The Egyptian Journal of Hospital Medicine (October 2022) Vol. 89 (2), Page 6523- 6531

Assessment of Cesarean Section Uterine Scar by Transvaginal Ultrasound after Single Versus Double Layer Closure Techniques

Hanan Abdelwahab Meselhy Mousa*, Azza Abdelmageed Abdelhamed,
Somayya Magdeldin Sadek, Abdallah Hassan Gad
Obstetrics & Gynecology Department, Faculty of Medicine, Zagazig University, Zagazig, Egypt
***Corresponding author:** Hanan Abdelwahab Meselhy Mousa, **Mobile:** (+20)01004410720,
E-Mail : hananabdelwahab9992@gmail.com

ABSTRACT

Background: The best way to show a caesarean section (CS) scar is using transvaginal ultrasound, which has better detection rates. The objective of the current study is to detect sonographic features of CS scar after single layer and double layer closure techniques and determine those of better healing and niche development.

Patients and methods: A clinical trial was conducted on 74 pregnant at 39 weeks with single-tone pregnancies. Participants were divided into 2 equal groups. Group SL included 39 primigravidae who underwent single layer closure of the uterine incision during CS, and Group DL included 37 primigravidae who underwent double layer closure of the uterine incision during CS. Participant women were subjected to thorough medical and obstetrical examination, and ultrasound check 3 months following their operations.

Results: Niche features revealed that patients in the double layer group had a significantly larger niche depth than those in the single layer group. Additionally, they had significantly greater residual myometrial thickness as compared to the single-layer group. No statistically significant difference in niche length, breadth, or neighboring myometrial thickness existed between the two groups. The residual myometrium thickness (RMT)/ adjacent myometrium thickness (AMT) ratio was utilized as a marker of uterine scar healing, and our findings indicated that patients in the double layer group had considerably higher healing "RMT/AMT" ratios than those in the single layer group.

Conclusion: With closure of CS incision by double layer, better outcomes have occurred, including incidence of niche development, residual myometrial thickness and healing ratio than the single layer closure.

Keywords: Cesarean Section, Uterine Scar, Transvaginal Ultrasound, Residual myometrium thickness, Adjacent myometrium thickness.

INTRODUCTION

The majority of births are carried out through caesarean section, one of the most popular medical procedures in the world. Although it frequently makes delivery safe, there is still a chance that something bad may happen. Infection wound disruption, venous thromboembolism as well as hemorrhage are some of the short-term consequences of caesarean delivery [(1)]. Although caesarean delivery's obstetric consequences are widely known; potential long-term gynecological diseases have received less attention [(2)].

More focus has lately been placed on the implications of single-layer vs. double-layer uterine incision closure after caesarean sections. Single-layer closure was shown to carry a higher risk of issues than double-layer closure in a number of instances. However, most studies on this subject were retrospective [(3)]. Although clinical results are sparse, double-layer closure is linked to a decreased frequency of big niches and thicker remaining myometrium [(4)].

According to the European Niche Taskforce, a caesarean section site depression that is at least 2 millimetres deep constitutes a niche. The same issue has gone by a number of other names, including caesarean niche, isthmocele post-caesarean section scar defect (PCSD), caesarean delivery scar pouch, and caesarean scar defect [(5)].

Saline infusion sonohysterography, which has greater detection rates than transvaginal ultrasonography, is the best method for showing the c-section niche. However, as ultrasonography is a less invasive imaging technique and is more widely available in clinical settings, it is typically the first diagnostic resource that most medical professionals have at their disposal when examining a patient who has unexplained uterine hemorrhage. According to research, in 50% of women who have previously had a caesarean section, transvaginal sonography (TVS) can, on average, identify the caesarean niche [(6)].

In a contemporaneous study, Glavind measured the residual myometrial thickness, scar defect, depth, width, and length in 68 women who had single layer closure and 81 women who had double layer closure using 2D TVS (Transvaginal sonography). The results of the study showed that double layer closure greatly improves scar quality, reduces the length of scar defects, and thickens the myometrium. For superior long-term results, he also supports two-layer closure [(7)].

In 1990, four important sonographic results were described: a wedge defect, an inwardly projecting scar, an outwardly protruding scar with hematoma, or a retracted scar. Others have characterized the caesarean scar on transvaginal ultrasound (TVUS) as an anechoic triangular region with the apex pointing anteriorly or a filling defect on the anterior isthmus. The defect can occasionally be partially filled with debris and can also resemble a cystic tumor between the bladder and lower uterine portion [(8)].

The objective of this study was to detect sonographic features of CS scar after single layer and

Received:7/7/2022
Accepted:12/9/2022

double layer closure techniques and determine those of better healing and niche development.

