

Hysteroscopic management of symptomatic fibrosed cervical stenosis associated with Caesarean scar defect (CSD)

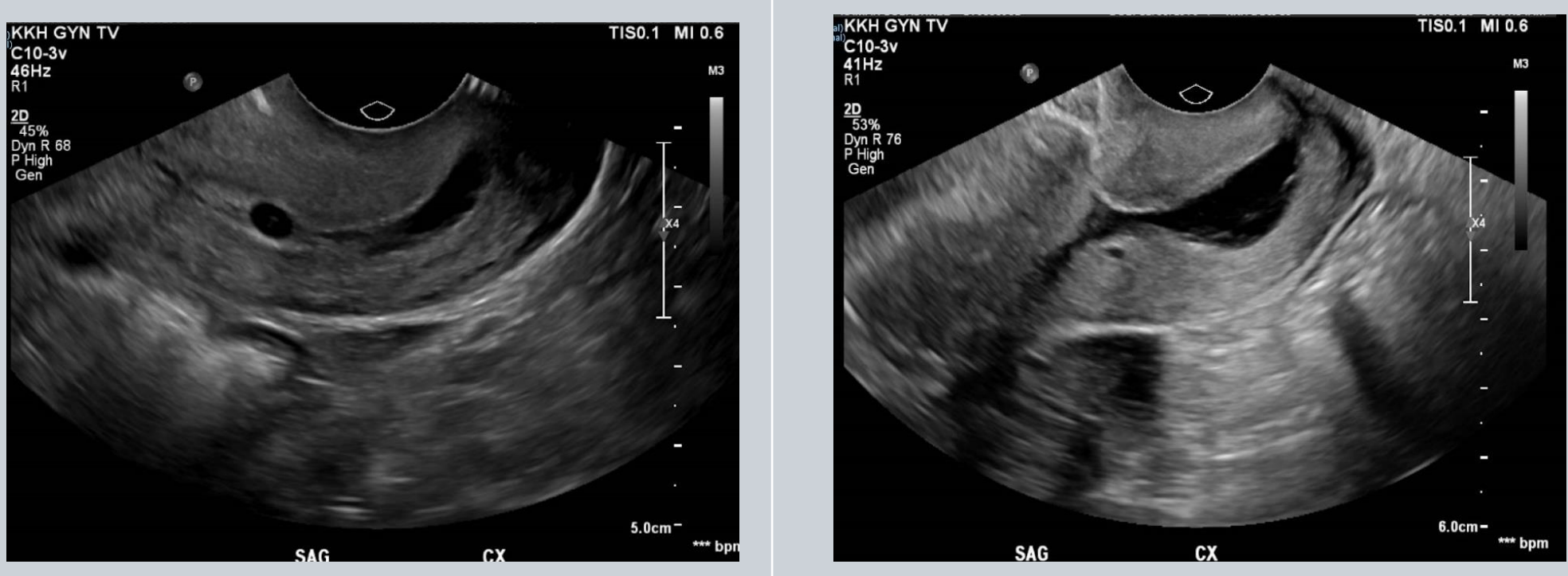
Megan Ruien Ling¹, Dr Hui Min Angela Ho², Dr Shahul Hameed Mohamed Siraj², Associate Professor Bernard Chern Su Min²

¹Yong Loo Lin School of Medicine, National University of Singapore, Department of Minimally Invasive Surgery, Division of Obstetrics and Gynaecology, K. K. Women's and Children's Hospital, Singapore

Introduction

- Uterine cervical stenosis is **difficult to diagnose** as patients present heterogeneously. [1]
- CSDs are often **overlooked as a potential cause** despite rising rates of lower segment Caesarean Section (LSCS) globally. [2]
- In this series, we present three cases of symptomatic cervical stenosis secondary to CSD to provide useful insights into the risk factors, presentation and novel hysteroscopic treatment of uterine cervical stenosis secondary to CSD fibrosis.

