From Diagnosis to Repair: Caesarean Scar Isthmocele (Niche)

Executive Summary · Country Focus: Tunisia

PART 1 · EXECUTIVE SUMMARY

Overview

A caesarean scar isthmocele, also called a niche or caesarean scar defect, is an indentation in the myometrium at the site of a previous caesarean section. International consensus now defines a niche as an indentation of at least 2 mm in depth at the scar, with a large niche usually indicated by a residual myometrial thickness (RMT) of 3 mm or less. Because the defect forms in the lower uterine segment, where the hysterotomy is made, every woman who has had a caesarean birth carries some risk, and that risk rises with each additional caesarean section.

The condition is increasingly relevant to African practice. Caesarean section rates are rising across the continent, with Northern Africa, including Tunisia, among the regions with the highest rates, while many women elsewhere now have two or more scars. Most niches are small and silent and need no treatment. Larger defects, however, can cause postmenstrual brown spotting, dysmenorrhoea, chronic pelvic pain, painful intercourse and secondary subfertility, and in a later pregnancy they are associated with caesarean scar pregnancy, placenta accreta spectrum, scar dehiscence and uterine rupture. These symptoms are frequently attributed to infection or contraception, so the niche itself is often overlooked.

This WATOG Africa case series session, with Tunisia as the country focus, set out a practical, symptom guided approach that can be adapted to settings with different levels of resources. Its core principles were to use transvaginal ultrasound first, to treat only clinically significant defects, and to choose between observation, hormonal treatment, hysteroscopic resection and surgical repair according to the woman's symptoms, fertility plans, RMT and the expertise available. The session also emphasised prevention at the time of caesarean section and careful planning of any pregnancy after repair.

Approach at a Glance

Who to treat	Symptomatic women, or those with fertility concerns where the defect is thought relevant; not every incidental niche
Rule out first	Pregnancy, cervical or sexually transmitted infection, hormonal causes, polyps, fibroids and cervical lesions before blaming the niche
First imaging	Transvaginal ultrasound, ideally soon after menstruation, with saline infusion sonography if needed; MRI is rarely required
Key measurement	Residual myometrial thickness over the defect (session thresholds: below 2 mm to 3 mm), with length, width, depth and position
Options	Observation, hormonal therapy, hysteroscopic resection, vaginal, laparoscopic or robotic, or open repair
Surgical caution	Careful bladder dissection; protect the remaining myometrium and the lower edge of the niche
After repair	Pregnancy interval individualised (about 3 to 6 months discussed); early scar pregnancy scan, placental assessment and planned delivery
Prevention	Avoid unnecessary caesareans, site the incision carefully, close the hysterotomy precisely and optimise healing

Evidence Snapshot

Question	What the evidence shows
How common is a niche?	24 to 70% of women on transvaginal ultrasound and 56 to 84% on saline infusion sonography after a caesarean

Question	What the evidence shows
What is the main symptom?	Postmenstrual spotting, reported by roughly 30 to 50% of women with a niche; larger defects cause more symptoms
Who is at higher risk?	Women with multiple caesareans, caesarean in advanced labour, a retroflexed uterus, infection, diabetes or obesity
Does closure technique matter?	Findings are inconsistent: some trials show a thicker scar after double layer closure, while large pragmatic trials show no difference in symptoms
Does treatment work?	A randomised trial found hysteroscopic resection reduces spotting; repair series report improvement in most women and a thicker myometrium
Does repair improve fertility?	Not proven: evidence is observational and randomised trials are lacking
What about later pregnancy?	Higher risk of scar pregnancy, accreta spectrum and rupture; evidence on the safest interval and mode of delivery is limited

Why This Matters for Africa

Caesarean section is a life saving operation, yet its long term consequences are rarely discussed with women or followed up in practice. As caesarean rates continue to rise, the number of women living with a uterine niche will grow, and so will the gynaecological, fertility and obstetric problems linked to it.

Access to the tools needed for diagnosis and treatment is uneven. Transvaginal ultrasound and trained sonographers are concentrated in larger centres, and hysteroscopy, laparoscopy and robotic surgery remain scarce. The session therefore stressed approaches that work across levels of care: careful history taking, targeted transvaginal scanning, hormonal treatment for women not seeking pregnancy, and vaginal or open repair where minimally invasive surgery is unavailable. Tunisia's investment in certified minimally invasive surgery training for trainees was highlighted as a model for building regional capacity.

Key Messages

- Treat the patient, not the scan: symptoms, fertility intentions and clinical significance guide management.
- Exclude other causes of postmenstrual spotting before attributing symptoms to the niche.
- Start with accessible imaging, scan soon after menstruation, and measure the RMT, which determines the procedure.
- Individualise treatment; hormonal therapy suits women not seeking pregnancy, while resection or repair suits selected symptomatic or subfertile women.
- Protect the remaining uterine muscle and take great care with the bladder during any surgical approach.
- Plan pregnancy after repair carefully: confirm an intrauterine pregnancy early and assess the placenta, because scar pregnancy, accreta spectrum and rupture are the main concerns.
- Prevention begins at caesarean section, through careful decision making, incision placement and closure.
- Important evidence gaps remain on RMT thresholds, fertility benefit, recurrence and pregnancy outcomes after repair.

