

ASSESSMENT OF UTERINE SCAR AFTER MODIFIED DOUBLE LAYER VERSUS DOUBLE LAYER CLOSURE OF THE UTERUS DURING CESAREAN SECTION

By

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ABSTRACT

Background: Modified two layers closure consists of full thickness closure of uterus by interrupted horizontal mattress sutures in first layer followed by a continuous running suture in the second layer. To assess the healing of scar and the risk of uterine rupture in a subsequent pregnancy, ultrasonography is used in the evaluation of uterine scar in the postpartum period.

Objective: To compare the effect of different suturing techniques in cesarean section in terms of blood loss and operative time during the operation and scar thickness three months after the operation.

Patients and methods: The study included a total 60 women, they were divided into two equal groups:

- **Group A** underwent double layers closure of the uterus after lower segment cesarean section.
- **Group B** underwent modified double layers closure of the uterus after lower segment cesarean section.

Ultrasound evaluation of the scar thickness was performed at three months post partum.

Results: Results of the study showed that there was a statistically significant higher scar thickness in group B compared to group A.

Conclusion: Change in suturing technique affected the thickness of uterine scar as detected by ultrasonography in post partum period. Scar thickness significantly increased with modified two layers closure when compared with traditional two layers closure of lower transverse uterine incision.

Key words: Uterine scar, Modified double layers, Cesarean section.

INTRODUCTION

A low transverse incision is the preferred method of cesarean delivery. Traditionally, closure of the uterine incision has been in two layers, although in the past decade an increasing number of obstetricians have moved to single layer closure due to advantage of shorter operative time, decreased blood loss, lower rates of endometritis and shorter

hospital stay (*Durnwald and Mercer, 2012*).

Many studies have shown an increase in uterine scar disruption after one layer closure. The authors introduced another method for closure of uterine incision at the time of repeated cesarean section, especially, because lower segment is most thinned out at that time. It consists of full thickness closure by interrupted horizontal

mattress sutures in first layer followed by a continuous running suture in the second layer (modified two layers closure) (*Hamar et al., 2012 and Cheung et al., 2015*).

In regard to the closure of the wound, accurate apposition of all parts must be secured. Some operators employ continuous sutures in several layers. This seems to increase the risk of subsequent gaping of the wound when retraction takes place, and the use of ordinary interrupted sutures prevent separation of the wound between the stitches (*Bujold et al., 2016*).

It is generally been found that the thicker the uterine scar the lower is the rate of complications. One may postulate that a thicker scar is stronger, and thus performs better than a thinner one (*Hamar et al., 2012*).

Ultrasound examination is an objective method for assessment of uterine scar defects. Transvaginal ultrasound examination is a highly accurate method for detecting cesarean scar defects, for example, in association with abnormal bleeding or thinning of the residual myometrium (*Hayakawa et al., 2011*).

The present work aimed to assess uterine scar thickness by trans vaginal ultrasound after double versus modified double layers of closure of the uterus three months postpartum.

PATIENTS AND METHODS

Inclusion criteria:

- Women aged from 18-35 years.
- Full term primigravida.
- Elective cesarean section.
- Singleton pregnancy.

- Medically free patients.

Exclusion criteria:

- Emergency cesarean section.
- Previous uterine scar (cesarean section, myomectomy).
- Any factor that could affect healing of the scar: Intrauterine infections, maternal anemia, UTI, maternal fever < 37.5 °.
- Placenta previa or abruptio placenta.
- Medical disorders as diabetes mellitus and hypertension.

Patients randomly assigned to the two layers closure had an initial closure with running locking suture with Polyglycan 910 (vicryl 1). An additional layer of Polyglycan 910 was used to imbricate the first layer in a continuous non-locking suture. Patients randomly assigned to modified two layers closure had first layer closure by interrupted horizontal mattress sutures taking full thickness of decidua and myometrium. The second layer folded muscles over the first layer of sutures in running non-locking sutures.

The amount of blood loss during the operation was measured by the number of towels soaked with blood (soaked towel equals 200 ml blood) and the amount of blood in the suction.