PATIENTS AND METHODS

A clinical trial was conducted on 74 pregnant at 39 weeks with single-tone pregnancies; those were attending Obstetrics and Gynecology Hospital, Zagazig University Hospitals.

Selected patients were divided into two groups: *Group 1* included 37 primigravida who had their uterine incision closed in a single layer following a caesarean section, and *Group 2* included 37 primigravida who had a caesarean section and had their uterine incision double-layered closed.

Inclusion criteria: Women aged from 18-35 years, full term pregnant female prepared for primary elective CS, singleton viable pregnancy, estimated fetal weight "EFW" average for gestational age, normally located placenta, and normal amniotic fluid volume.

Exclusion criteria: Patients with the following criteria were excluded from the study: (1) Uterine malformation. (2) Any previous uterine operation. (3) Any factor that could affect healing of the scar: Intrauterine infections, maternal anemia, urinary tract infection.

This is what all of the participants in this research had to go through:

1. **A thorough review of the patient's medical history**, menstrual, obstetric and contraceptive history were taken.
2. **Complete general examination.**
3. **Gynecological Examination:** Including abdomen, pelvic examination (external genitalia, vagina, cervix, bimanual examination.
4. **Routine preoperative laboratory investigations** for all participants in the study as: Complete blood count, complete urine analysis, liver function tests, kidney function tests and fasting blood sugar.
5. **Ultrasonography:** Preoperative abdominal ultrasonographic examination was done by a convex probe. Examination was included: (1) Assure the viability. (2) Biometric measurements: to assess fetal growth, and estimated fetal weight. (3) Umbilical and middle cerebral artery doppler examination for assessment of fetal wellbeing.

Intervention (intraoperative steps):
Elective lower segment caesarean section was planned at 39 weeks. All the surgeries were done by the same surgeon. All patients underwent spinal anesthesia. Opening the abdomen was done through pfannenestiel incision using scalpel. Opening the sc tissue layer, fascial layer and rectus sheath using electrocautery. Opening of muscle layer and the peritoneum was done bluntly to ensure adequate exposure. Transverse incision at the lower segment of uterus, blunt expanding the incision, fetal extraction, cord clamping, placental extraction were done. Exteriorizing the uterus, and closure of uterus was done using of vicryl 1 suture.

In the first group:
With the endometrial layer sandwiched in between by 1 cm, an unlocked single layer continuous suture was used to seal the lower uterine section. The serosa of the uterus is not covered by the suture.

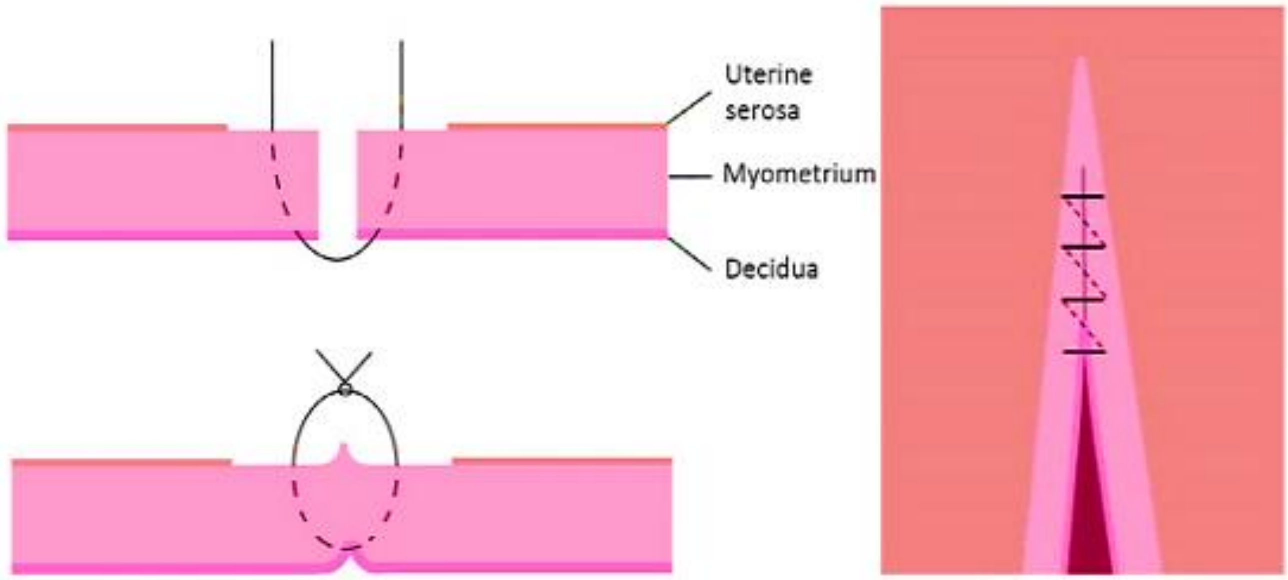


Figure (1): Unlocked Single-layer closure [9].

