

Should Laparoscopy be the Gold Standard for Isthmocele?

Roshan Zeirideen Zaid

ABSTRACT

Isthmocele is born due to the overwhelmingly increasing cesarean section (CS) rates all over the world. It was an unknown entity in the last century. Cesarean sections are and can be responsible for short- and long-term maternal and fetal morbidity, mortality, and financial issues, directly and indirectly associated to the former. Out of the many problems that are caused by CS, isthmocele is a growing surgical concern that needs attention in identifying, diagnosing, managing, and treating this problem. Currently, treatments include medical and surgical approaches. Hysteroscopy as well as laparoscopy are used in the treatment. This review was carried out to show that laparoscopy is superior in treating an isthmocele than all other treatment modalities.

Materials and methods: An electronic search was done and various articles and studies were reviewed to support the hypothesis.

Keywords: Cesarean section, Hysteroscopy, Isthmocele, Niche, Postmenstrual bleeding, Scar defect.

How to cite this article: Zaid RZ. Should Laparoscopy be the Gold Standard for Isthmocele? *World J Lap Surg* 2016; 9(3):118-121.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Cesarean section (CS) was always believed to be a lifesaving operation for the mother and the unborn. But ironically, its rates are rising in the midst of highly improving medical advances in maternal and newborn care. Forbes magazine¹ has recently published that in the Organisation for Economic Co-operation and Development (OECD) countries, the CS rate approximately stands at 28%. This includes 34 countries around the world. Further, the World health organization (WHO) Global Survey indicates that overall CS rates have increased over time in all countries except Japan from 26.4 to 31.2% in a multicountry survey ($p = 0.003$).²

Board-Certified (UK) Resident Consultant

Department of Obstetrician and Gynaecologist, Nawaloka Hospitals PLC, Colombo, Sri Lanka

Corresponding Author: Roshan Zeirideen Zaid, Board Certified (UK) Resident Consultant, Department of Obstetrician and Gynaecologist, Nawaloka Hospitals PLC, Colombo, Sri Lanka e-mail: roshanzeirideen@yahoo.com

The ripple effect of the rising CS rates are being seen in many ways. Apart from the well-known placental complications and others following CS, the rising concerns have turned toward the potential long-term morbidity of the scar. Isthmocele is an iatrogenic entity created in the last few decades due to the worldwide increase in CS rates. Isthmocele aka CS scar defect (CSD), CS scar abnormality, pouch, niche, atypical cesarean scar syndrome or cesarean scar syndrome, uterine diverticulum, uteroperitoneal fistula is a result of weak or incompletely healed scar.³⁻⁷

Isthmocele is believed to cause symptoms like postmenstrual spotting, discharge, smelly postmenstrual bleeding, chronic pelvic pain, and dyspareunia,⁸ and lately, there has been evidence that this could be related to secondary subfertility.⁹ Apart from the above, other problems associated with scar defect are high-risk complications with subsequent pregnancies,¹⁰ such as dehiscence, placenta previa or accrete,¹¹ and cesarean scar ectopic pregnancy,¹² and difficulty with gynecological procedures like uterine evacuation, hysteroscopy, and intrauterine-device insertion.¹³

Thurmond postulated in 1999 that a niche in the cesarean scar could be the cause of abnormal bleeding due to the collection of menstrual blood in the pouch.¹⁴ In 1961 it was first described as a wedge in HSG (hysterosalpingogram) by Poidevin.¹⁵ Also Morris¹⁶ had similar findings while analyzing uterine specimens of women who underwent hysterectomies. U- or V-shaped hypoechoic or anechoic fluid accumulation in the region of former uterotomy was considered as diagnostic¹⁷ with the above-described symptoms.

The incidence of ismocele varies so much from as low as 24% to as high as 84%. Prospective cohort studies done by Florio state the prevalence as 30 to 52%.^{9,18,19} Van der voet et al.²⁰ found the prevalence to be 64.5% 6 to 12 weeks after CS in women using transvaginal ultrasound and sonohysterography. All studies agree that all women who have the scar defect are not symptomatic. Tower and Frishman²¹ found the prevalence of symptomatic CSD could be as low as 19.4% to as high as 88%.

