

Case Report: World's First Single-Incision-Laparoscopic Surgery (SILS) for Cornual Pregnancy

S Teo, J Mohd, B Chern

ABSTRACT

Introduction: Cornual pregnancies are rare ectopic gestations that have a greater risk of haemorrhage. We present the world's first documented case of cornual pregnancy managed by Single-Incision Laparoscopic Surgery (SILS).

Clinical picture: The patient had abdominal pain and vaginal bleeding at 7 weeks gestation and clinical investigations led to a strong suspicion for a cornual pregnancy.

Treatment: Laparoscopy was performed using the SILS port, which confirmed the cornual pregnancy. Laparoscopic cornuostomy and evacuation of conceptus was performed through a single port at the umbilicus on 9 September 2009.

Outcome: The cornual pregnancy was successfully removed and the patient was discharged home the next day. Her umbilical port scar achieved excellent cosmesis.

Conclusion: SILS allows us to offer cosmetically superior scars while still achieving similar therapeutic targets as conventional laparoscopy. But we should be discerning in selecting patients for SILS, according to complexity of the surgery and the surgeon's level of competence.

Case Report: Single-Incision-Laparoscopic Surgery (SILS) for Cornual Pregnancy

Authors:

Dr Steven Teo
MBBS MRCOG MMed (O&G)
Registrar, Division of O&G,
KK Women's & Children's Hospital

Dr Jasmine Mohd
MBBS MRCOG
Associate Consultant, MIS Unit,
KK Women's & Children's Hospital

A/Prof Bernard Chern
MBBS MRCOG MMed (O&G) FAMS
Senior Consultant & Head,
Department of O&G,
KK Women's & Children's Hospital

Correspondence:

Dr Steven Teo
Department of O&G,
Basement 1, Women's Tower
KK Women's & Children's Hospital
100 Bukit Timah Road
Singapore 229899
Tel: +65 92788309 Fax: +65 62840463

INTRODUCTION

Cornual pregnancies are rare ectopic gestations that develop in the area of the uterine horn and the proximal (interstitial) end of the fallopian tube that traverse the uterine wall. Owing to its unique location, cornual pregnancies pose a great challenge to the clinician in terms of diagnosis and management. These pregnancies may present at a more advanced gestation than the commoner tubal ampullary ectopic pregnancies, leading to greater risk of haemorrhage. As surgical management may entail uterine cornual resection or cornuostomy, such procedures, when performed via laparoscopy will test the surgeon's ability to secure adequate haemostasis while ensuring clearance of the trophoblastic tissues¹⁻⁴.

With the introduction of Single-Incision Laparoscopic Surgery (SILS) to our centre, our patients now benefit from the advantages of having only a single umbilical incision through which the entire surgery may be performed. We present the first documented case of cornual pregnancy managed by SILS. To our knowledge this is the first case in the world at the time of writing.

CASE HISTORY

The patient was a healthy 33-year-old Myanmar lady with no significant medical history. Her menstrual

cycles had been painless and regular, occurring every 30 days; the last period was on 22 July 2009. She presented to KK Women's and Children's Hospital on 9 September 2009 at 7 weeks of amenorrhoea after experiencing abdominal pain and vaginal bleeding. She had tested positive for pregnancy using the home urine test kit earlier.

She was very stable when seen at our Women's 24-hour clinic and the abdomen was soft with minimal tenderness. The vaginal examination revealed a tubular cervix with a closed os and only a small amount of blood stain, there was no cervical excitation, although some discomfort was experienced during bimanual palpation of the gravid uterus. The uterine size corresponded to the duration of amenorrhoea. A bedside transvaginal ultrasound scan was performed and it demonstrated a thick trophoblastic ring in the area of the right cornual region of the uterus (Fig 1), measuring 3.5cm x 3.0cm. This mass did not appear to be in continuity with the rest of the endometrial cavity, which was empty. There was no yolk sac or fetal pole identified. A subsequently ultrasound scan by the duty radiologist confirmed the uterine findings and also demonstrated normal ovaries, as well as absence of extra-uterine pathology or haemoperitoneum. The clinical presentation and sonographic findings, paired with a beta-HCG level of 18,000 IU/L led to the strong suspicion of a right cornual pregnancy.