In the second group:

In order to close the lower uterine segment, a two-layer closure was employed, with the first layer utilizing a continuous unlocked suture and the second layer using a continuous unlocked suture that took surface myometrium. The uterine serosa is not covered by the suture (inverted lambert technique).

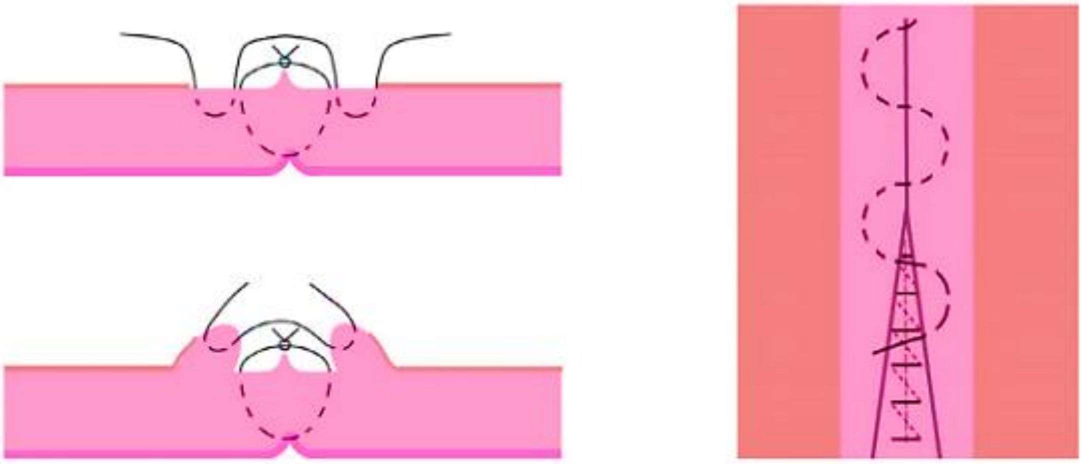


Figure (2): Double-layer closure [9].

Complete hemostasis was done with estimation of blood loss through capacity of surgical gauzes (Through weighing the swabs, bed sheets used in operation by the circulating nurse (Ideally, each abdominal swab should weigh 28 gm and each swab measuring 4 gm should weigh 20 gm) Before use, and after use, must be measured wet or drenched in blood. Given that 1 g of blood is equal to 1 ml of blood, the weight difference would be close to the amount of blood lost. The scrub nurse would be given instructions to use the weighing swabs to dry up all blood in the surgical area; suction would only be used in extreme cases, in which case the blood collected in the suction bottle would be combined with the blood in the swabs. The weight in grammes would be determined using a very precise digital balance.

Closure of abdominal wall in layers was done with vicryl 1 suture. Finally, subcuticular closure of skin was done using prolene suture. Operation time, need to additional homostatic sutures and any complication either intra or postoperative were recorded.

Postoperative: All patients were subjected to standard postoperative care and antibiotic prophylaxis protocol (oral metronidazole 500 mg with a broad spectrum antibiotic every 8 hours for 48 hours) **[10].** Complete assessment and analysis of menstrual pattern, pain or any signs of puerperal sepsis or wound infection for 3 months.

Follow Up (3 months postoperative): All selected participant was subjected to: (1) History: Full detailed history was taken. (2) Full clinical examination was performed.

Ultrasonographic evaluation: Ultrasonographic examination was performed for all ladies included in the study after 3 months' post-operative using: Mindray DC-70 expert with x-insight Shenzhen, china, 2020 ultrasound system using the endocavitary transducer (transvaginal probe DE 11-3E).

Ultrasound evaluation included: (1) Uterus, cervix and adnexae. (2) Assessment of CS scar shape, continuity, thickness, outer borders and vascularization. (3) Niche evaluation was done between days 7 and 14 of the cycle.

A depression with a depth of at least 2 mm at the site of the CS scar was considered to be a niche on transvaginal ultrasonography **[11].**

Ethical consent:

An approval of the study was obtained from Zagazig University Academic and Ethical Committee (IRB Approval (#6957/23-5-2021)). Every patient signed an informed written consent for acceptance of participation in the study. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis:

The collected data were coded, processed and analyzed using EPI-INFO version 7. Data were tested for normal distribution using the Shapiro Walk test. Qualitative data were represented as frequencies and relative percentages. Pearson Chi-Square and Chi-Square for Linear Trend ($\chi 2$) were used to assess qualitatively independent data. Chi square test ($\chi 2$) and Fisher's exact test to calculate difference between two or more groups of qualitative variables. Quantitative data were expressed as mean and standard deviation (SD). Independent samples t-test was used to compare between two independent groups of normally distributed variables (parametric data). P value ≤ 0.05 was considered significant.

