

Cesarean scar defect , an overview of diagnosis and treatment

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Questions

- 1. What is the Niche?**
- 2. Why do niches develop in Caesarean uterine scars?**
- 3. What are the symptoms and signs?**
- 4. How can we diagnose Niche?**
- 5. What is the best treatment option for Niche?**

What is the Niche?

The term 'niche' describes the presence of a hypoechoic area within the myometrium of the lower uterine segment, reflecting a discontinuation of the myometrium at the site of a previous CS.

Monteagudo A, Carreno C, Timor-Tritsch IE. Saline infusion sonohysterography in nonpregnant women with previous cesarean delivery: the 'niche' in the scar. *J Ultrasound Med* 2001;20:1105–1115.

Bij de Vaate AJ, van der Voet LF, Naji O, Witmer M, Veersema S, Brolmann HA, Bourne T, Huirne JA. Prevalence, potential risk factors for development and symptoms related to the presence of uterine niches following Cesarean section: systematic review. *Ultrasound Obstet Gynecol* 2014;43:372–382.

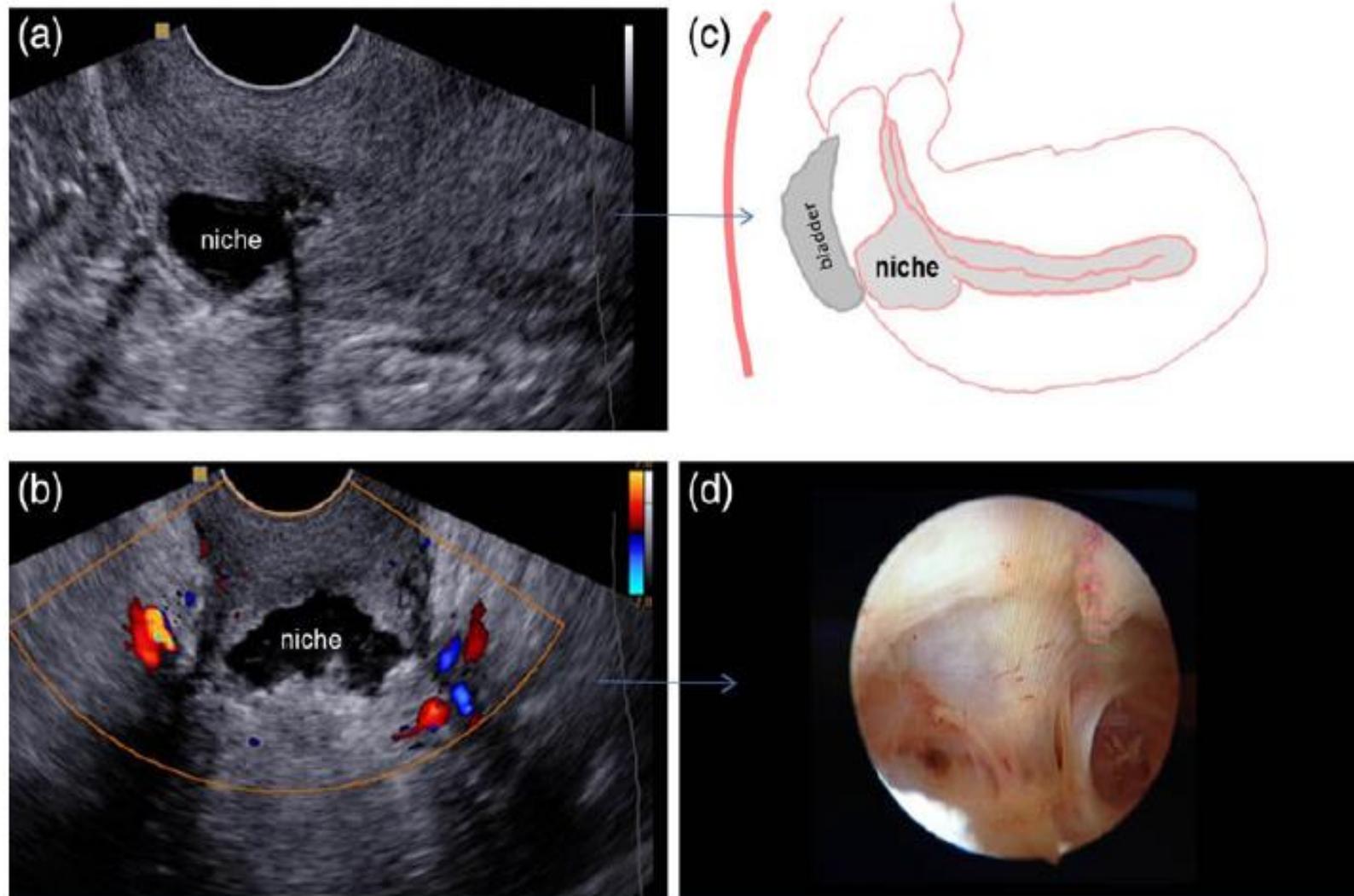


Figure 1 Image of a niche using transvaginal ultrasound in mid-sagittal and transversal plane and a schematic diagram of a niche and hysteroscopic image. (a) Mid-sagittal plane; (b) transversal plane; (c) schematic diagram of a niche; (d) niche seen by hysteroscopy, the internal os is out of the scope of this picture.

Why do niches develop in Caesarean uterine scars? Hypotheses on the aetiology of niche development

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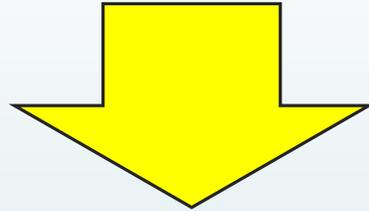
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Why do niches develop in Caesarean uterine scars?

► Hypotheses 1



1. Cervical location of the uterine incision induces impaired wound healing

► mucus-producing glands, hampers wound healing.