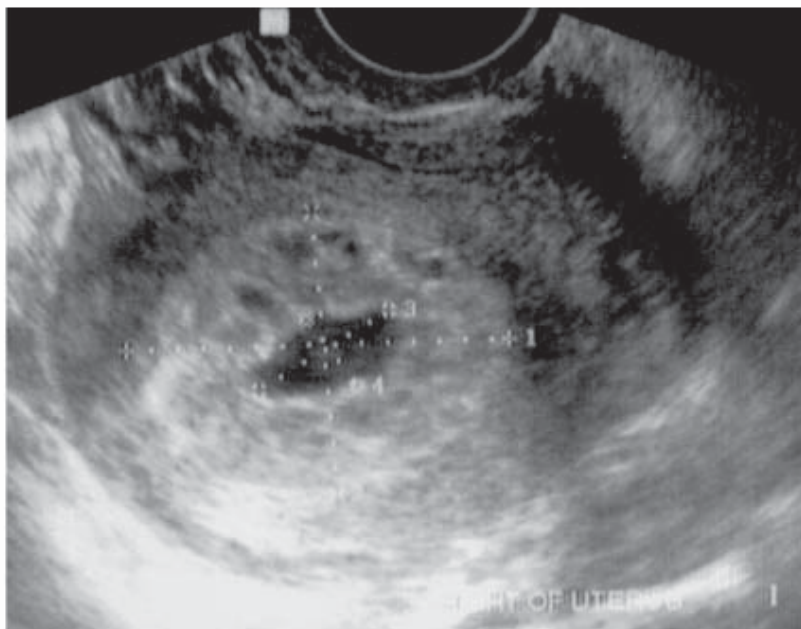


Fig 1. Sonographic image of right cornual pregnancy

A decision was made together with the patient for an urgent diagnostic laparoscopy, with permission for therapeutic resection of any ectopic gestation. This was performed via the Single-Incision Laparoscopic Surgery (SILS) multi-channel port at the umbilicus on 9 September 2009. The presence of an unruptured right cornual pregnancy was confirmed at laparoscopy (Fig 2). In view of the large size of the cornual pregnancy and potential loss of significant uterine volume if a wedge resection was undertaken, we decided to perform a cornuostomy procedure instead. Vasopressin was administered to the area around the right cornu (Fig 3) with good haemostatic effect noted. An incision of approximately 2-3cm was made at the right cornu with unipolar diathermy until the gestational sac was visualized (Fig 4); precaution was taken to avoid the vicinity of the fallopian tube. Thereafter, the entire gestational sac with attached trophoblastic tissues was flushed out of the cornu with saline (Fig 5). Haemostasis was well secured by the pre-emptive use of vasopressin. The uterine cornual defect was subsequently close in two layers (Fig 6): primary closure was with figure-of-eight Vicryl sutures and reinforced with interrupted Monocryl sutures. Both intra-corporeal and extra-corporeal knot tying techniques were used. The entire surgery was performed via the SIL port and specialized instruments with relative ease and the end-result was evacuation

of the cornual pregnancy with satisfactory closure of the cornual defect and haemostasis. The surgery was performed using 5mm instruments and ports, while specimen was retrieved through a 10mm port, all done via the SIL port.

The patient tolerated the procedure very well and started to ambulate and eat the next morning. There was minimal pain experienced at the incision site. In view of the possibility of remnant trophoblastic tissues in the right cornu, methotrexate was administered and the subsequent beta-HCG trend monitored. As a prophylactic measure to avoid the complications of scar rupture, the patient was counseled to have an early elective caesarean section upon fetal maturity (by the 37th week of gestation) in her subsequent pregnancies.

This patient recovered very quickly after surgery and was home on the second day. Her serum beta-HCG level was monitored and found to be decreasing satisfactorily from 18,000IU/L before surgery, to 5,700IU/L on the day after surgery and finally to 717IU/L and 165IU/L on the 5th and 9th post-operative days respectively. She was reviewed on the 9th day and was found to have a well-healing wound cosmetically hidden in the base of the inverted umbilicus (Fig 7). She was very pleased with the surgical outcome.