RESULTS

Table 1 shows that the two groups did not differ statistically significantly in terms of age or BMI.

Table (1): Demographics characteristics of studied patients.

Variable	Group SL N = 37	Group DL N = 37	t-value	P-value
Age (years):				
Mean ± SD	**22.2 ± 4.7**	**23.05 ± 4.9**	**-0.799**	**0.213**
Range	**18 – 35**	**19 – 34**		
BMI (Kg/m²):				
Mean ± SD	**28.3 ± 2.2**	**28.9 ± 2.4**	**-1.104**	**0.137**
Range	**22.4 – 31.1**	**22.9 – 32.5**		

SL: Single layer; DL: Double Layer.

Surgical statistics, such as operative time, blood loss, and extra sutures, did not statistically vary between the two groups (**Table 2**).

Table (2): Operative data of studied groups.

Variable	Group SL N = 37	Group DL N = 37	t-value	P-value
Operative time (minutes):				
Mean ± SD	**23.7 ± 5.3**	**25.3 ± 6.1**	**-0.795**	**0.429**
Range	**20.0 – 35.0**	**20.0 – 35.0**		
Blood Loss (ml):				
Mean ± SD	**569.3 ± 86.5**	**588.2 ± 86.5**	**-0.939**	**0.350**
Range	**460.0 – 800.0**	**395.0 – 765.0**		
Variable	**No (%)**	**No (%)**	**X^2**	**p-value**
Additional Sutures:				
Yes	**13 (35.13%)**	**7 (18.9%)**	**2.466**	**0.116**
No	**24 (64.87%)**	**30 (81.1%)**		

SL: Single layer; DL: Double Layer.

Regarding sonographic examination of CS scar, our results showed that there was no statistical significant difference between both groups regarding scar continuity. While regarding scar thickness, our result showed individuals with bigger scars—those with double layers—than those with single layers. Compared to the double layer group, the single layer group had a much greater incidence of niche formation (**Table 3 and Figure 1**).

Table (3): Sonographic examination of CS scar among studied groups.

Variable	Group SL N = 37	Group DL N = 37	X^2 value	p-value
	No (%)	**No (%)**		
Continuity of scar				
Continuous	**32 (86.5%)**	**33 (89.2%)**	**0.126**	**0.722**
Discontinuous	**5 (13.5%)**	**4 (10.8%)**		
Presence of Niche:				
Yes	**20 (54.1%)**	**11 (29.7%)**	**4.496**	**0.034***
No	**17 (45.9%)**	**26 (70.3%)**		
Scar thickness:				
Mean ± SD	**5.57 ± 1.33**	**6.8 ± 1.21**	**17.884**	**< 0.001***

Received:7/7/2022
Accepted:12/9/2022

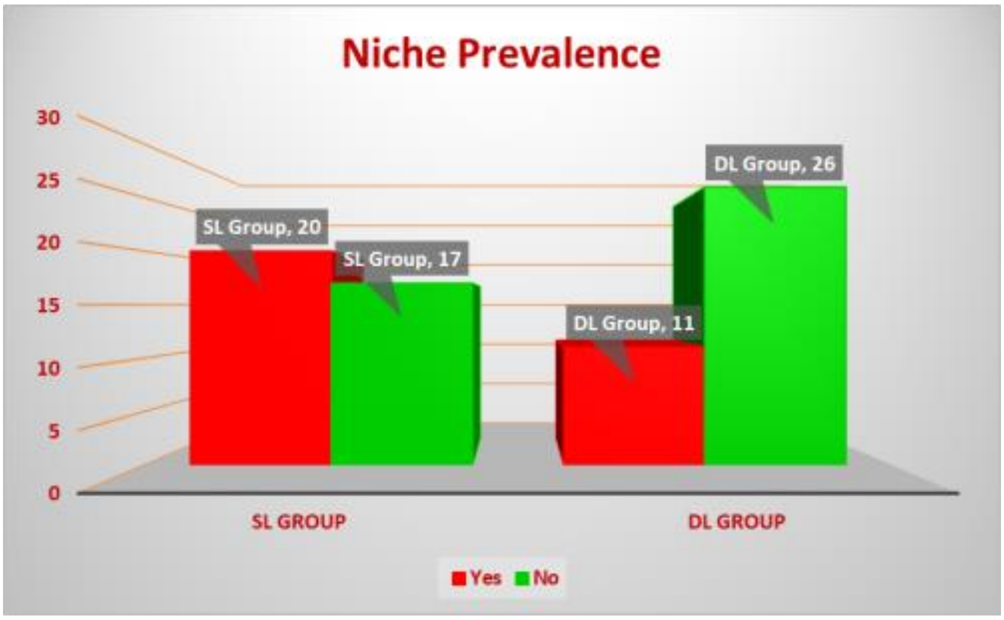


Figure (1): Prevalence of niche development in both studied groups.

