

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20202726>

Original Research Article

Effectiveness of modified mattress suture closing technique over conventional lower segment caesarean section closing technique

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Received: 25 April 2020

Accepted: 29 May 2020

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ABSTRACT

Background: The objective of this study was to compare the thickness of the scar and relative thinning of the uterine wall following conventional LSCS closing technique versus new closing technique (modified mattress Suture) and any additional surgical procedure in each group.

Methods: A total of sixty patients undergoing primary caesarean for obstetric indications and who were willing for the study were included. In 30 patients uterus was closed by conventional double layer technique (the first layer is suturing with absorbable suture in a continuous running fashion. After first layer is complete, a second continuous stitch is used to invert the first layer, inverting stitch may be horizontal or vertical using same suturing material) and in 30 patient uterus was closed by new modified mattress technique. In both groups same suture material (vicryl 1-0) was used. Measurement of the thickness of scar site and corresponding posterior wall thickness was done following 6 months of caesarean section.

Results: The possible parameters of better technique i.e., the mean scar thickness is more and relative as well as percentage thinning is less with this new technique of uterine closure although statistically not significant.

Conclusions: Modified mattress suture technique is a single step procedure and gives the feel of double layer uterine closure. Hence the time taken, material. Used and the cost involved will be less along with excellent hemostasis.

Keywords: Closure techniques, Lower segment caesarean section, Scar thickness, Trial of labor after caesarean

INTRODUCTION

Caesarean section is one of the oldest and most commonly performed surgical procedures in the history of surgery, and has become a much safer procedure. However, it confers an increased risk of complications in present as well as future pregnancies due to scar in the uterus. One and only specific risk factor involved in a post caesarean pregnancy is the fear of scar rupture. Closure of the uterine incision is a key step in caesarean section, particularly given the increasing awareness of future scar dehiscence. It is imperative therefore, that the optimal surgical technique be employed to minimize the morbidity in both the present case and in any future deliveries. Despite this, there is no universally accepted technique for performing caesarean section 1 to have a

best scar which can withstand the stress of labor in future pregnancy.

It would seem prudent to consider a woman's reproductive ambitions in determining the correct uterine closure approach to have a safe vaginal delivery. However, if a technique can give a scar without thinning or minimal thinning at the incision site of uterus, it would become an ideal suturing technique for uterine closure. Probably an anatomically proper closure of the incision on the uterus would prevent the uterine scar dehiscence in future pregnancies as suggested in the new technique of uterine closure (modified mattress suture).¹

With the current rate of scar rupture and past decade's data, it appears achievable to have scar which can

withstand the stress of labor with improvement in scar quality.

METHODS

The present study was conducted in department of obstetrics and gynecology, Command Hospital Air Force, Bangalore in 60 patients during the period of September 2013 to April 2015, the women were selected according to the following criteria.

Inclusion criteria

- LSCS elective or emergency for the first time.

Exclusion criteria

- Post any other surgery on uterus.

The cases were divided into two groups Thirty patient each with conventional LSCS uterine closure and new modified mattress suture, all patient was followed up post caesarean six weeks and six months for post-natal review and TVS for scar assessment at six months respectively.

Trans vaginal sonography using 5 MHz transducer was used for study. First, the maternal bladder is emptied before initiating the examination. With real time image in view, the transducer is gently advanced in to the anterior vaginal fornix until lower segment and internal os of cervix is visualised. The image is enlarged to fill at least two third of the ultrasound screen.

The examiner first identifies the anterior lower segment and different echogenicity of the scar identified. Identify the thickness of adjacent unscarred area and compare with corresponding posterior wall area, if asymmetric, thin anteriorly and thicker posteriorly, excessive probe pressure is likely.

The examination is performed over at least 3 to 5 minutes, allowing time after the probe swing laterally maintaining same axis seeing scar continuously. And three measurement have been obtained, the shortest of these is chosen and recoded as the shortest best. Reporting the average and the range of scar thickness measurement may not be useful and may be misleading. Choosing the shortest of the three excellent images reduce interobserver and interobserver variation.

Statistical analysis

SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1, Systat 12.0 and R environment ver. 2.11.1 was used. Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD (min-max) and results on categorical measurements are presented in number (%). Significance is assessed at 5% level of significance. The following assumptions on data is made.

Assumptions

Dependent variables should be normally distributed, samples drawn from the population should be random, cases of the samples should be independent

Student t-test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (inter group analysis) on metric parameters. LevenIs test for homogeneity of variance has been performed to assess the homogeneity of variance.

Chi-square/Fisher exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

RESULTS

The majority of subjects were in the age groups of 20-35 years. Mean age was 26.40±4.47 years and 25.90±3.64 years for conventional and modified mattress technique of uterine closure respectively, when sample age was matched p=0.637.