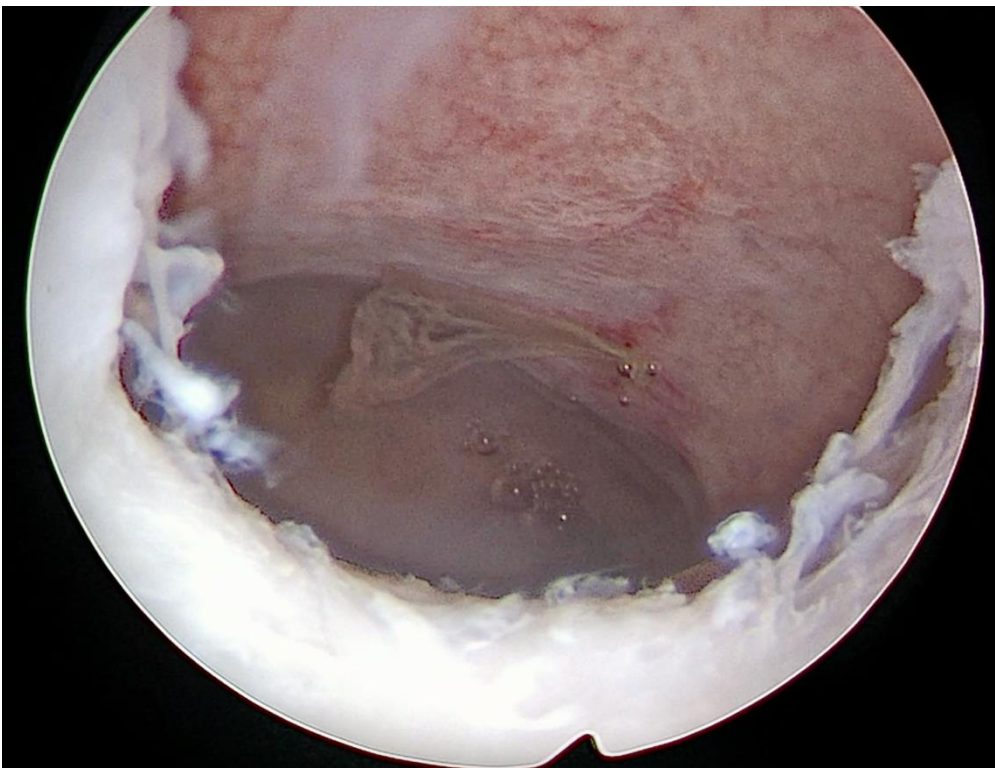
Case Presentations

	Case 1	Case 2	Case 3
Demographics	41-year-old lady	47-year old lady	38-year-old lady
Obstetric history	Para 4, 4x LSCS	Para 2, 2x LSCS	Para 1, 1x LSCS
Presentation	4-month history of cyclical menstrual pain with brown discharge	6-month history of intermenstrual bleeding	Surgical evacuation of spontaneous miscarriage 3-month history of menorrhagia, intermenstrual and irregular menstrual bleeding Background of recurrent endocervical abscess
Physical examination findings	Apyrexial with stable vital signs Unremarkable abdominal, cervical and vaginal examinations		Pinpoint cervix
Transvaginal ultrasound pelvis findings			
Management	Abnormally distended cervix with haematotracheolos. Lower segment Caesarean scar niche noted. • Diagnostic hysteroscopy with routine 0.9% NaCl 5.5-mm hysteroscopy under general anaesthesia, with a gemeprost pessary inserted 2 hours pre-operatively for cervical preparation. • All three cases had a pinpoint cervix that required cervical dilation with Hegar dilators for cannulation. Within the endometrial cavity, a large LSCS niche was noted for all there patients. • Case 1: fibrotic tissue occupying the entire endocervical canal, dilated by hysteroscopic alligator and scissors.		
Histopathology	• Myometrium and Cervical tissue, consistent with findings of Caesarian Scar Niche • No overt hyperplasia, nuclear atypia or malignancy		
Post-operative Recovery	Patients briefed about diagnosis and subsequent intervention, and made a good recovery with resolution of menstrual abnormalities after initial spotting		
Long-term recovery	All patients were well and symptom free 4 months post-operatively.		

Discussion

1. Revising risk factors for Cervical Stenosis – Individuals receiving exclusive LSCS deliveries are more prone to cervical stenosis