Regarding niche depth and residual myometrium thickness (RMT), there was a statistically significant difference between the two study groups. Regarding niche length, breadth and adjacent myometrium thickness (AMT) had no statistical significant difference (**Table 4**).

Table (4): Niche parameters among studied groups.

Variable	Group SL with niche N = 20	Group DL with niche N = 11	t-value	P-value
Length (cm):				
Mean ± SD	**1.1 ± 0.2**	**1.1 ± 0.1**	**0.000**	**1**
Range	**0.9 – 1.8**	**1.0 – 1.3**		
Depth (cm):				
Mean ± SD	**0.5 ± 0.1**	**0.6 ± 0.1**	**2.664**	**0.012***
Range	**0.4 – 0.7**	**0.4 – 0.7**		
Width (cm):				
Mean ± SD	**1.0 ± 0.1**	**1.0 ± 0.1**	**0.000**	**1**
Range	**0.8 – 1.2**	**0.4 – 0.9**		
RMT (cm):				
Mean ± SD	**0.7 ± 0.1**	**0.8 ± 0.1**	**2.664**	**0.012***
Range	**0.1 – 0.9**	**0.4 – 0.9**		
AMT (cm):				
Mean ± SD	**1.3 ± 0.1**	**1.25 ± 0.1**	**0.000**	**1**
Range	**1.1 – 1.4**	**1.1 – 1.4**		

Between the two groups, healing ratio did not differ significantly (**Figure 2**).

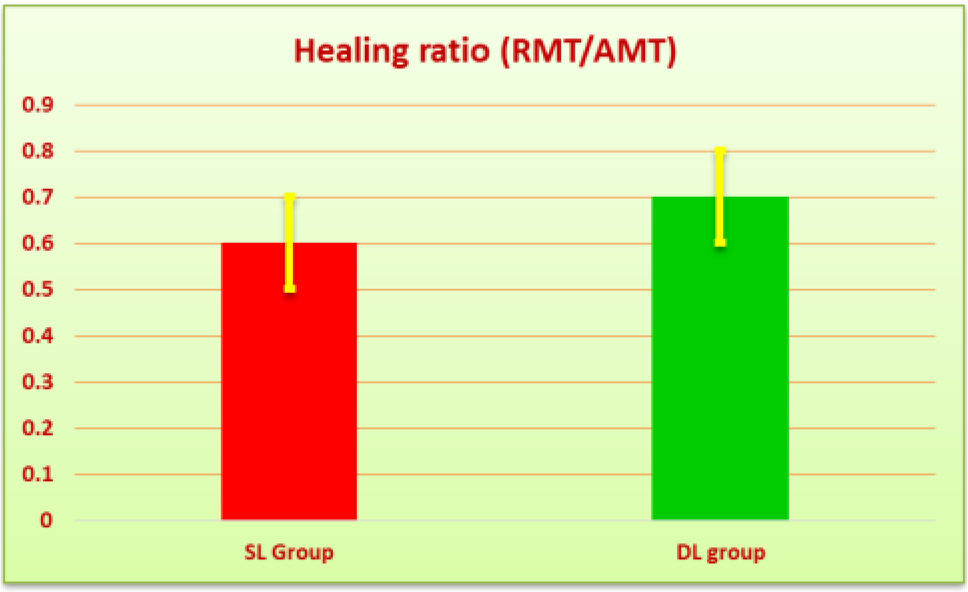


Figure (2): Healing ratio in both studied groups.

In the single layer group, there was no discernible difference between individuals who had niches and those who did not (**Table 5**).

Table (5): Comparison between patients with niche and those without niche within the single layer group.

