VIDEO ARTICLE

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Laparoscopic management of caesarean scar pregnancy in 10 steps

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ABSTRACT

Background: Caesarean scar pregnancy (CSP) is a pathologic entity with rising incidence over recent years. So far, there are many treatment methods and protocols suggesting surgical or medical interventions and their combinations. More and more laparoscopic surgery is applied to treat scar pregnancy with excellent results. A proper surgical strategy is a key point for optimal surgical outcome.

Objectives: To present a standardised technique for the laparoscopic management of CSP.

Participant: Patients with CSP having the indication of laparoscopic treatment.

Intervention: The video presents a systematic approach of the laparoscopic treatment of CSP clearly divided into 10 steps: 1. Prepare the surgery; 2. Inspection of the pelvis; 3. Bladder dissection; 4. Preventive haemostasis; 5. Hysterotomy; 6. Evacuation of conception products; 7. Excision of niche scar tissue; 8. Evacuation of the uterine cavity; 9. Suturing of the uterine defect; 10. Removal of the uterine artery clips. The main outcome measures are the efficacy of the laparoscopic management of CSP and the postoperative uterine reconstruction in terms of ultrasonic measurement of the isthmic myometrial layer thickness. Patients are released from the hospital the day after the surgery, and a follow-up ultrasound is scheduled three months post-operatively. In the case presented in the video, the myometrial wall is increased from 3 mm preoperatively to 13 mm three months postoperatively.

Conclusions: The main advantage of this technique is the ability to treat CSP, remove the uterine isthmocele, and reconstruct the lower uterine segment simultaneously. The 10 steps proposed in a logical sequence may shorten the surgery's learning curve and reduce possible complications.

What is New? We present a systematic approach that provides a safe and easily reproducible technique for managing CSP.

Keywords: Caesarean scar pregnancy, ectopic pregnancy, laparoscopy, uterine niche

Introduction

Caesarean scar pregnancy (CSP), characterised by the implantation of the gestational sac into the isthmocele formed after a previous caesarean section, is increasingly being recognised, with its incidence estimated to reach up to 4% of all ectopic pregnancies.[1,2] Myometrial dehiscence and development of secondary fibrosis during the healing process predispose to implantation of the conceptus into the newly formed defect, defined as uterine niche.[3] Uterine rupture may be the result of pregnancy progression in untreated cases, leading to massive uterine bleeding.[4] Early diagnosis and prompt management are imperative to establish favourable outcomes in these patients.[5]

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Given the rarity of CSP, which challenges the ability to conduct reliable, high-quality studies, there is a lack of consensus on a standard treatment, although more than 30 medical and surgical protocols have been proposed so far.[6] Expectant management, methotrexate administration (local or systematic), uterine artery embolisation, high-intensity focused ultrasound, dilation and curettage, hysteroscopy, laparoscopy, and their combinations have all been proposed to detect the best treatment intervention.[7,8] Over the last decade, the laparoscopic approach has been reported more often to effectively treat CSP, claiming high success and minimal complication rates.[9] Moreover, uterine reconstruction and resection of the uterine niche reduce the recurrence of CSP. Laparoscopic management of CSP is a demanding operation requiring advanced surgical skills. We report a standardised approach, clearly divided into 10 steps, with an aim to make the procedure easily reproducible.

Methods

The video presents a systematic approach to the laparoscopic treatment of CSP, clearly divided into 10 steps: 1. Prepare the surgery; 2. Inspection of the pelvis; 3. Bladder dissection; 4. Preventive haemostasis; 5. Hysterotomy; 6. Evacuation of conception products; 7. Excision of niche scar tissue; 8. Evacuation of the uterine cavity; 9. Suturing of the uterine defect; 10. Removal of the uterine artery clips. Patients included in the video are women with indications for laparoscopic management of CSP. All patients have given written consent for publication of the video and participation in this study.

When preparing for the surgery, an ultrasound scan by a sonographer specialised in gynaecological pathology is mandatory to establish the correct diagnosis. It is important to measure the residual myometrial thickness of the uterine isthmocele accurately. Thorough counselling for the patient regarding the benefits and complications of each management option helps in agreeing the therapeutic plan. During the pelvic inspection, an assessment of the ectopic pregnancy is performed, mainly focused on ectopic size, bulging, and blood supply while identifying the main anatomic landmarks. Vesico-uterine dissection starts by dividing the peritoneum from one round ligament to the other. In many cases, this step may be challenging for the surgeon as, due to previous c-sections, the bladder is firmly adherent to the uterus (Figure 1). A few measures of preventive haemostasis may be applied to control bleeding. Temporary uterine artery clipping and intra-myometrial diluted Vasopressin (0,16 IU/mL) are two effective interventions to reduce myometrial bleeding.[10] After hysterotomy, the evacuation of conception products follows to remove all trophoblastic remnants, trying not to lacerate the adjacent endometrium (Figure 2). The scar tissue of the isthmocele is then excised to prepare the uterine isthmus for reconstruction, and a suction curettage may be applied to remove all trophoblastic tissue adjacent to the uterine fundus. The uterine defect is closed using interrupted or running sutures (Figure 3).

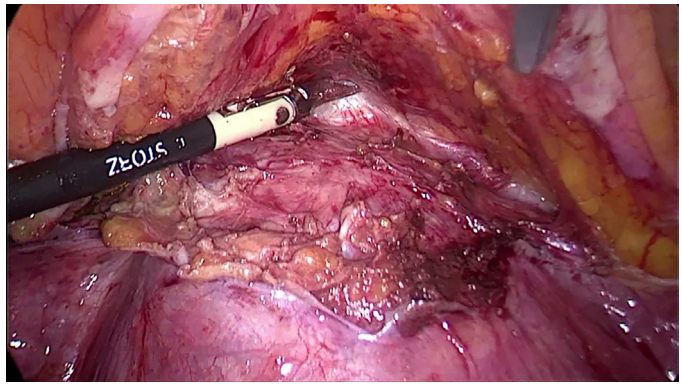

Figure 1. Bladder dissection up to the cervix.