Priority Actions

- Clinicians: ask about postmenstrual spotting and pain at postnatal and gynaecology visits, consider a niche in women with a previous caesarean, and audit hysterotomy closure practice.
- Sonographers and gynaecologists: adopt standardised reporting of niche size, RMT and position relative to the internal os.
- Training programmes: expand hands on training in transvaginal ultrasound, hysteroscopy and laparoscopy, including vaginal repair where equipment is limited.
- WATOG Africa network: share cases and outcomes across countries to build African evidence on niche management and pregnancy after repair.

PART 2 · DETAILED SUMMARY

1. Definition and Terminology

An international Delphi consensus defines a niche as an indentation of at least 2 mm in depth at the site of the caesarean scar. A large niche is usually defined by a residual myometrium of 3 mm or less, or a loss of 50% or more of the adjacent myometrial thickness. A complex niche has branches or additional pouches. The same defect is also called an isthmocele, scar defect or pouch; rarely, a defect communicates with the peritoneal cavity (uteroperitoneal fistula).

2. Prevalence and Risk Factors

Niches are very common: in a systematic review, prevalence was 24–70% on transvaginal ultrasound and 56–84% on saline infusion sonography, so a finding alone does not mean a problem. Factors associated with larger or more symptomatic defects include:

- Multiple caesarean sections, with risk increasing with number.
- Caesarean in advanced labour, when the cervix is fully effaced and the incision is very low.
- A retroflexed uterus, which stretches and impairs healing of the scar.
- Closure technique: evidence is inconsistent, with some trials showing thicker residual myometrium after double-layer closure and others, including large pragmatic trials, showing no difference in symptoms.
- Possible contributors to poor scar healing, including infection, diabetes and obesity.

3. Why a Niche Causes Symptoms

The scar is thin, fibrotic and poorly contractile, so menstrual blood pools in the defect and drains slowly after menstruation. Retained old blood, chronic inflammation and fragile new vessels cause brown spotting, pain and dyspareunia. Fluid in the niche or cavity may also impair sperm transport and embryo implantation, which is why some women with unexplained secondary infertility are found to have a niche.

4. Clinical Presentation and Pregnancy Risks

Feature	Notes
Gynaecological	Prolonged or irregular bleeding, especially brown spotting after menses; dysmenorrhoea; chronic pelvic pain; dyspareunia
Reproductive	Secondary infertility; reduced success of embryo transfer when fluid is present
Pregnancy	Caesarean scar pregnancy, placenta praevia and accreta spectrum, scar dehiscence and uterine rupture
Many women	No symptoms at all; an incidental niche does not need treatment

Work-up of postmenstrual spotting. Before attributing symptoms to the niche, exclude:

- Pregnancy, and cervical or sexually transmitted infection (chlamydia, gonorrhoea).
- Hormonal causes, including the effect of hormonal contraception.
- Endometrial or cervical pathology such as polyps, fibroids, chronic endometritis and cervical lesions, and check that cervical screening is up to date.

5. Diagnosis and Assessment

Modality	Role
Transvaginal ultrasound	First-line: accessible, relatively cheap and effective. Scanning soon after menstruation, when fluid is present in the niche, improves detection
Saline or gel infusion sonography	Distends the cavity and outlines the niche, improving measurement when the standard scan is unclear
Hysteroscopy	Shows the niche, pooled dark blood and associated cavity pathology; allows treatment
Hysterosalpingography	Shows a contrast-filled pouch; useful during infertility work-up but not first-line
MRI	Not routinely needed; helpful for complex defects or surgical planning

Report the length, width and depth of the niche, the RMT, the adjacent myometrial thickness, and the position of the niche relative to the internal os. Before deciding on treatment, also establish whether the woman has symptoms and whether she wishes to conceive.

6. Who Needs Treatment?

Routine screening and treatment of every niche are not justified. Treatment is considered for symptomatic women, and in selected women with infertility where the defect or its fluid is thought to contribute. The following approach was presented, guided by the RMT; thresholds vary in the literature (2–3 mm) and should be interpreted alongside the whole clinical picture.

Clinical situation	Suggested approach
No symptoms	Observation and counselling about future pregnancy
Symptoms, not seeking pregnancy	Hormonal treatment: combined hormonal contraception or levonorgestrel intrauterine system; analgesia for pain
Symptomatic with RMT of about 3 mm or more	Hysteroscopic resection of the lower edge of the niche, with coagulation of abnormal vessels
Symptomatic or infertile with RMT below about 2–3 mm	Surgical repair: laparoscopic or robotic, or vaginal; open surgery if minimally invasive routes are unavailable or unsuitable
Secondary infertility with fluid in the niche and no other cause	Consider resection or repair after counselling that evidence is observational
Large defect, very thin RMT, pregnancy planned	Individualised: discuss repair before pregnancy, or careful antenatal surveillance (expert opinion)