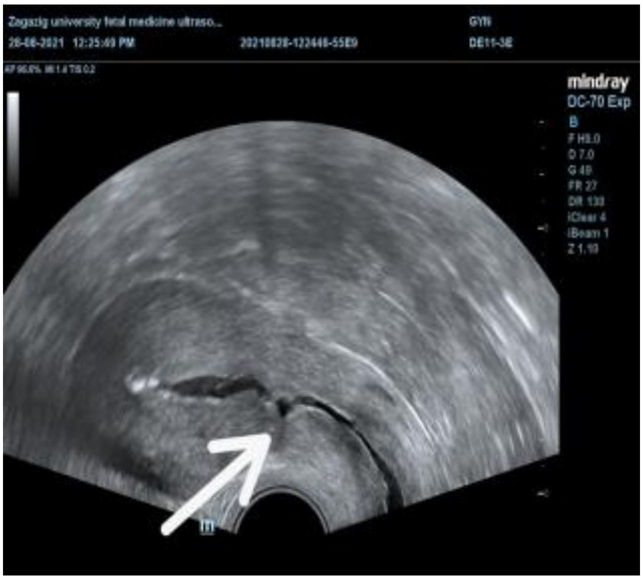
Variable	With Niche N = 20	Without Niche N = 17	t-value	P-value
	Mean ± SD	Mean ± SD		
Age	22.5 ± 2.9	23.3 ± 2.8	0.849	0.401
BMI	28.4 ± 2.1	28.9 ± 2.4	0.676	0.503
Parity	1.37 ± 0.4	1.5± 0.2	1.768	0.081
Blood loss	533.4 ± 90.2	522.1 ± 93.2	0.374	0.710
Additional sutures				
Yes	8	5	0.452	0.501
No	12	12		

In the double layer group, there was no discernible difference between individuals who had niches and those who did not (**Table 6**).

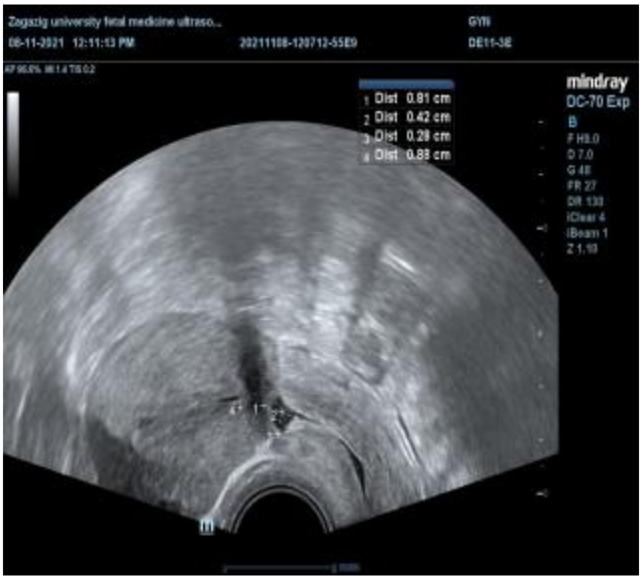
Table (6): Comparison between patients with niche and those without niche within the double layer group.

Variable	With Niche N = 11	Without Niche N = 26	t-value	P-value
	Mean ± SD	Mean ± SD		
Age	20.6 ± 4.3	22.3 ± 3.5	1.261	0.215
BMI	28.2 ± 2.5	28.8 ± 2.1	0.375	0.709
Parity	1.32 ± 0.5	1.41 ± 0.2	1.016	0.312
Blood loss	576.7 ± 87.2	566.2 ± 87.7	0.333	0.740
Additional sutures				
Yes	2 (18.2%)	5 (19.2%)	0.572	0.449
No	9 (81.8%)	21 (80.8%)		

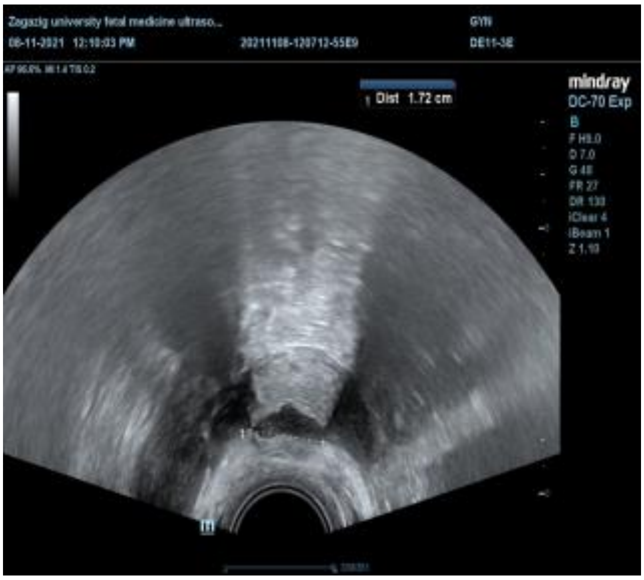
(A) showing ultrasound sagittal view of an intact cesarean section scar



(B) showing ultrasound sagittal view of a cesarean scar defect



(C) showing ultrasound sagittal view of cesarean scar defect with measurements of (1) length (2) depth (3) RMT (4) AMT



(D) showing ultrasound transverse view of cesarean scar defect with width measurement

Figure (3): Case study having section scar.