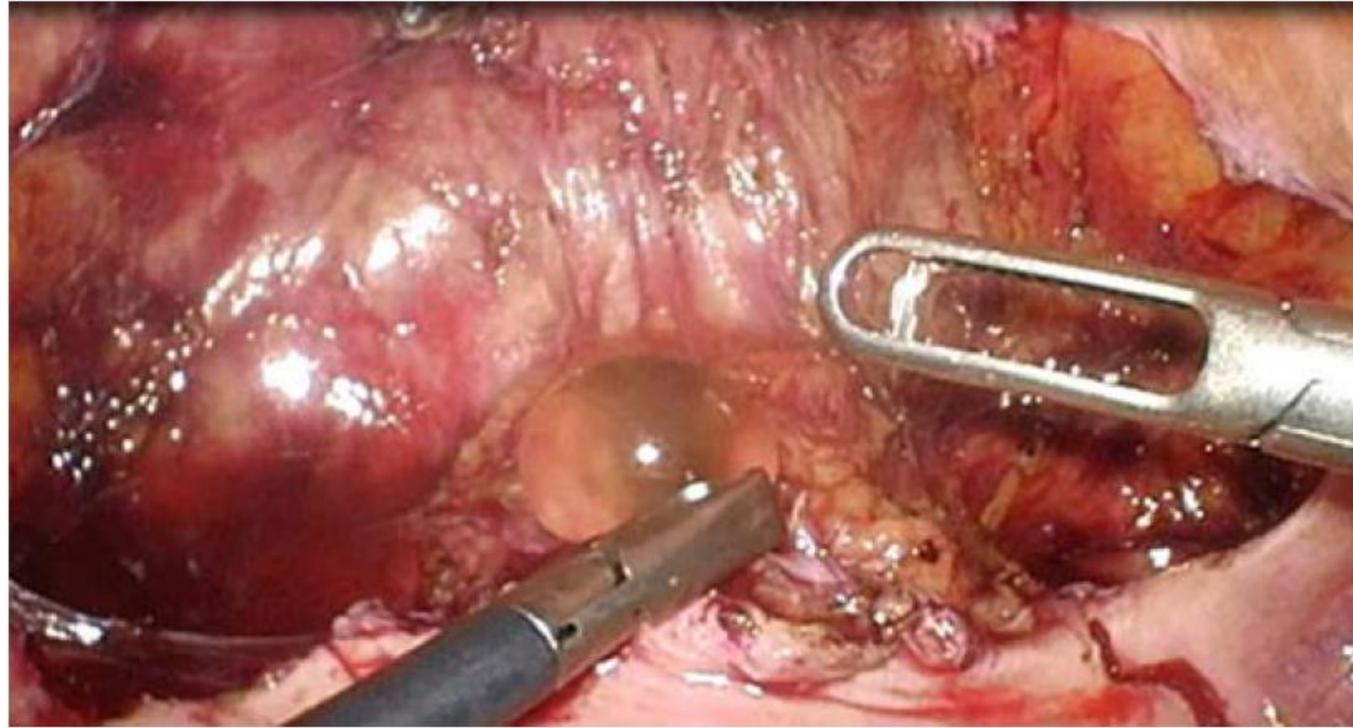


Figure 2 Laparoscopic view on a mucus-containing large niche that is located in the lower cervix. Mucus is expelled during a laparoscopic niche resection after dissection of the bladder and opening of the niche.

Hypothesis2

2: Incomplete closure of the uterine wall

Two randomized trials were published on short-term outcomes after different surgical techniques for CS: the CAESAR and CORONIS trials (CORONIS trial, 2007; CAESAR trial, 2010).

CORONIS trial, 2007; CAESAR trial, 2010

These trials evaluated different surgical interventions in .3000 patients (CAESAR) and .15 000 patients (CORONIS).

1. Single- versus double-layer closure of the uterine layer
2. Closure versus non-closure of the peritoneum (pelvic and parietal)
3. Liberal versus restricted use of a sub rectus sheath drain
4. Blunt versus sharp abdominal entry