Theories/Risk Factors Contributing to the Formation of the Defect

The exact reason is unknown, but there are many hypotheses regarding the contributing factors. The niche is typi-

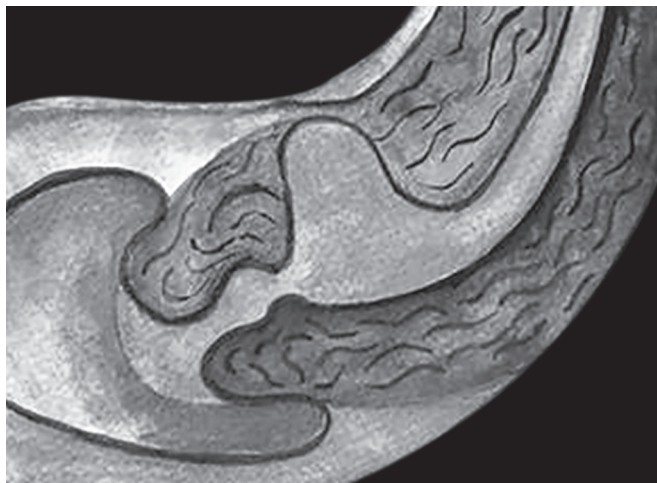


Fig. 1: Cesarean scar defect

cally found on the anterior surface of the uterus on the hysterotomy scar. Thinning of the myometrium creates a pouch (Fig. 1).⁷

Patient Related Factors

- Multiple Cesarean deliveries
- Factors impacting wound healing
- Factors that possibly hamper normal wound healing and related angiogenesis,⁸ retroflexed uterus,¹⁸
- Labour before CS.^{21,22}

Surgery Related

- Single-layer uterine wall closure (incomplete/disrupted closure of myometrium),
- Use of locking sutures, closure of hysterotomy with endometrial-sparing technique.⁷
- Low location (cervix) of uterine scar at the time of CS,
- Surgical activities that may induce adhesion formation (i.e., non closure of peritoneum, inadequate hemostasis, applied sutures, use of adhesion barriers).⁸

This abnormality can be visualized on transvaginal ultrasound, saline-infused sonohysterography (SIS), and hysterosalpingography (HSG).⁹ It is seen as a hypoechoic area as a discontinuation of the myometrium. An magnetic resonance imaging (MRI) should be used to confirm the position and defect size prior to attempting to repair the defect.²³ Hysteroscopy is also a useful modality to assess the defect.²⁴

Treatment Options

All theories point to a thin disrupted layer of myometrium surrounding the niche. Possibilities of the niche been covered by polypoidal endometrium, congested endometrium/new blood vessels,^{8,16} and hyalinized myometrium⁶ are being described in histological specimens.

On this basis, treatment should be aimed to relieve the symptoms and strengthen the wall of the myometrium again to prevent potential complications, that is, surgical reconstruction of the uterotomy scar.¹⁷

Medical and hormonal (combined contraceptive pills and intra uterine device (IUD)) have not shown any improvement in quality of life. Hysteroscopy and treatment appear to remove the symptoms. Also some studies have suggested hysterectomies for postmenstrual bleeding. Laparoscopy has been used on its own or in conjunction with hysteroscopy in surgically correcting this defect. Very few cases of vaginal revision and endometrial ablations have also been mentioned.

Saline infusion sonohysterography (SIS lavage) was described by Ida et al²⁵ in successfully healing the defect spontaneously in a single case report.

DISCUSSION

The niche is still an unknown or a new entity for many. There is no clear definition for a CSD; neither is it a common terminology. Hence, the prevalence of the condition has huge variations. Some have a vague definition ie a U-, V-, or triangular-shaped anechoic or hypoechoic fluid collection¹⁷ seen on scan or SIS²¹ is simply considered as a niche. No standardized definition is found in the literature. Hence, comparing studies is challenging.

Possible Mechanism

The collected blood from the niche present as postmenstrual bleeding problems. The flow of menstrual blood through the cervix may be slowed by the presence of isthmocele, as the blood may accumulate in the niche because of the presence of fibrotic tissue, causing pelvic pain in the suprapubic area. Moreover, persistence of the menstrual blood after menstruation in the cervix may negatively influence the mucus quality and sperm quality, obstruct sperm transport through the cervical canal, and interfere with embryo implantation, leading to secondary infertility.⁹

Hysteroscopy is the most commonly reported approach in the literature. Other methods include mostly laparoscopy in combination with hysteroscopy or on its own. Few suggest vaginal, medical (hormonal, IUD),^{26,27} and SIS lavage). In spite of hysteroscopy being the famous method, it has its own pitfalls. Resectoscope is less invasive and can be used to correct the defect,⁹ but the hysteroscopic approach is not possible in all cases, and also it is good only in correcting the defect, not strengthening the myometrium or correcting the disruption and reinforcing the endurance. Potential scar rupture or dehiscence is not corrected in hysteroscopic approach.^{28,29}