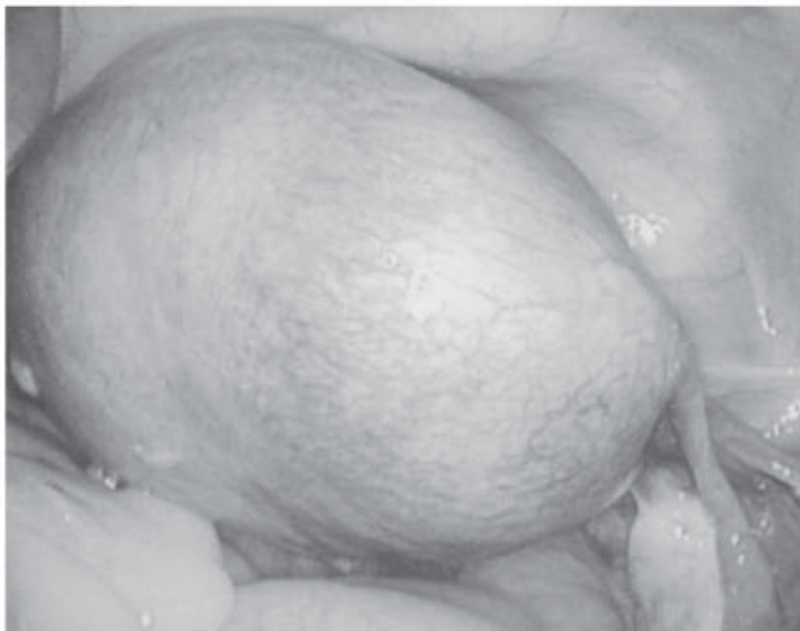


Fig 2. Diagnosis of cornual pregnancy

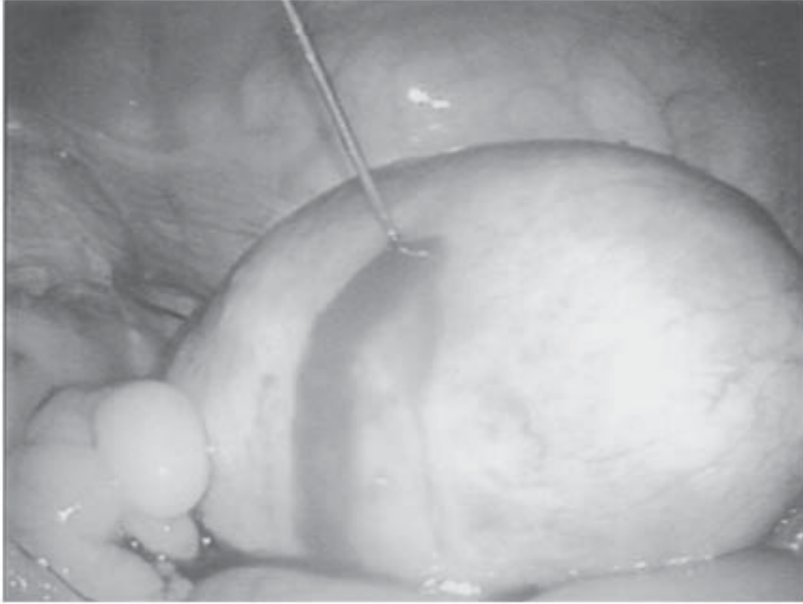


Fig 3. Vasopressin injection

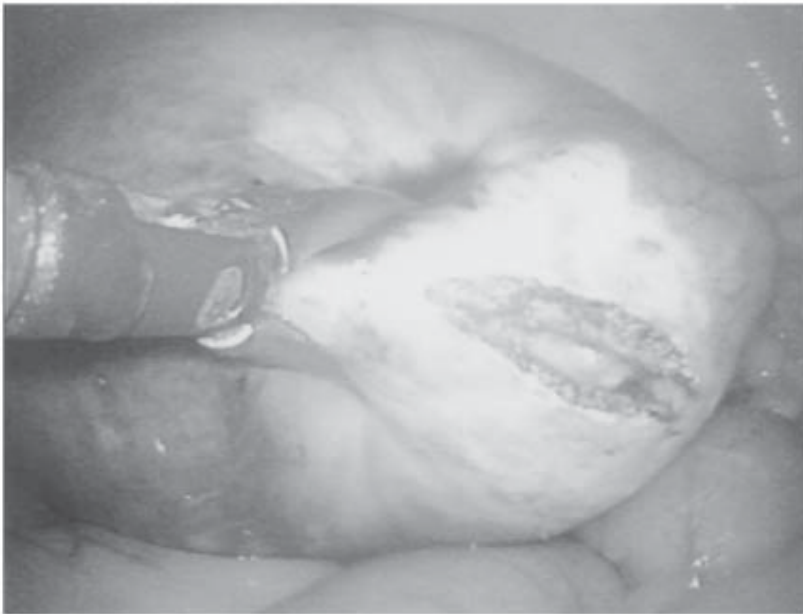


Fig 4.™ Cornuostomy

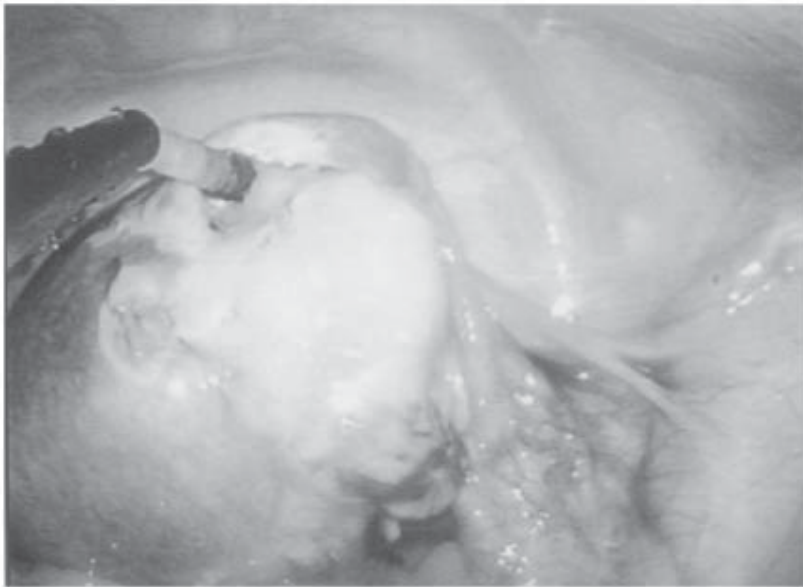


Fig 5. Evacuation of conceptus

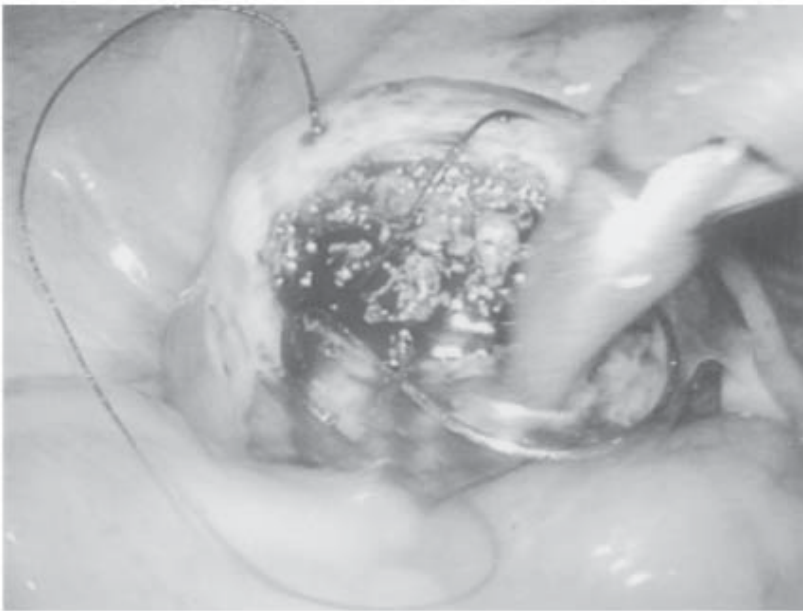


Fig 6. Suturing

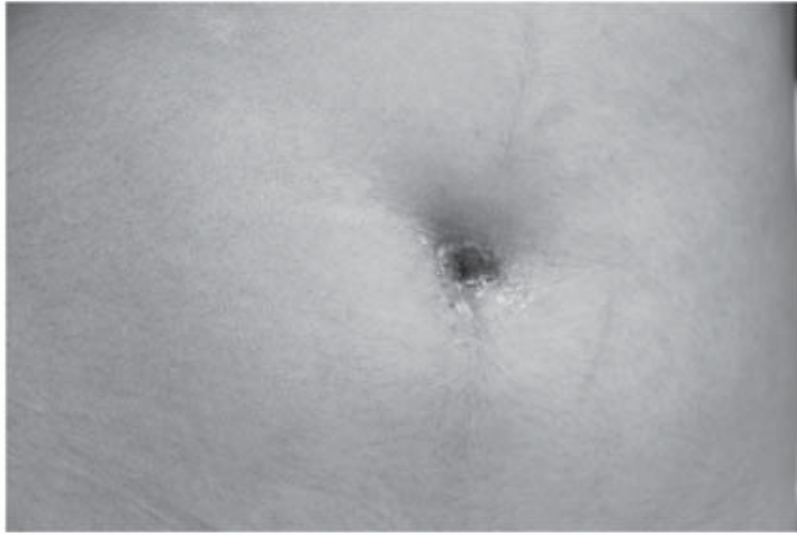


Fig 7. The umbilical scar at 1-week

DISCUSSION

Cornual pregnancies are rare compared to tubal ectopic pregnancies and are more difficult to diagnose with confidence. As the gestational sac is located within the boundaries of the uterine wall itself, it may be mistaken for an intra-uterine pregnancy. It is imperative to differentiate the two, as any delay would predispose the patient with a cornual pregnancy to the risk of fatal haemorrhage⁵.

There are numerous authors who have reported different techniques in the management of cornual pregnancies, ranging from hysterectomy, wedge resection and cornuostomy, to transcervical evacuation and methotrexate^{6-10, 17, 18}. Even in cases of ruptured cornual pregnancies, successful management with laparoscopy have been detailed in the