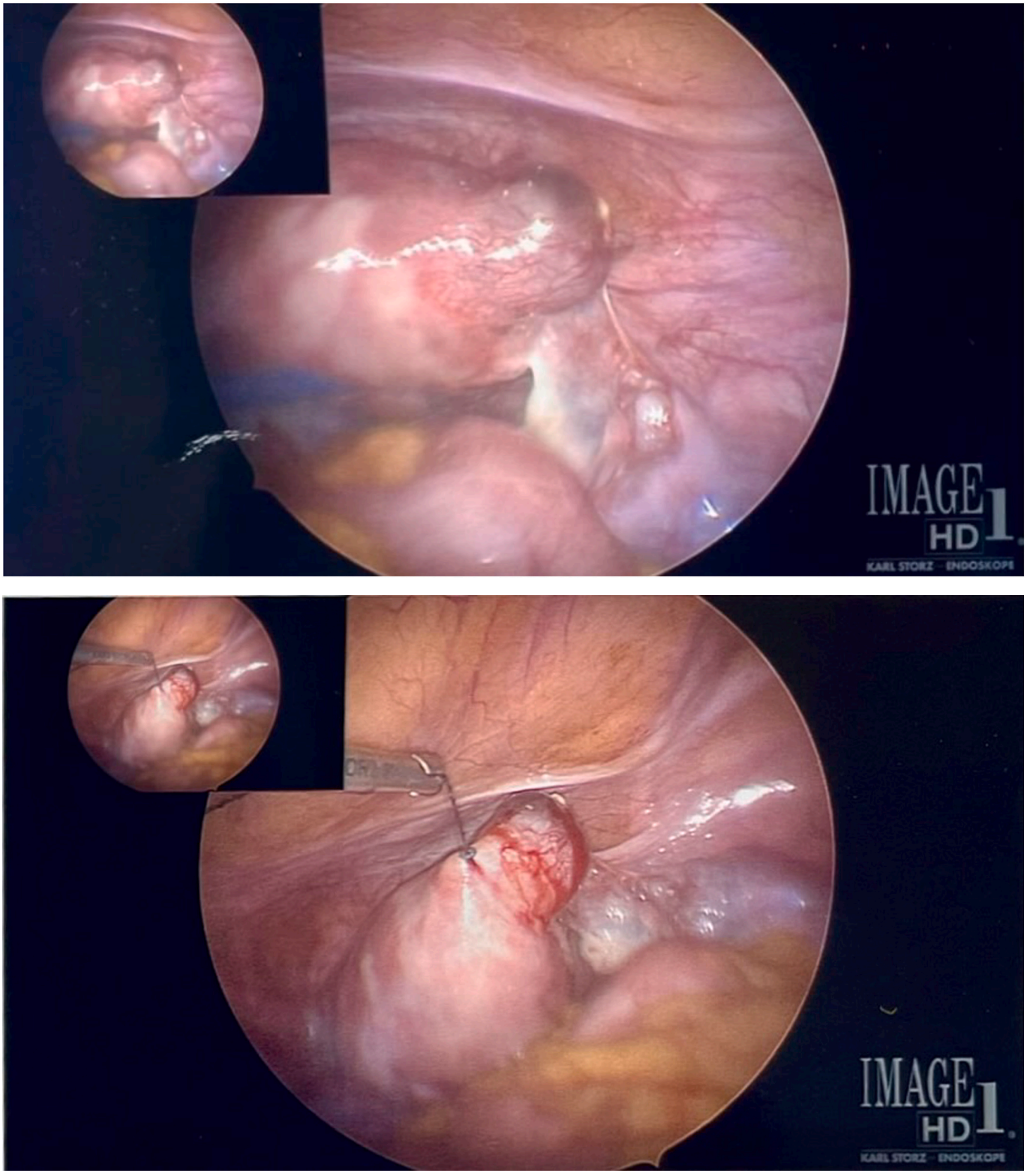

Fig. 2. Surgical photos.
A. Interstitial pregnancy noted at right uterine cornua.
B. V-Loc suture used to anchor the serosa for manipulation.
C. Dissection of ectopic pregnancy with monopolar scissors.
D. Ectopic pregnancy fully removed.
E. Cautery of the serosal edges for hemostasis.
F. Myometrial closure with V-Lock suture.