In the hysteroscopy procedure, the surface is coagulated, distal rim resected,^{24,30,31} or polyps removed.⁸ The randomized controlled trial (RCT) by Vevroot compared hysteroscopy with other methods in the control group (Combined oral contraceptive pills (COC), Intrauterine device (IUD), and hysterectomy). They concluded that this is not good for defects that are too thin (less than 3 mm) since the bladder injury/perforation is too high; also this cannot be used for niches more than 5 mm. They found that quality of life and sex life improved following the procedure; they have not looked into the fertility outcome. Also hysteroscope has the capacity to only coagulate the superficial vessels, not the deep ones, so possibility of recurrence or converting to open or laparoscopy surgery is always there if the bleeding becomes heavy. Prospective and retrospective studies done by Gubbins et al³², Fabres et al^{24,33} and many others state possible improvement of fertility. All studies that show improvement in fertility following hysteroscopic treatment have a very small sample size.

CONCLUSION

A common terminology and definition is needed for this defect in the myometrium following hysterotomy. We need more RCT in order to assess the best treatment options. As opposed to hysteroscopy, in laparoscopy the defect explored, fibrous tissue excised, and the defect in the myometrium is closed, hence functional and anatomical aspects of the niche are restored.²³ Symptoms vanish, fertility restored, and the potential future problems negated. Hence, with the available current evidence, laparoscopy is the way forward to correct the niche.

REFERENCES

1. The Forbes. Which countries have the highest caesarean section rates? 2016 Jan.
2. Roberts CL, Nippita TA. International caesarean section rates: The rising tide. *Lancet* 2015 May;3(5):241-242.
3. Clark EA, Silver RM. Long-term maternal morbidity associated with repeat caesarean delivery. *Am J Obstet Gynecol* 2011 Dec;205(6 Suppl):S2-S10.
4. Silver RM. Delivery after previous caesarean: Long-term maternal outcomes. *Semin Perinatol* 2010 Aug;34(4):258-266.
5. Monteagudo A, Carreno C, Timor-Tritsch IE. Saline infusion sonohysterography in nonpregnant women with previous caesarean delivery: The "niche" in the scar. *J Ultrasound Med* 2001 Oct;20(10):1105-1115.
6. Masuda H, Uchida H, Maruyama T, Sato K, Sato S, Tanaka M. Successful treatment of atypical caesarean scar defect using endoscopic surgery. *BMC Pregnancy Childbirth* 2015;15:342.
7. Nezhat C, Grace L, Soliemannjad R, Razavi GM, Nezhat A. Caesarean scar defect: What is it and how should it be treated? *OBG Manage* 2016 April;28(4):32.
8. Vervoort AJ, Uittenbogaard LB, Hehenkamp WJK, Brölmann HAM, Mol BWJ, Huirne JAF. Why do niches develop in Caesarean uterine scars? Hypotheses on the aetiology of niche development. *Hum Reprod* 2015 Dec;30(12):2695-2702.
9. Florio P, Filippeschi M, Moncinia I, Marrac E, Franchinid M, Gubbini G. Hysteroscopic treatment of the caesarean-induced isthmocele in restoring infertility. *Curr Opin Obstet Gynecol* 2012 Mar;24(3):180-186.
10. Chazotte C, Cohen WR. Catastrophic complications of previous caesarean section. *Am J Obstet Gynecol* 1990 Sep;163(3):738-742.
11. Clark SL, Koonings PP, Phelan JP. Placenta previa/accreta and prior caesarean section. *Obstet Gynecol* 1985 Jul;66(1):89-92.
12. OuYang Z, Yin Q, Xu Y, Ma Y, Zhang Q, Yu Y. Heterotopic caesarean scar pregnancy: Diagnosis, treatment, and prognosis. *J Ultrasound Med* 2014 Sep;33(9):1533-1537.
13. Perez-Medina T, Sancho-Sauco J, Rios M, Pereira A, Argila N, Cabezas E, Cayuela E. Hysteroscopy in pregnancy-related conditions: Descriptive analysis in 273 patients. *J Minim Invasive Gynecol* 2014 May-Jun;21(3):417-425.
14. Thurmond AS, Harvey WJ, Smith SA. Caesarean section scar as a cause of abnormal vaginal bleeding: Diagnosis by sonohysterography. *J Ultrasound Med* 1999 Jan;18(1):13-16.
15. Poidevin LO. The value of hystero-graphy in the prediction of caesarean section wound defects. *Am J Obstet Gynecol* 1961 Jan;81:67-71.
16. Morris H. Surgical pathology of the lower uterine segment caesarean section scar: Is the scar a source of clinical symptoms? *Int J Gynecol Pathol* 1995 Jan;14(1):16-20.
17. Schepker N, Garcia-Rocha GJ, von Versen-Höyneck F, Hillemanns P, Schippert C. Clinical diagnosis and therapy of uterine scar defects after caesarean section in non-pregnant women. *Arch Gynecol Obstet* 2015 Jun;291(6):1417-1423.
18. Wang CB, Chiu WW, Lee CY, Sun YL, Lin YH, Tseng CJ. Caesarean scar defect: Correlation between caesarean section number, defect size, clinical symptoms and uterine position. *Ultrasound Obstet Gynecol* 2009 Jul;34(1):85-89.
19. Regnard C, Nosbusch M, Fellemans C, Benali N, van Ryselberghe M, Barlow P, Rozenberg S. Caesarean section scar evaluation by saline contrast sonohysterography. *Ultrasound Obstet Gynecol* 2004 Mar;23(3):289-292.
20. van der Voet LF, Bij de Vaate AM, Veersema S, Brölmann HA, Huirne JA. Long-term complications of caesarean section. The niche in the scar: A prospective cohort study on niche prevalence and its relation to abnormal uterine bleeding. *BJOG* 2014 Jan;121(2):236-244.
21. Tower AM, Frishman GN. Caesarean scar defects: An under-recognized cause of abnormal uterine bleeding and other gynecologic complications. *JMIG* 2013 Sep-Oct;20(5):562-572.
22. Osser Vikhareva O, Valentin L. Risk factors for incomplete healing of the uterine incision after caesarean section. *BJOG* 2010 Aug;117(9):1119-1126.
23. Marotta M-L, Donnez J, Squifflet J, Jadoul P, Darii N, Donnez O. Laparoscopic repair of post-caesarean section uterine scar defects diagnosed in nonpregnant women. *J Minim Invasive Gynecol* 2013 Jan;20(3):386-391.
24. Fabres C, Aviles G, De La Jara C, Escalona J, Muñoz JF, Mackenna A, Fernández C, Zegers-Hochschild F, Fernández E. The caesarean delivery scar pouch: Clinical implications and diagnostic correlation between transvaginal sonography and hysteroscopy. *J Ultrasound Med* 2003 Jul;22(7):695-700.
25. Ida A, Kubota Y, Nosaka M, Ito K, Kato H, Tsuji Y. Successful management of a caesarean scar defect with dehiscence of the