literature, reinforcing the paradigm shift towards laparoscopy as the primary surgical method in all but the haemodynamically unstable^{1-4, 5, 9, 11-14}. Although several laparoscopic techniques have been described^{6, 7, 15, 16}, but we present the first case ever to be successfully managed with the use of the SILS port.

The SILS multi-channel port used in this case is manufactured by Covidien and is designed to be placed at the umbilicus through a 2cm incision. It can accommodate up to 3 laparoscopic instruments simultaneously, including one of 10mm caliber. Several variants of the single-incision laparoscopy ports are also available in the market, each with its own unique advantages and disadvantages. Much as laparoscopic surgery has gained acceptance over laparotomy in an increasing number of procedures,

the natural evolution of laparoscopic surgery mandates that the necessary step towards the future is in the reduction of number of incisions¹⁹. SILS has been used in many surgical disciplines since its introduction, and we now add the management of cornual pregnancy to the rapidly expanding list of SILS procedures in gynaecology²¹.

Compared to multi-port laparoscopy, SILS has the undeniable advantage of having only one abdominal scar which is easily concealed within the inverted umbilicus. This is achieved while maintaining the laparoscopic benefits of reduced post-operative pain and faster recovery requiring shorter hospital stay. This eventually translates into potential cost-savings and greater patient satisfaction.

However, we wish to highlight that the less familiar operator and his assistant may find the limited maneuverability at the SILS port obstructive to conventional laparoscopic movements. This is most evident during suturing and intra-corporeal knot tying. Therefore, in the case of cornual pregnancy, where there is significant risk of uterine rupture in future pregnancies, we recommend extra-corporeal knot typing with a knotpushing instrument to ensure optimal opposition of the uterine wall.

As laparoscopists grow more proficient at using the specialized angular instruments designed for SILS, we foresee that the SILS technique will have increasing applications in the field of minimally invasive gynaecological surgery. With the advent of singleincision laparoscopy, the evolution of gynaecological laparoscopy continues.