7. Treatment Options in Detail

Option	Role	Evidence and cautions
Observation	Asymptomatic women	Appropriate for incidental findings
Hormonal treatment	Women not wishing to conceive	Combined pills or a levonorgestrel intrauterine system reduce spotting in small studies; does not correct the defect
Hysteroscopic resection	Smaller defects with adequate myometrium	Opens the lower edge to improve drainage; a randomised trial showed fewer spotting days than expectant management. Avoid deep resection near a thin RMT because of perforation and bladder injury risk; laparoscopic observation can be added for safety
Vaginal repair	Selected defects accessible from below	Avoids abdominal incisions; needs vaginal surgical expertise
Laparoscopic or robotic repair	Thin RMT or large defects	Excision of fibrotic tissue and layered closure under direct vision; case series report resolution of spotting in most women and a thicker myometrium after repair. Hysteroscopic guidance helps locate the defect
Open surgery	Symptomatic cases where other routes are unavailable	Effective but more invasive; may be the only option where minimally invasive training or equipment is lacking

Surgical points. The bladder is often densely adherent to the lower uterine segment after caesarean section, so careful dissection to push the bladder down is essential to avoid injury. In repair, remove fibrotic edges until healthy muscle is reached and close in layers without tension. Complications include bladder or ureteric injury, bleeding, infection, adhesions and recurrence of the defect.

8. Technique Notes

- **Hysteroscopic:** resect the lower (distal) edge of the niche to open a drainage pathway and, in some techniques, the upper edge, then coagulate abnormal vessels in the base. Stay shallow, because the remaining muscle is thin and the bladder lies close.
- **Laparoscopic or robotic:** identify the defect (hysteroscopic transillumination helps), dissect the bladder away, excise fibrotic edges, and close the healthy muscle in one or two layers without tension.
- **Vaginal:** anterior approach, mobilising the bladder to expose and repair the defect.
- **After surgery:** allow healing before intercourse and conception, offer contraception in the interval, and consider an ultrasound or saline sonography to confirm a thicker repaired scar before pregnancy.

9. Fertility and Pregnancy after Treatment

- **Timing:** the interval before pregnancy should be individualised. About 3–6 months was discussed, although recommendations in the literature vary, and some experts advise longer after extensive repair.
- **Early scan:** because a niche increases the risk of caesarean scar pregnancy, an ultrasound at about 6–8 weeks should confirm that the gestational sac is within the uterine cavity.
- **Antenatal care:** assess placental position and signs of accreta spectrum in the second trimester, and note the thickness of the lower segment late in pregnancy.
- **Delivery:** repair of a significant niche is often followed by planned repeat caesarean section before labour, typically around 36–38 weeks, as cases of scar dehiscence or rupture have been reported; evidence is limited, so decisions should be individualised in a facility able to manage haemorrhage.
- **Without prior repair:** a woman with a known large niche who becomes pregnant needs individualised counselling about scar pregnancy, accreta and rupture, with serial assessment of the lower segment and a considered decision on trial of labour.

Strong, universally accepted recommendations on fertility outcomes and pregnancy timing after repair are lacking.

10. Prevention at Caesarean Section

- Avoid unnecessary caesarean sections; every avoided primary caesarean prevents a lifetime of scar risk.
- Make the uterine incision in the appropriate segment, avoiding a very low incision in advanced labour where possible.
- Close the hysterotomy carefully with accurate alignment of the tissue edges, avoiding excess diathermy and overly tight sutures.
- Treat infection and manage diabetes and obesity to optimise healing.

11. Challenges in African Settings

- Caesarean sections are increasing, and many women have had several, so niche-related problems will rise.
- Prolonged spotting after caesarean is often attributed to infection or contraceptives, so the niche is not considered.
- Transvaginal ultrasound and trained sonographers are limited outside major centres, and hysteroscopy, laparoscopy and robotic surgery are scarce.
- Training is a priority: Tunisia highlighted certified minimally invasive surgery training, including hysteroscopy and laparoscopy, for trainees.
- Where minimally invasive surgery is unavailable, vaginal or open repair and hormonal management remain valuable options.

12. Evidence Gaps

- Optimal RMT threshold for choosing hysteroscopic or surgical treatment (2 mm versus 3 mm).
- Effect of niche treatment on fertility, recurrence and subsequent pregnancy outcomes.
- Best interval before pregnancy and the safest mode and timing of delivery after repair.
- Standardised measurement and reporting of niches, and the best closure technique to prevent them.

13. Session Notes

The session included a demonstration of Qwiva Health, a clinical decision-support platform for verified healthcare professionals with a consult mode for quick clinical questions, a study mode for detailed learning, linked references and multilingual support; access was free for verified practitioners at the time. The WATOG Africa website, which hosts case series recordings and written summaries, national representative profiles and upcoming events, was formally launched, with 28 of the 54 African countries represented at that time.

14. Key Takeaways

- Treat the patient, not the ultrasound finding.
- Use accessible imaging first and measure the RMT.
- Individualise treatment: observation, hormones, hysteroscopy or repair each have a role.
- Protect the remaining myometrium and take care with the bladder.
- Plan pregnancy after repair: early scan, placental assessment and planned delivery.
- Recognise the evidence gaps and share experience across Africa.