- Traditionally, the lower uterine segment scar post-LSCS is limited to the uterine cervical isthmus. [3] However, thinning and fibrosis of the **posterior and lateral uterine muscle** layers have also been observed during caesarean scar repairs and in Case 1. [4]
- Proposed mechanism of fibrosis: uterine stretch and expansion during pregnancy
 - **Tissue microtrauma → superficial translocation of basal endometrial fragments → invagination into the myometrium through microdehiscences in the endometrial-myometrial junctional zone → fibrosis and scar formation.** [5]
- This invagination also causes adenomyosis, and may explain the association between adenomyosis and larger Caesarean Scar defects. [5, 6]
- Most significant at cervix: **Quick rate and extent** of cervical effacement, and will be **clinically significant** as the **narrowest** portion of the uterus
- Risk factors for presenting with **symptomatic cervical stenosis: Exclusive LSCS Deliveries**
 - With normal vaginal delivery: significant cervical dilation by infant through the birth canal during labour
 - With LSCS: Cervical distension **equivalent to nulliparous women**, but **confounded by cervical fibrosis secondary to microdehiscence in pregnancy**
- Similar case by Thomas et al: Cervical stenosis and haematometra post-LSCS in a 36-year-old lady with exclusive LSCS deliveries [7]



Normal endometrial cavity with Caesarean Scar niche and dense scar tissue over the posterior aspect after resection of scar

2. Unique sonographic presentation of Cervical Stenosis

- All patients presented with haematotracheolos, **distal to the area of stenosis** in the internal os.
- Proposed explanation: Haematotracheolos is a **milder phenotype** of cervical stenosis
 - In post-exclusive LSCS patients, the fibrosed internal os and stenosed external os create a **pathological sealed compartment** within the endocervical canal, causing poor drainage of cervical secretions and menstrual blood.
 - While this also occurs in the endometrial cavity, the sealed endocervical canal is a **smaller compartment** that is more **easily distensible**.
- Case 2, who reported a longer history of menstrual abnormalities (more **advanced cervical stenosis**), presented with **haematometra and haematotracheolos**.

3. Novel hysteroscopic approach to treatment to minimize complications

- While hysteroscopy is the gold standard treatment for cervical stenosis, it paradoxically **increases the risk of post-instrumentation cervical stenosis**. [1,8]
- In case 1, we employed **temporary stenting** with a **Foley catheter** for **7 days after hysteroscopy** and limited scar resection to **prevent complications**
 - **Well tolerated** by patient – mild abdominal cramping, which abated following removal during post-operative review
- Witt et al: Successful temporary stenting with nasopharyngeal airway
- However, an indwelling Foley catheter is **more secure (longer, balloon component), cheaper and more accessible** within the gynaecological operating theatre
- Optimal duration of stenting remains elusive, and requires further investigation

Conclusion

- With the rise of LSCS, the incidence of uterine cervical stenosis will follow. [3]
- Our study proposes more **specific risk factors, early clinical manifestations** and a **novel treatment method**, which are not widely available in literature.

References

1. Vitale SG, De Angelis MC, Della Corte L, Saponara S, Carugno J, Laganà AS, Török P, Tinelli R, Pérez-Medina T, Ertas S *et al*: Uterine cervical stenosis: from classification to advances in management. Overcoming the obstacles to access the uterine cavity. *Arch Gynecol Obstet* 2024, **309**(3):755-764.

2. Angolile CM, Max BL, Mushemba J, Mashauri HL: Global increased cesarean section rates and public health implications: A call to action. *Health Sci Rep* 2023, **6**(5):e1274.

3. Sholapurkar SL: Etiology of Cesarean Uterine Scar Defect (Niche): Detailed Critical Analysis of Hypotheses and Prevention Strategies and Peritoneal Closure Debate. *J Clin Med Res* 2018, **10**(3):166-173.

4. Siraj SHM, Lionel KM, Tan KH, Wright A: Repair of the myometrial scar defect at repeat caesarean section: a modified surgical technique. *BMC Pregnancy Childbirth* 2021, **21**(1):559.

5. Kobayashi H, Kishi Y, Matsubara S: Mechanisms Underlying Adenomyosis-Related Fibrogenesis. *Gynecol Obstet Invest* 2020, **85**(1):1-12.

6. Shakki Katouli F, Zebardast J, Tavoli Z, Bayani L, Azizinik F, Moradpour M, Mardani R, Meimani N, Fathi S: Evaluation of Association Between Adenomyosis and Caesarean Scar Defect. *J Ultrasound Med* 2024, **43**(3):553-560.

7. Thomas S, Roy P, Biswas B, Jose R: Complete Cervical Stenosis Following Cesarean Section & VVF Repair. *J Obstet Gynaecol India* 2012, **62**(Suppl 1):49-51.

8. Di Spiezio Sardo A, Taylor A, Tsirkas P, Mastrogamvrakis G, Sharma M, Magos A: Hysteroscopy: a technique for all? Analysis of 5,000 outpatient hysteroscopies. *Fertil Steril* 2008, **89**(2):438-443.