5. Exteriorization of the uterus for repair versus intra-abdominal repair

No significant differences between any of the interventions studied were found in maternal or fetal outcomes during the first 6 weeks.



Double-layer uterine closure using non-locking sutures may result in a thicker residual myometrium and potentially a lower prevalence of niches.

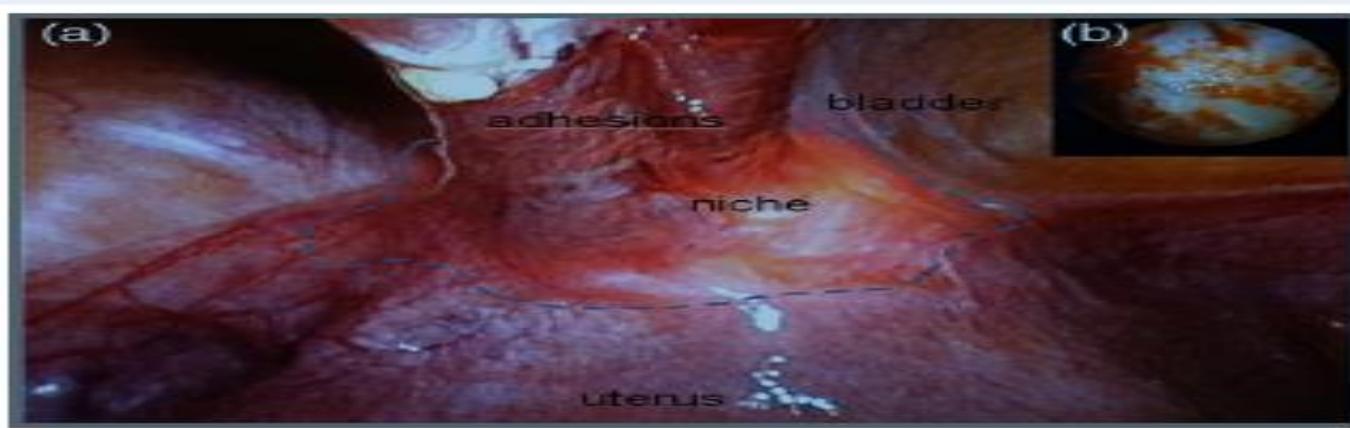


Figure 4 Laparoscopic image of a uterus with a large niche, illumination of the hysteroscopic light in the niche can be seen directly under the adhesions attached to the niche. Adhesions between the niche and the abdominal wall seen during laparoscopy (a), owing to the diaphany of the combined hysteroscopy it can be seen that the adhesions are located at the deepest point of the niche. Hysteroscopic image of the combined of a part of the large niche surface be seen in (b).