Three months later, all women underwent transvaginal ultrasound scan.

Statistical analysis: Data were analyzed using SPSS version 11. Unpaired t-test and Chi² test were used. Data were expressed as mean ± SD. Values ≤ 0.05 were considered significant.

RESULTS

Primigravidas with singleton pregnancy between 37 and 42 weeks gestation were

included in the study. Results of the current study presented in the following tables:

1.863 and 41.825±1.557 in Group-I and Group-II respectively, and this difference was statistically significant (p=0.001).

The operative time ranged between 20.0 and 60.0 min with a mean of 36.912 ±

Table (1): Operative data.

Data		Group I (n=30)	Group II (n=30)	Sig.
Operative time (min)	mean±SD	36.912±1.863	41.825±1.557	< 0.001
	min-max	20.0 – 45.0	35.0 -60.0	

There was a statistically significant higher scar thickness in group II (24.583±1.059) compared to group I (23.443±2.489) (p=0.001).

significant in favor of the modified uterine stitch group (group II).

The mean intra operative blood loss was 828.122 ± 51.462 ml and 746.252 ± 37.966 ml (p 0.001) in group I and II respectively which were statistically

Fifteen (50%) patients needed additional sutures in group I and four (13.33%) patients needed additional sutures in group II, and this difference was statistically significant (p=0.04) in favor of the modified uterine stitch group (group II).

Table (2): Outcome measures.

Parameters		Group I (n=30)	Group II (n=30)	Sig.
Scar thickness (mm)	mean±SD	23.443±2.489	24.583±1.059	0.001
	min-max	15.0 – 25.0	20.0 - 28.0	
Blood loss (ml)	mean±SD	828.122±51.462	746.252±37.966	0.001
	min-max	150.0 – 1500.0	180.0 -1100.0	
		n (%)	n (%)	
Additional suture		15 (50%)	4 (13.33%)	<0.01

DISCUSSION

Modified two layers closure consists of full thickness closure by interrupted horizontal mattress sutures in first layer followed by a continuous running suture in the second layer. To assess the healing of scar and the risk of uterine rupture in a subsequent pregnancy, ultrasonography is used in the evaluation of uterine scar in the third trimester (*Hamar et al., 2012*) and the postpartum period (*Osser et al., 2012*).

Results of the current study showed that operative time ranged between 20.0 and 60.0 min with a mean of 36.912 ± 1.863 and 41.825 ± 1.557 in the Group-I and Group-II respectively, and this difference was statistically significant. The mean intra operative blood loss was 828.122 ± 51.462 ml and 746.252 ± 37.966 ml in group I and II respectively which were statistically significant in favor of the modified uterine stitch group (group II).

Similar to our results, *Shakila et al. (2011)* found that estimated blood loss in modified double layers closure group (542 ± 42.258) was significantly low as compared to double layers group (587 ± 49.97).

Also, *Jabbar et al. (2012)* found that the mean intra operative blood loss was 1035.83 ± 213.51 ml and 694.00 ± 184.52 ml.

Results of the current study showed that there was a statistically significant higher scar thickness in group II (24.583 ± 1.059) compared to group I (23.443 ± 2.489).

Similar to our results, *Yazicodlu et al. (2015)* found that, by selecting full thickness suturing technique including decidua, one may significantly lower the

incidence of incomplete healing of uterine incision after cesarean section.

Prior efforts with ultrasonographic evaluation of uterine scar have focused on antepartum assessment and less on postoperative evaluation of cesarean incision repair stratified by closure technique. Investigators have elucidated natural history of scar thickness in women with a prior uterine scar (*Gotoh et al., 2014*), and found a correlation between ultrasonographic and clinically determined thickness at cesarean delivery (*Tanik et al., 2015*). Other investigators have found that antepartum uterine scar thickness inversely correlates with risk of intrapartum rupture (*Rosenberg et al., 2013*), and that antepartum assessment can predict term intrapartum uterine rupture with a high degree of accuracy (*Cheung, 2015*).