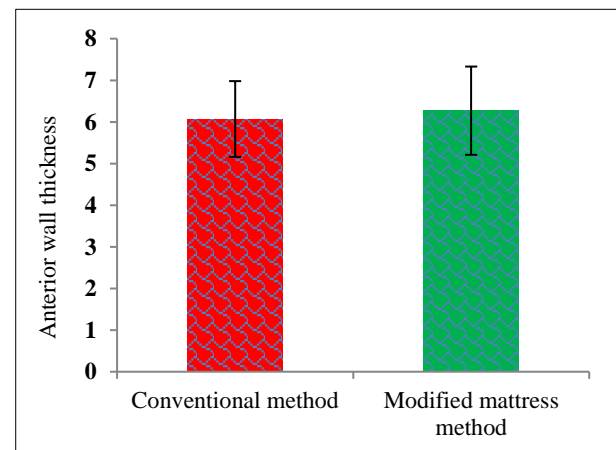


Figure 1: Comparison of study variables in two groups studied with anterior wall thickness.

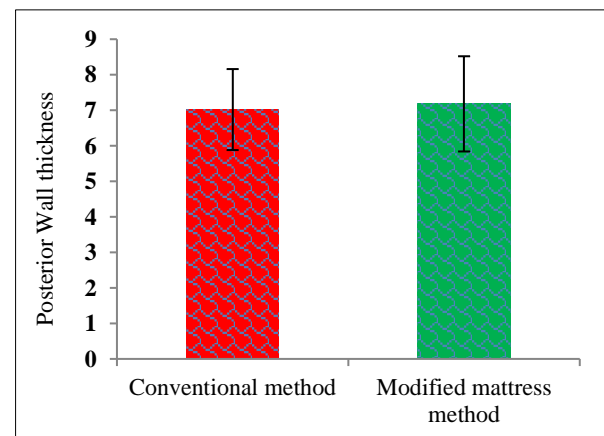


Figure 2: Comparison of study variables in two groups studied with posterior wall thickness.

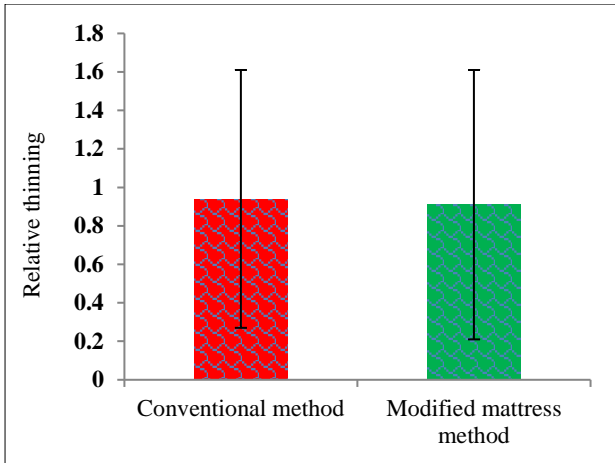


Figure 3: Comparison of study variables in two groups studied with relative thinning.

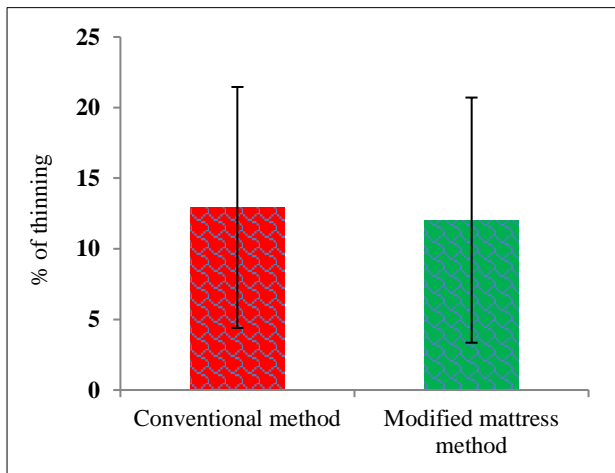


Figure 4: Comparison of study variables in two groups studied with percentage of the thinning.

From the present study scar thickness 3.6-4.5 mm, 4.6-5.5 mm, 5.6-6.5 mm, 6.6-7.5 mm and >7.6 mm for conventional and modified mattress technique are 6.7%, 16.7%, 40%, 33.3% and 6.7%, 13.3%, 33.3%, 36.7%, 10% respectively.

Posterior wall thickness equidistant to scar from internal os in the range 3.6-4.5 mm, 4.6-5.5 mm, 5.6-6.5 mm, 6.6-7.5 mm and >7.6 mm for conventional and modified mattress technique are 0%, 10%, 16.7%, 46.7%, 26.7% and 3.3%, 10%, 13.3%, 36.7%, 36.7% respectively.

Relative thinning of conventional and modified mattress study group with <1 mm, 1-2 mm, >2 mm is 53.3%, 40%, and 6.7% and 56.7%, 40%, 3.3% respectively.

Percentage of thinning distribution in two groups study with <10%, 10-20% >20% of conventional and modified mattress study group with 36.7%, 50%, 13.3% and 46.7%, 33.3%, 20% respectively.