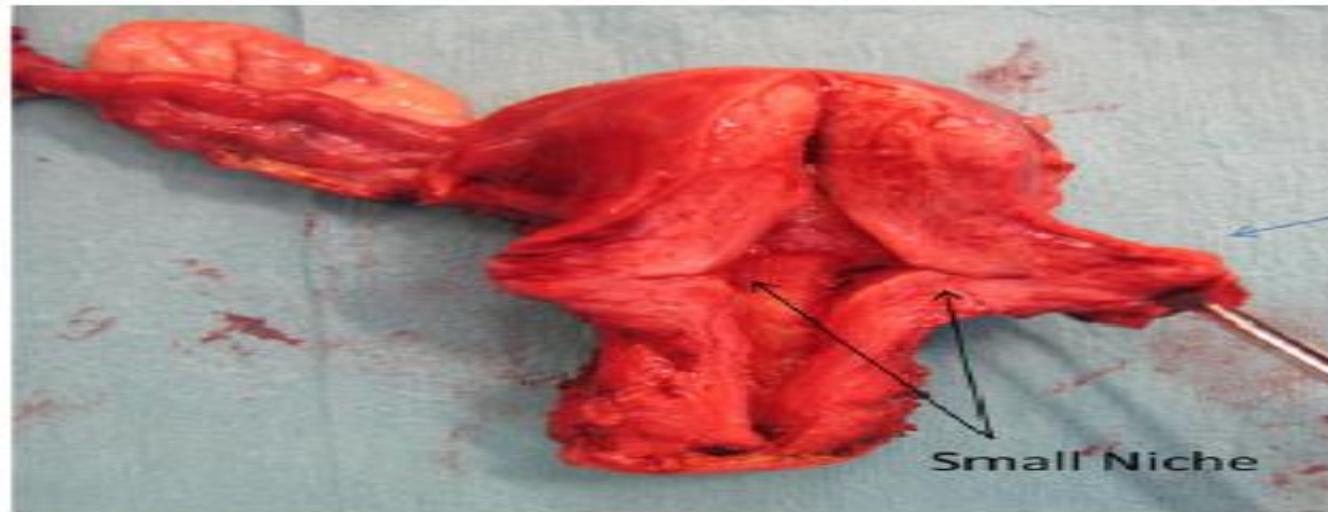


Figure 5 Macroscopic image of a uterus with a niche, removed by laparoscopy because of abnormal uterine bleeding and dysmenorrhoea. Note that the adhesions are located at the deepest point of (a relatively small) niche.