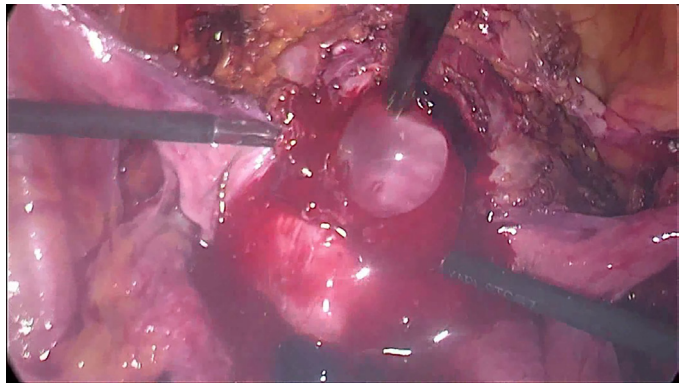

Figure 2. Extraction of the conception products from the uterus.

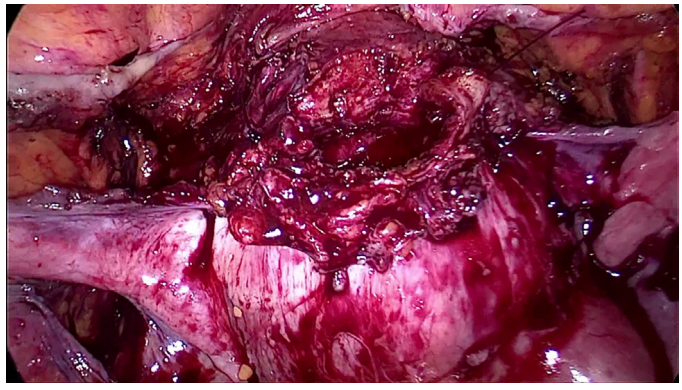

Figure 3. Suturing of the uterine defect to reconstruct the uterus after isthmocele removal.

We propose two-layer sutures to increase postoperative myometrial thickness. Finally, the clips of the temporary uterine artery clipping are removed.

Results

The technique described aims to reduce intraoperative blood loss, treat CSP and reconstruct the lower uterine segment with a low complication rate. Patients are discharged from the hospital the day after the surgery, and a follow-up ultrasound is scheduled three months postoperatively. Ultrasonic evaluation primarily focuses on the thickness of the myometrial wall where the isthmocele was located prior to surgery. In the case presented in the video, the myometrial wall thickness increased from 3 mm preoperatively to 13 mm postoperatively, showing that laparoscopy is an appropriate approach with excellent myometrial thickness restoration without residual isthmocele.

Discussion

In this video article, we propose a 10 step laparoscopic treatment of CSP. The steps are divided and presented clearly, leading to a more standardised approach for experienced surgeons to take. The systematic approach of gynaecologic surgery in 10 steps has already been described for other indications such as myomectomy, lymph node dissection, ovarian cyst excision or sclerotherapy, and promontofixation.[11-14] The 10 steps help to perform each part of the surgery in a logical sequence, contributing to increasing the procedure's ergonomics and making it easier to adopt and learn.[15] Another goal of the teaching video is to help surgeons to shorten the learning curve of the operation performed.

Besides the standardised surgical steps, our video highlights some important surgical techniques for facilitating the operation. Bladder dissection is, in our opinion, the most difficult step of the surgery due to a previous caesarean section. During this dissection, the surgeon has to take care to follow the avascular plane and avoid the enlarged neovasculature that commonly accompanies the CSP. If the surgical plane is lost, the surgeon may instil normalsaline in the bladder to help recognise the plane and facilitate dissection. Moreover, it is helpful to spend some surgical time to temporarily ligate the uterine artery, an intervention that, in our experience, reduces intraoperative blood loss during hysterotomy, which follows afterwards. Finally, suturing of the uterine defect after niche removal is imperative to increase the postoperative myometrial thickness, predisposing to reduced recurrence of isthmocele and future CSP. We propose two layers of interrupted sutures, but the suturing strategy is up to the surgeon's preference, as there is no evidence supporting any specific suturing technique. However, other suturing techniques could be applied depending on the surgeon's preference. The first and second sutures are placed in the left and right corners and are used as guide sutures.

The strength of our technique lies in its ability to present 10 clearly divided surgical steps that are easy to follow. Moreover, it may simultaneously address both CSP and uterine isthmocele, which is very important, especially in women who desire future fertility. Uterine niche is a pathology well-known for its negative impact on future fertility, as the blood accumulated in the uterine cavity may be embryotoxic, alter the cervical mucus, and reduce uterine receptivity either mechanically or through disturbance of cytokine cascades.[16]

Conclusion

The systematic approach provides a safe and easily reproducible technique for managing CSP. Moreover, the main advantage is the ability to treat CSP, remove the uterine isthmocele, and reconstruct the lower uterine segment simultaneously. The 10 steps proposed in a logical sequence may shorten the surgeon's learning curve and aim to lower the complication rate.

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Transparency: The authors affirm that the manuscript is an honest, accurate, and transparent account of the studies assessed.

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Video 1. Laparoscopic management of caesarean scar pregnancy in 10 steps.

https://youtu.be/gOn-PNmLL_M