- uterine incision by using wound lavage. *Case Rep Obstet Gynecol* 2014;2014:Article ID 421014. 4 pages.
26. Florio P, Gubbini G, Marra E, Dores D, Nascetti D, Bruni L, Battista R, Moncini I, Filippeschi M, Petraglia F. A retrospective case – Control study comparing hysteroscopic resection versus hormonal modulation in treating menstrual disorders due to isthmocele. *Gynecol Endocrinol* 2011 Jun; 27(6):434-438.
 27. Tahara M, Shimizu T, Shimoura H. Preliminary report of treatment with oral contraceptive pills for intermenstrual vaginal bleeding secondary to a cesarean section scar. *Fertil Steril* 2006 Aug;86(2):477-479.
 28. Api M, Boza A, Gorgen H, Api O. Should cesarean scar defect be treated laparoscopically? A case report and review of the literature. *J Minim Invasive Gynecol* 2015 Nov-Dec;22(7): 1145-1152.
 29. Shao MJ, Hu M. A growing concern: Cesarean scar defect and massive uterine bleeding. *J Clin Case Rep* 2015;5:599.
 30. Gubbini G, Casadio P, Marra E. Resectoscopic correction of the “isthmocele” in women with postmenstrual abnormal uterine bleeding and secondary infertility. *J Minim Invasive Gynecol* 2008 Mar-Apr;15(2):172-175.
 31. Chang Y, Tsai EM, Long CY, Lee CL, Kay N. Resectoscopic treatment combined with sonohysterographic evaluation of women with postmenstrual bleeding as a result of previous cesarean delivery scar defects. *Am J Obstet Gynecol* 2009 Apr;200(4):370-374.
 32. Gubbini G, Centini G, Nascetti D, Marra E, Moncini I, Bruni L, Petraglia F, Florio P. Surgical hysteroscopic treatment of cesarean-induced isthmocele in restoring fertility: Prospective study. *J Minim Invasive Gynecol* 2011 Mar-Apr;18(2): 234-237.
 33. Fabres C, Arriagada P, Fernández C, Mackenna A, Zegers F, Fernandez E. Surgical treatment and follow-up of women with intermenstrual bleeding due to cesarean section scar defect. *J Minim Invasive Gynecol* 2005 Jan-Feb;12(1):25-28.