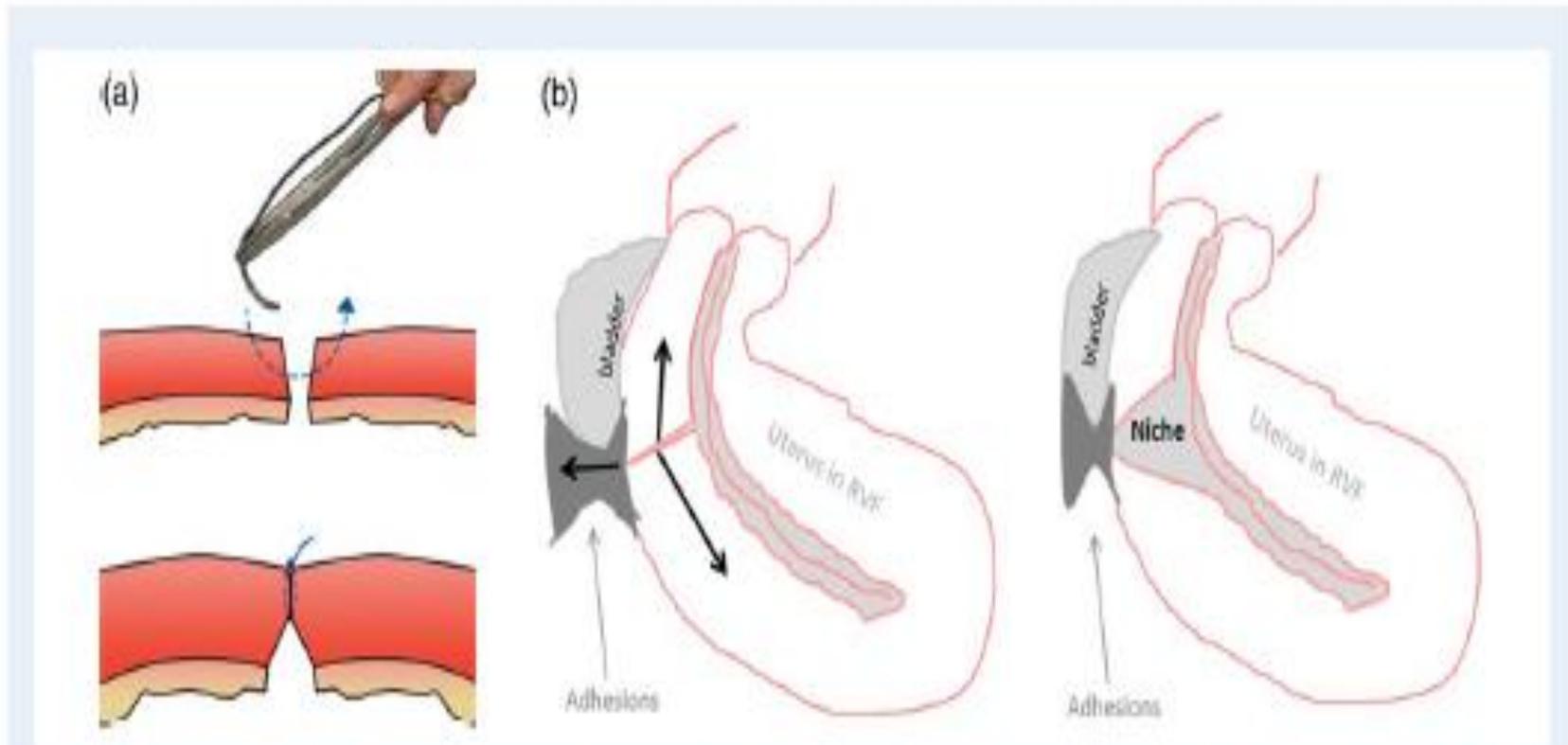


Figure 3 Schematic diagram of incomplete closure of the myometrium and counteracting forces on the uterine scar due to the retraction of adhesions between the scar and the abdominal wall in a retroflected uterus. (a) Single-layer closure of the uterus may increase niche formation due to greater risk of incomplete closure. (b) Counteracting forces on the Caesarean section uterine scar, due to retraction of adhesions between the uterine scar and the abdominal wall in a retroflected uterus, may impair wound healing and increase the formation of niches.

Hypothesis3

Surgical activities → adhesion → impaired wound healing due to counteracting forces on the uterine scar.

Hypothesis4

Individual differences in wound healing exist.

BMI?

preeclampsia?

hypertension ?

Osser OV, Jokubkiene L, Valentin L. High prevalence of defects in Cesarean section scars at transvaginal ultrasound examination. *Ultrasound Obstet Gynecol* 2009;34:90–97.

Table 1 Overview of hypotheses on the intermediate role of the niche on fertility outcomes.

Hypothesis

Detrimental environment for sperm penetration and implantation

1. Niche-related accumulation of intrauterine fluid impairing implantation
2. Altered immunobiology and/or increased inflammation when a niche is present
3. Distorted contractility of the uterus caused by fibrosis or interruption of the myometrial layer at the site of the niche
4. Accumulation of mucus and old blood in the niche, which may impair sperm penetration

Physical barrier for embryo transfer and implantation

5. A large niche in combination with a strongly retroflexed uterus impairs accessibility for an eventual embryo transfer due to a distorted anatomy

Psychogenic causes that reduce the likelihood of pregnancy

6. Niche-related gynaecological symptoms may interfere with sexual intercourse, and focused therapies for niche complaints may interfere with opportunities to conceive during the convalescence period



Novel laparoscopic surgery for the repair of cesarean scar defect without processing scar resection

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Abstract

Background: Cesarean scar defect (CSD), especially CSD with residual myometrium less than 3 mm is reported to be the highest risk agent associated with uterine rupture for subsequent pregnancy. Currently, laparoscopic resection and suture was the mainstay therapy method for CSD with a residual myometrium less than 3 mm in women with a desire to conceive. Besides, the women have CSD related symptoms, especially postmenstrual bleeding, should be recommended for CSD treatment. This study is to investigate the efficiency of this novel laparoscopic surgery for the repair of cesarean scar defect (CSD) without scar resection for residual myometrium thickening.