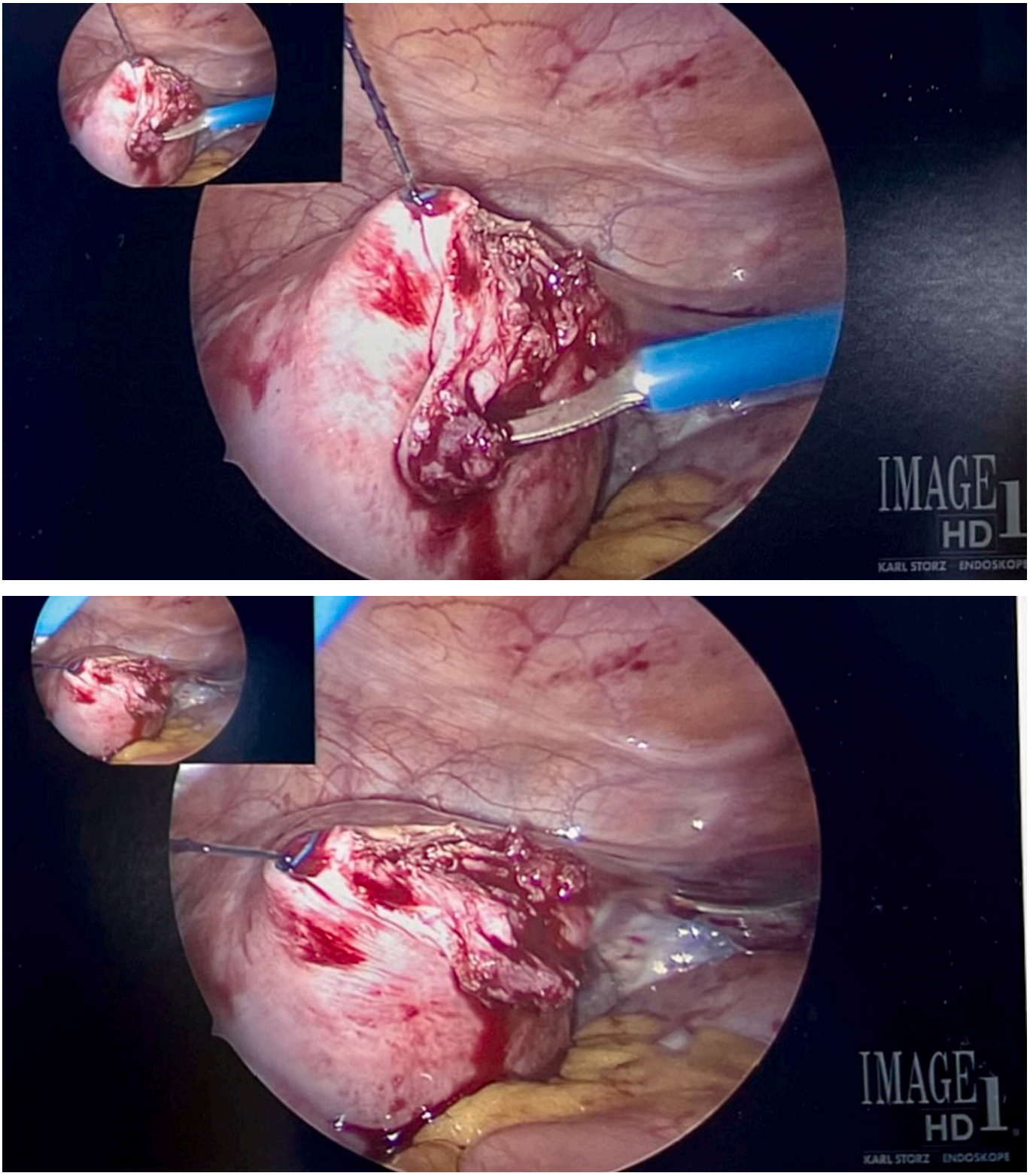

Fig. 2. (*continued*).