DISCUSSION

RMT, uterine scar defect, and uterine scar healing are all believed to be impacted by the surgical method used for uterus closure after CS. However, there is no accepted standard technique for uterine closure, and there is also no suggestion for the surgery that is supported by data [12]. Previous research indicated that compared to single-layer (SL) closure, double-layer (DL) closure had thicker residual myometrium and a reduced incidence of severe defects. However, there is currently inadequate evidence to support any further therapeutic effects [4].

Our findings revealed no statistically significant difference in the basic demographic factors of maternal age, BMI, and gestational age (GA) between the two groups of the study. Similar to our findings were **Khamees *et al.*** [13] **and Hanacek *et al.*** [9] who stated that the mother's age, BMI, or GA did not statistically differ between the two research groups.

Our results showed that there was no appreciable variation in the duration of the procedure between the two research groups (within 44 minutes in both groups), the amount of blood lost (588.2 ± 86.5 mL in the single layer group and 569.3 ± 86.5 mL in the double layer group), or the need for extra hemostatic sutures.

In agreement with our findings was **Bennich *et al.*** [14] and **Khamees *et al.*** [13] as stated, between the two research groups, there was no statistically significant difference in the amount of blood lost, the length of the procedure, or the number of times that additional hemostatic sutures were needed. However, **Bamberg *et al.*** [15] discovered that compared to the double-layer groups, the single-layer groups needed more highly significant sutures.

Regarding the frequency of niche development, our findings revealed that only 29.7% (11/37) of cases in the double layer group showed niche development, compared to 54.05% (20/37) of cases in the single layer group with a statistically significant difference.

Khamees *et al.* [13] demonstrated a statistically significant difference between the frequency of niche formation in single layer patients (65%) and double layer patients (30%). This is consistent with our findings.

In the prospective, randomized trial done by **Baran *et al.*** [16] 282 women underwent surgeries, 109 of which included single-layer closure and 116 of which involved double-layer closure, in order to compare how the two treatments affected the uterine scar's ability to heal after a caesarean delivery. The niche rates for the two groups, which were 37 percent for the single-layer group and 45.7% for the double-layer group, did not vary statistically significantly.

The patients in the double layer group had much deeper niches than those in the single layer group, according to our findings on niche metrics. Additionally, they had significantly greater residual myometrial thickness as compared to the single-layer group (RMT). No statistically significant difference in niche length, breadth, or neighboring myometrial thickness existed between the two groups (AMT).

The RMT/AMT ratio was utilized as a marker of uterine scar healing, and our findings indicated that patients in the double layer group had considerably higher healing "RMT/AMT" ratios than those in the single layer group.

In the meta-analysis done by **Stegwee *et al.*** [4] **and Marchand *et al.*** [17] they claimed that although the healing ratio is greater with DL closure than SL closure, the single layer group had thinner RMT than the double layer group. However, **Qayum *et al.*** [18] observed that there was no significant difference in the healing ratio between the two groups.

In agreement with our findings was **Glavind *et al.*** [7] they discovered that women with double-layer closure had significantly higher RMTs than women with single-layer closure (p=0.04). Women who had single-layer closures compared to those who had double-layer closures also exhibited scar defects that were longer (p=0.01).

In contrast to our results, **Bennich *et al.*** [14] at discharge and five months after birth, RMT did not differ in the two groups, "Single layer and double layer." At both tests, RMT was almost half that of the healthy myometrium. They asserted that when an unlocked technique is used, a single-layer closure of a Cesarean uterine incision is equivalent to a double-layer closure in terms of RMT.

Despite the fact that the primary endpoint, febrile morbidity, did not significantly vary between single layer closure and double layer closure of the uterus, a Cochrane review based on 19 studies found that single layer closure was linked to lower mean blood loss [19]. The RCOG recommends that the uterine incision be sutured in two layers, with the exception of research-related material. A meta-analysis of 9 RCTs including 3969 women found no meaningful differences in the frequency of caesarean scar anomalies, uterine dehiscence, or uterine rupture between single layer closure and double layer closure [20].

In conclusion, with closure of CS incision by double layer, better outcomes have occurred, including incidence of niche development, residual myometrial thickness and healing ratio than the single layer closure.

Financial support and sponsorship: Nil.
Conflict of interest: Nil.