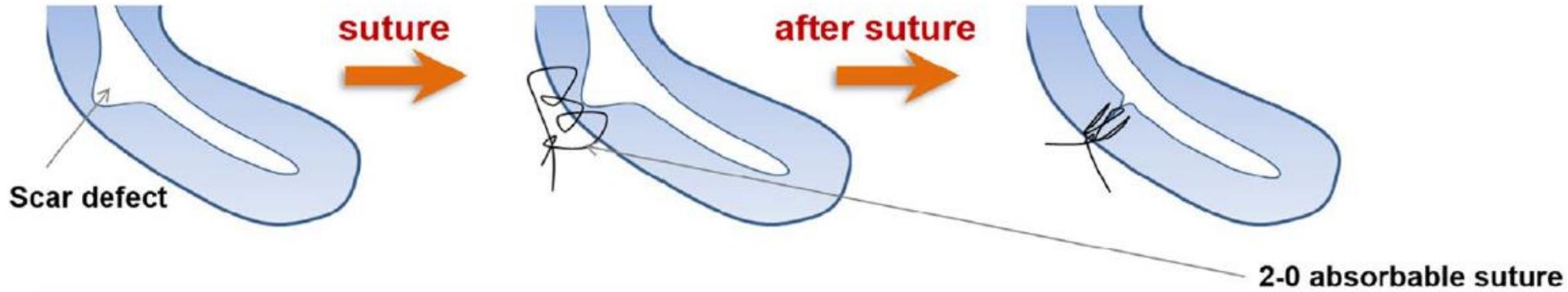
Method: This retrospective clinical study enrolled 76 women diagnosed with CSD who had a residual myometrium thickness less than 3 mm and also had a desire to conceive, had undergone laparoscopic surgery for the repair of CSD in the time period March 2016 to March 2018. Two study cohorts were created among the 76 patients: 40 patients had undergone the novel laparoscopic repair of CSD without processing scar resection (Group A), whereas 36 patients had undergone the traditional laparoscopic resection and suture of CSD (Group B).

Results: Residual myometrium thickening occurred among all the 76 patients and the average residual myometrium thickness was increased to almost 6 mm, presenting no between-group difference. In Group A, all the CSD-related postmenstrual bleeding was resolved or improved, but one patient in Group B has no obvious change to postmenstrual bleeding. After CSD repair, 20 patients got pregnant naturally in Group A, and there was no cesarean scar pregnancy and uterine rupture. While, there were 9 cases of natural pregnancy in Group B. No uterine rupture occurred among these 9 pregnant women of Group B, but 1 case of pregnancy was terminated due to cesarean scar pregnancy.

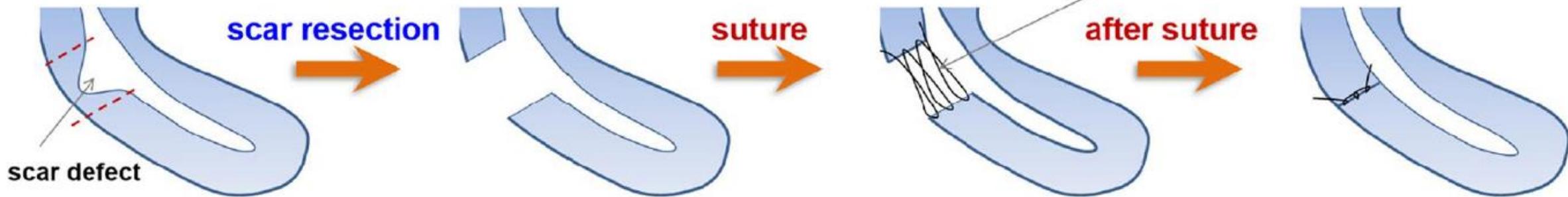
Conclusion: Laparoscopic repair without processing scar resection seems to be a feasible, safe and simple operative approach for CSD treatment, which can thicken residual myometrium and improve postmenstrual bleeding.