Results of the current study showed that fifteen (50%) patients needed additional sutures in group I, and four (13.33%) patients in group II. This difference was statistically significant in favor of the modified uterine stitch group (group II). Similar to our results, *Shakila et al. (2011)* added hemostatic sutures at the discretion of the operating surgeon, and the number of the additional sutures was recorded. They found in only 2 (6.6%) of modified two layers closure cases that it is necessary to use additional hemostatic sutures, compared with 10 (33%) of the two layers closure group. *Jabbar et al. (2012)* found that the need for extra hemostatic sutures occurred in 16.9% vs 3% of patients.

A proposed pathophysiology is that predominant transverse orientation of muscle fibers in lower uterine segment is the reason of success of this new technique. As most of the obstetricians

must have experienced that continuous suturing in already thinned out lower segment leads to cutting through the suture line, creating holes. In this modified two layers closure technique, interrupted horizontal mattress sutures in first layer so that transverse thinned out muscle fibers were repaired in a better way. This technique creates little tension on suture line and being interrupted hampers the vascularity less and hence promotes healing. The second layer of continuous running sutures folds the muscle over the first layer so preventing the first layer to get loose during involution (*Diamond et al., 2017*).

In conclusion, change in suturing technique affected the thickness of uterine scar as detected by ultrasonography in post partum period and risk of scar dehiscence in next pregnancy. Scar thickness significantly increased with modified two layers closure when compared with traditional two layers closure of lower transverse uterine incision.

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دراسة مقارنة لتقييم ندبة الرحم بعد إغلاق الرحم بطبقة مزدوجة معدلة مقابل طبقة مزدوجة أثناء الولادة القيصرية

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خلفية البحث: تقليدياً، يتم إغلاق شق الرحم بطبقة مزدوجة، وقد تم تعديل إغلاق الرحم بطبقة مزدوجة معدلة بعمل إغلاق كامل لسمك الرحم فى الطبقة الأولى تليها خياطة متصلة فى الطبقة الثانية. ولتقييم شفاء الندب وخطر تمزق الرحم فى الحمل اللاحق، يتم إستخدام الموجات فوق الصوتية فى تقييم ندبة الرحم.

الهدف من البحث: تقييم ندبة الرحم بعد التعديل فى إغلاق الرحم بواسطة طبقة مزدوجة معدلة مقابل إغلاق الرحم بطبقة مزدوجة.

المرضى وطرق البحث: أجريت هذه الدراسة على ملاحظة المرضى الذين خضعوا لعملية قيصرية لأسباب مختلفة، وقد تم إختيار ٦٠ إمراة من الحوامل عن طريق أخذ عينات عشوائية، وتم تقسيمهن إلى مجموعتين متساويتين للطريقتين.

وخضع جميع المرضى لما يلي:

التاريخ المرضى، والفحص الإكلينيكى الكامل، والعملية القيصرية، و بعد مرور ثلاثة أشهر خضعت جميع النساء للفحص بالموجات فوق الصوتية عبر المهبل.

نتائج البحث: أظهرت نتائج الدراسة الحالية أن الوقت المنطوق تراوح بين ٢٠ - ٦٠ دقيقة بمتوسط $1,863 \pm 36,912$ و $1,557 \pm 41,825$ فى المجموعة الأولى والمجموعة الثانية على التوالي وهذا الفرق ذو دلالة إحصائية.

وأظهرت نتائج الدراسة الحالية أن فقدان الدم كان ذو دلالة إحصائية لصالح المجموعة الثانية. وأظهرت نتائج الدراسة الحالية أن الزيادة فى سمك الندبة كان له دلالة إحصائية فى المجموعة الثانية مقارنة مع المجموعة الأولى.

وقد إحتاج خمسة عشر (٥٠%) من المرضى إلى خياطة إضافية فى المجموعة الأولى وأربعة (١٣,٣٣%) من المرضى بحاجة الغرز فى المجموعة الثانية. وهذا الإختلاف كان ذو دلالة إحصائية لصالح المجموعة الثانية.

الإستنتاج: ندبة الرحم بعد إغلاقه بطبقة مزدوجة معدلة أكثر سمكا منها بعد إغلاقه بطبقة مزدوجة.