REFERENCES

1. **Mostafayi M, Rabie S (2020):** The prevalence of Maternal Short-Term Complications of cesarean section and its relationship with body mass index. Pajouhan Scientific Journal, 2:44-51.
2. **Brook A, Clarke F, Bhatia K (2020):** Gynaecological morbidity associated with caesarean niche: increasing awareness, prevention, and management. The Obstetrician and Gynaecologist, 2:122-130.
3. **Walsh C, Palmer K (2020):** Too close to call: uterine closure technique at caesarean section. BJOG: An International Journal of Obstetrics &Gynaecology, 128(5):879. doi: 10.1111/1471-0528.
4. **Stegwee S, Jordans I, van der Voet L *et al.* (2018):** Uterine caesarean closure techniques affect ultrasound findings and maternal outcomes: a systematic review and meta-analysis. BJOG., 125:1097-1108.
5. **Tower A, Frishman G (2019):** Cesarean scar defects: an underrecognized cause of abnormal uterine bleeding and other gynecologic complications. Journal of Minimally Invasive Gynecology, 5:562-572.
6. **Mynbaev O, Babenko T, Shi Z *et al.* (2018):** Uterine morbidity: Cesarean section scar complications. In: Tinelli A, Pacheco LA, Haimovich S, editors. Chapter 41 in Hysteroscopy. Cham: Springer, pp. 421-468. doi: 10.5772/intechopen.90775
7. **Glavind J, Madsen L, Uldbjerg N *et al.* (2013):** Ultrasound evaluation of Cesarean scar after single- and double-layer uterotomy closure: a cohort study. Ultrasound Obstet Gynecol., 2:207-212.
8. **Schepker N, Garcia-Rocha G, von Versen-Höynck F *et al.* (2018):** Clinical diagnosis and therapy of uterine scar defects after caesarean section in non-pregnant women. Archives of Gynecology and Obstetrics, 6:1417-1423.
9. **Hanacek J, Vojtech J, Urbankova I *et al.* (2020):** Ultrasound cesarean scar assessment one year postpartum in relation to one- or two-layer uterine suture closure. Acta Obstet Gynecol Scand., 99(1):69-78.
10. **American College of Obstetricians and Gynecologists "ACOG" Practice Bulletin No. 205. (2019):** Vaginal Birth After Cesarean Delivery. Obstet Gynecol., 2:110-127.
11. **Jordans I, De Leeuw R, Stegwee S *et al.* (2019):** Sonographic examination of uterine niche in non-pregnant women: a modified Delphi procedure. Ultrasound in Obstetrics and Gynecology, 1:107-115.
12. **Stegwee S, van der Voet L, Ben A *et al.* (2021):** Effect of single- versus double-layer uterine closure during caesarean section on postmenstrual spotting (2Close): multicentre, double-blind, randomised controlled superiority trial. BJOG., 128:866-878.
13. **Khamees R, Khedr A, Shaaban M *et al.* (2018):** Effect of Single versus Double Layer Suturing on Healing of Uterine Scar after Cesarean Delivery. Suez Canal Uni Med J., 2:140-145.
14. **Bennich G, Rudnicki M, Wilken-Jensen C *et al.* (2016):** Impact of adding a second layer to a single unlocked closure of a Cesarean uterine incision: randomized controlled trial. Ultrasound Obstet Gynecol., 4:417-422.
15. **Bamberg C, Dudenhausen J, Bujak V *et al.* (2016):** Prospective Randomized Clinical Trial of Single vs. Double Layer Closure of Hysterotomy at the Time of Cesarean Delivery: The Effect on Uterine Scar Thickness. Ultraschall Med., 3:343-351.
16. **Baran Ş, Kalaycı J, Durdag G *et al.* (2021):** Single- or double-layer uterine closure techniques following cesarean: A randomized trial. Acta Obstet Gynecol Scand., 100:531-537.
17. **Marchand G, Masoud A, King A *et al.* (2021):** Effect of single- and double-layer cesarean section closure on residual myometrial thickness and isthmocele - a systematic review and meta-analysis. Turk J Obstet Gynecol., 18:322-332.
18. **Qayum K, Kar I, Sofi J *et al.* (2021):** Single- Versus Double-Layer Uterine Closure After Cesarean Section Delivery: A Systematic Review and Meta-Analysis. Cureus, 9:e18405. doi: 10.7759/cureus.18405.
19. **Dodd J, Anderson E, Gates S *et al.* (2014):** Surgical techniques for uterine incision and uterine closure at the time of caesarean section. Cochrane Database Syst Rev., 7:CD004732. doi: 10.1002/14651858.CD004732.
20. **Di SpiezioSardo A, Saccone G, McCurdy R *et al.* (2014):** Risk of Cesarean scar defect following single- vs double-layer uterine closure: systematic review and meta-analysis of randomized controlled trials. Ultrasound Obstet Gynecol.,5:578-583.