Keywords: Cesarean section, Laparoscopy, Cesarean scar defect, Minimally surgical treatment

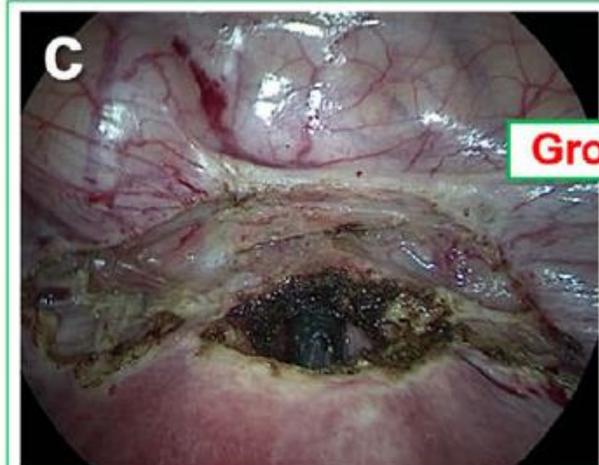
a Group A: laparoscopic repair of CSD without processing scar resection



Group B: laparoscopic repair of CSD with processing scar resection



Group A



Group B

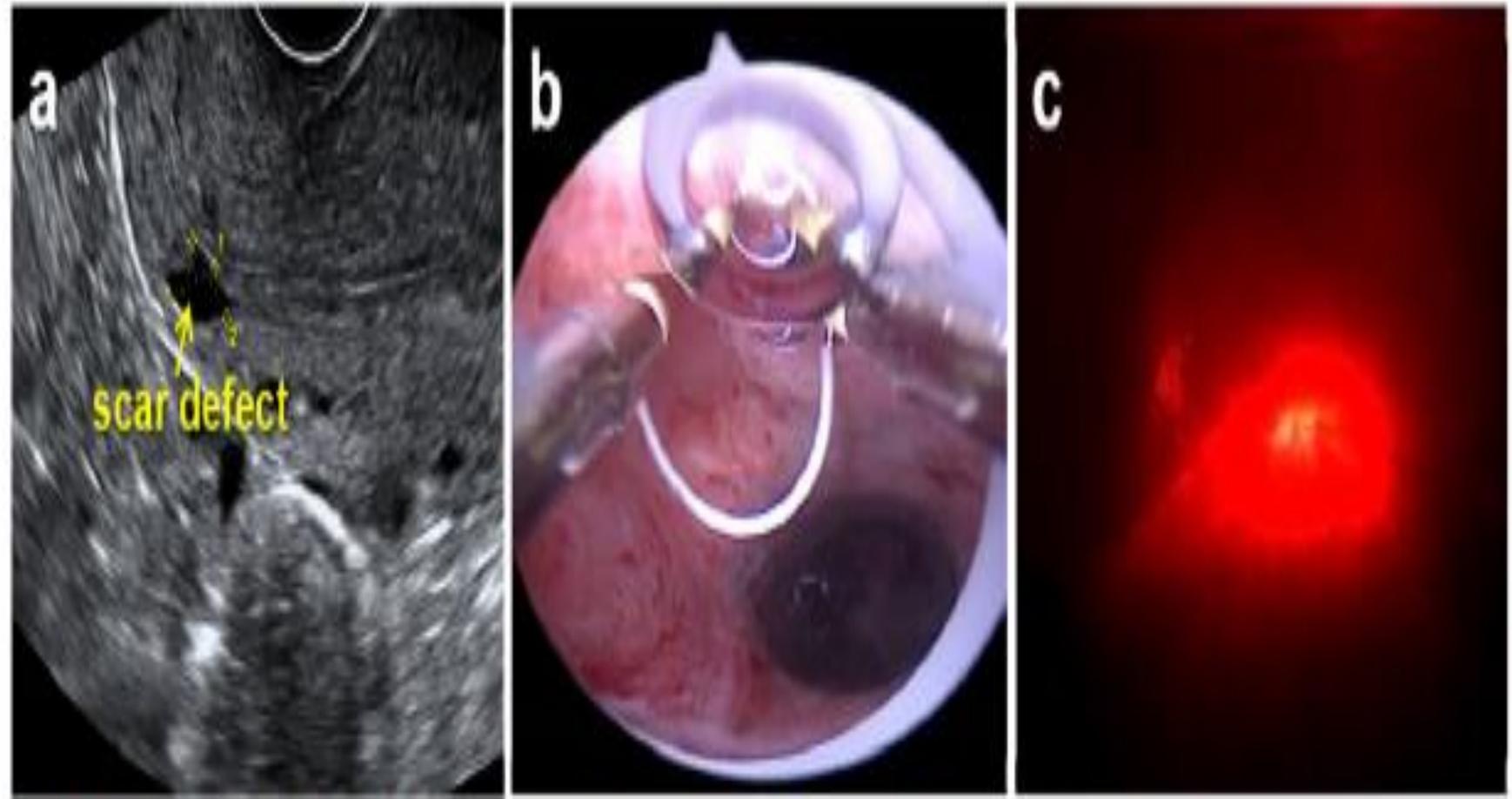


Fig. 1 CSD examination and confirmation: **a** transvaginal ultrasound image; **b** hysteroscopic examination; **c** light test

Hysteroscopic and laparoscopic management of caesarean scar (niche) in symptomatic patients

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ABSTRACT

Introduction: Worldwide, rates of caesarean section are rising. The term 'niche' describes the presence of an hypoechoic area within the myometrium of the lower uterine segment, reflecting a discontinuation of the myometrium at the site of a previous caesarean section. A defect in caesarean section scar is associated with symptoms like abnormal uterine bleeding, infertility and complications in subsequent pregnancy including: risk of rupture and morbidly adherent placenta. It can also increase rates of complications during gynaecological procedures: IUCD insertion, evacuation of retained products of conception, hysteroscopy and risk of ectopic pregnancy at scar site.

Aims: To assess the use of surgical techniques to repair niche defects in symptomatic patients, with regards to operative complications, symptomatic relief, postop lower segment thickness and fertility.

Methods: Patients were identified between August 2015–March 2017. Inclusion criteria: Patients who had one previous caesarean section, symptomatic i.e. abnormal uterine bleeding, dysmenorrhoea, dyspareunia, infertility. Exclusion criteria: Asymptomatic patients. No previous caesarean section.