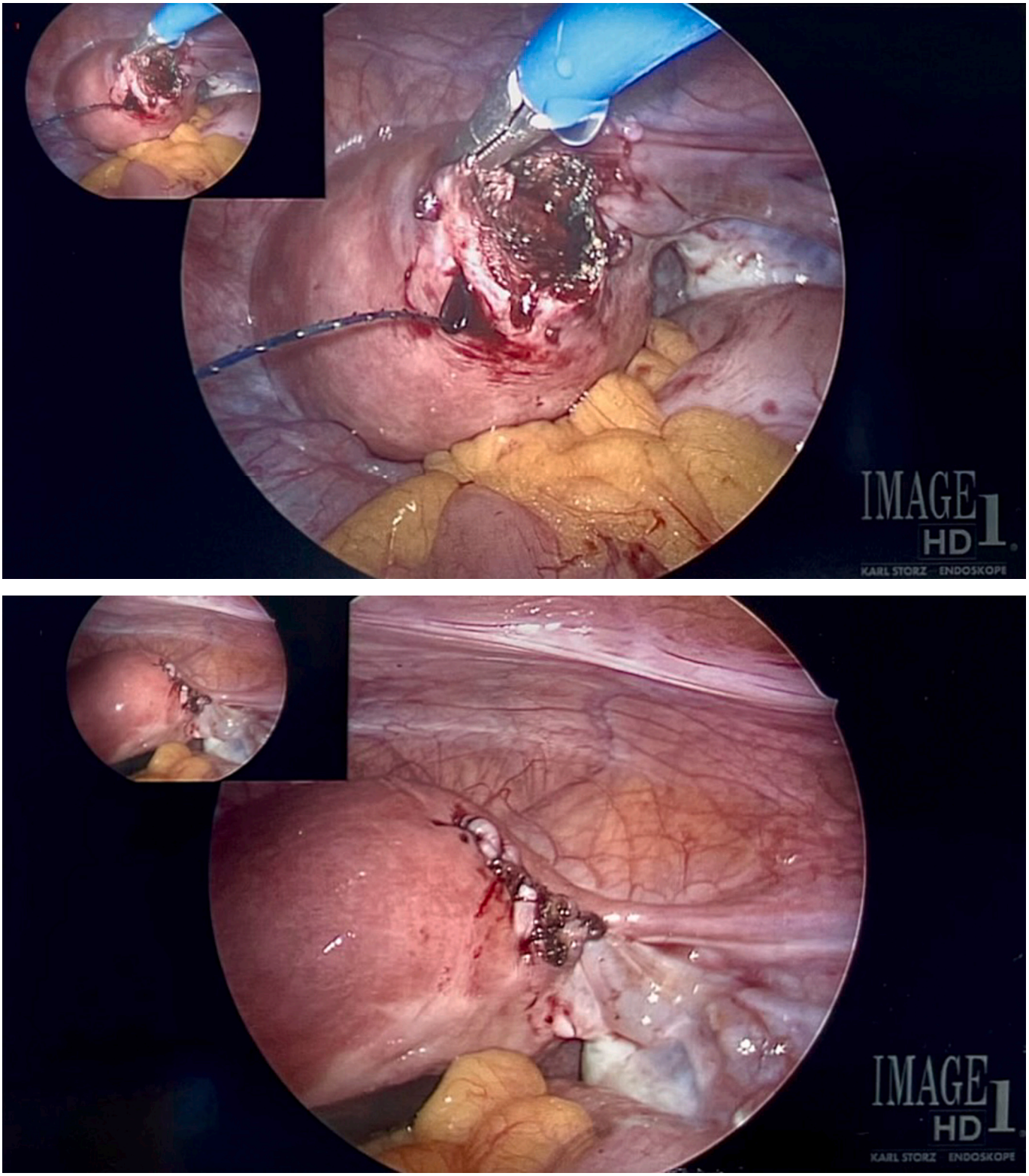

Fig. 2. (*continued*).

Funding

This work did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Patient consent

Written informed consent was obtained from the patient for publication of the case report and accompanying images.

Provenance and peer review

This article was not commissioned and was peer reviewed.

Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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