REFERENCES

1. Ng S, Hamonri S, Chua I, Chern B, Siow A. Laparoscopic management of 53 cases of cornual ectopic pregnancy. *Fertil Steril* 2009;92(2):448-52
2. Soriano D, Vicus D, Mashlach R, Schiff E, Seidman D, Goldenberg M. Laparoscopic treatment of cornual pregnancy: a series of 20 consecutive cases. *Fertil Steril* 2008;90(3):839-43
3. MacRae R, Olowu O, Rizzuto MI, Odejinmi F. Diagnosis and laparoscopic management of 11 consecutive cases of cornual ectopic pregnancy. *Arch Gynecol Obstet* 2009;280(1):59-64
4. Chern B, Tan KH. Laparoscopic excision of adenomatoid tumour at cornu of the uterus and cornual (interstitial) pregnancy. *Gynaecological Endoscopy* 2001;9(5):319-21
5. Chen GD, Lim MT, Lee MS. Diagnosis of interstitial pregnancy with sonography. *J Clin Ultrasound* 1994;22(7):439-42
6. Ross R, Lindheim SR, Olive DL, Pritts EA. Cornual gestation: a systematic literature review and two case reports of a novel treatment regimen. *J Minim Invasive Gynecol* 2006;13(1):74-8
7. Lau S, Tulandi T. Conservative medical and surgical management of interstitial ectopic pregnancy. *Fertil Steril* 1999;72(2):207-15
8. Benifla JL, Fernandez H, Sebban E, Darai E, Frydman R, Madelenat P. Alternative to surgery of treatment of unruptured interstitial pregnancy: 15 cases of medical treatment. *Eur J Obstet Gynecol Reprod Biol.* 1996;70(2):151-6
9. Tan HK, Tay SK. Laparoscopic treatment of ectopic pregnancies – a study of 100 cases. *Ann Acad Med Singapore* 1996;25(5):665-7
10. Darai E, Benifla JL, Naouri M, Pennehouat G, Guglielmina JN, Deval B, Filippini F, Crequat J, Madelenat P. Transvaginal intratubal methotrexate treatment of ectopic pregnancy. Report of 100 cases. *Hum Reprod.* 1996;11(2):420-4
11. Choi YS, Eun DS, Choi J, Shin KS, Choi JH, Park HD. Laparoscopic cornuotomy using a temporary tourniquet suture and diluted vasopressin injection in interstitial pregnancy. *Fertil Steril* 2009;91(5):1933-7
12. Takeda A, Manabe S, Mitsui T, Nakamura H. Management of patients with ectopic pregnancy with massive hemoperitoneum by laparoscopic surgery with intraoperative autologous blood transfusion. *J Minim Invasive Gynecol.* 2006;13(1):43-8
13. Chan LY, Yuen PM. Successful treatment of ruptured interstitial pregnancy with laparoscopic surgery. A report of 2 cases. *J Reprod Med* 2003;48(7):569-71
14. Grimbizis GF, Tsalikis T, Mikos T, Zepiridis L, Athanasiadis A, Tarlatzis BC, Bontis JN. Case report: laparoscopic treatment of a ruptured interstitial pregnancy. *Reprod Biomed Online* 2004;9(4):447-51
15. Moawad NS, Dayaratna S, Mahajan ST. Mini-cornual excision: a simple stepwise laparoscopic technique for the treatment of cornual pregnancy. *JSLs* 2009;13(1):87-91
16. Gezer A, Mutlu H. Laparoscopic management of cornual pregnancy without sutures. *Arch Gynecol Obstet* 2004;270(3):194-6
17. Yao M, Tulandi T, Falcone T. Treatment of ectopic pregnancy by systemic methotrexate, transvaginal methotrexate and operative laparoscopy. *Int J Fertil Menopausal Stud.* 1996;41(5):470-5
18. Thakur Y, Coker A, Morris J, Oliver R. Laparoscopic and ultrasound-guided transcervical evacuation of cornual ectopic pregnancy: an alternative approach. *J Obstet Gynecol* 2004;24(7):809-10
19. Curcillo PG 2nd, Wu AS, Podolsky ER, Graybeal C, Katkhouda N, Saenz A, Dunham R, Fendley S, Neff M, Copper C, Bessler M, Gumbs AA, Norton M, Iannelli A, Mason R, Moazzez A, Cohen L, Mouhllas A, Poor A. Single Port Access (SPA) Minimal Access Surgery Through a Single Incision. *Surg Technol Int* 2009;18:19-25
20. Ramirez PT. Single-port laparoscopic surgery: is a single incision the next frontier in minimally invasive gynecologic surgery? *Gynecol Oncol.* 2009;114(2):143-4
21. Fader AN, Escobar PF. Laparoendoscopic single-site surgery (LESS) in gynecologic oncology: technique and initial report. *Gynecol Oncol* 2009;114(2):157-61