Results: Between August 2015 and March 2017, six patients underwent surgical management of niche defect. Four patients reported post menstrual bleeding, one patient had infertility and one had intermenstrual bleeding and dyspareunia. All patients had one caesarean section previously. Mean lower segment measurement preoperatively was $2.5 \text{ mm} \pm 1.6 \text{ mm}$. EBL intraoperatively was 130 ml (10–180 ml). Mean operating time was 90 mins (70–150 min). One patient was pregnant after niche repair and delivered by CS at 38 w. In all six cases, TVS in 3–5 months after surgery revealed restored lower segment to normal thickness $9.2 \text{ mm} \pm 1.8 \text{ mm}$. Symptom resolution was noted in all patients. There were no operative complications.

Conclusions: Anterior uterine wall should be explored in the case of symptomatic patients with previous caesarean section scar. Hysteroscopic resection should not be proposed when RMT is $<3 \text{ mm}$. Laparoscopic/vaginal repair allows restoration of the anatomy of the lower uterine segment when residual myometrium is $<3 \text{ mm}$. Laparoscopic repair allows antefixation in cases of retroverted uterus. Consideration of a surgical approach should be determined by the patient's plans for fertility and by niche thickness. For women who do not desire pregnancy and whose niche thickness is $>3 \text{ mm}$, a hysteroscopic approach should be considered. Women with symptomatic caesarean scar defects who do not desire fertility may also be candidates for hysterectomy. Patients who desire future fertility, especially those with $<3 \text{ mm}$ of myometrium at the niche site, should undergo laparoscopic resection.



THANK YOU