Comparison of study of variable of conventional and modified mattress study group in respect to;

- Anterior wall thickness 6.07±0.91 and 6.27±1.06 with p=0.432.
- Posterior wall thickness 7.02±1.14 and 7.18±1.34 with p=0.610.
- Relative thinning 0.94±0.67 and 0.91±0.70 with p=0.838.
- Percentage of thinning 12.93±8.53 and 12.03±8.68 with p=0.685.

As shown in the Figure 1-4, the possible parameters of better technique i.e. The mean thickness i.e. 6.27±1.06 is more while relative thinning, percentage of thinning is less with the new technique of uterine closure although statistically not significant.

DISCUSSION

Current recommendations of the American College of obstetricians and gynecologists for selecting appropriate candidate for selecting appropriate candidates are; clinically adequate pelvis, no other uterine scars or previous rupture, physician immediately available throughout active labor capable of monitoring labor and performing an emergency cesarean delivery.² Availability of anesthesia and personnel for emergency cesarean delivery the low-transverse uterine incision can be sutured in either one or two layers.

Whether the risk of subsequent uterine rupture is affected by these is unclear. Chapman and Tucker and their associates found no relationship between a one- and two-layer closure and the risk of subsequent uterine rupture.^{3,4} And although Durnwald and Mercer also found no increased risk of rupture, they reported that uterine dehiscence was more common after single-layer closure.⁵ In contrast, Bujold and co-workers, found that a single-layer closure was associated with nearly a fourfold increased risk of rupture compared with a double-layer closure.⁶ In response, Vidaeff and Lucas, argued that experimental models of wound healing have not demonstrated advantages of a double-layer closure.⁷ Because of potentially confounding variables inherent in this type of retrospective study, they concluded that the evidence is insufficient to routinely recommend a double-layer closure.

Sharma C et al, further reconfirm the available evidence regarding usefulness and efficacy of sonographic evaluation of lower uterine segment and myometrium for safely predicting the outcome of TOLAC.⁸ Also reaffirm the view of ACOG regarding TOLAC in women with previous cesarean section. With different cut of value for critical value of thickness of LUS and myometrium in different study, as the benefit of successful of TOLAC in term of maternal and neonatal benefit.⁹⁻¹¹

It is clear that, the fear and controversies for so many years is answered by only one word that is scar that can 'withstand' the stress of labor in lower segment.

CONCLUSION

Authors conclude that conventional method and modified mattress technique of uterine closure are though similar in outcome in uterine thickness of scar. Modified mattress is new technique and no one is having as experience as in conventional method. Hence, with the experience and more randomized controlled trials only will prove which method is superior.

Modified mattress is single step procedure give the feel of double layer. Hence the time taken, material used is less. It also avoids inadvertent taking of decidua while closing uterus and give good haemostasis

Opening of uterus by clean extra membranous incision (central incision by surgical blade and extension of incision by scissor with guard finger underneath) is giving better cut margin and better visualization of tissue which will help in better approximation while suturing for closing uterus and may give better scar quality.

In low-income countries or otherwise, maternal; anemia compound to complex maternal morbidity. Any attempt to keep low costing and to keep blood loss minimum with better wound that withstand future stress of labor for TOLAC would be a substantial intervention.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Babu KM, Magon N. Uterine closure in cesarean delivery: A new technique. North Am J Med Sci. 2012;4:358-61.
2. American College of Obstetricians and Gynecologists: vaginal birth after previous caesarean delivery. Practice Bulletin No. 54; 2004.
3. Chapman SJ, Owen J, Hauth JC. One- versus two-layer closure of a low transverse cesarean: The next pregnancy. Obstet Gynecol. 1997;89:16.
4. Tucker JM, Hauth JC, Hodgkins P, Owen J, Winkler CL. Trial of labor after a one-or two-layer closure of a low transverse uterine incision. Am J Obstet Gynecol. 1993;168:545.
5. Durnwald C, Mercer B. Uterine rupture, perioperative and perinatal morbidity after single-layer and double-layer closure at cesarean delivery. Am J Obstet Gynecol. 2003;189:925.
6. Bujold E, Bujold C, Hamilton EF, Harel F, Gauthier RJ. The impact of a single-layer or double layer closure on uterine rupture. Am J Obstet Gynecol. 2002;186:1326.
7. Vidaeff AC, Lucas MJ. Impact of single- or double-layer closure on uterine rupture. Am J Obstet Gynecol. 2003;188:602.
8. Sharma C, Surya M, Soni A, Soni PK, Verma A, Verma S. Sonographic prediction of scar dehiscence in women with previous cesarean section. J Obstet Gynaecol India. 2015;65(2):97-103.
9. Rozenberg P, Gopffinet F, Philippe HJ, Nisand I. Ultrasonographic measurement of lower uterine segment to assess risk of defect of scarred uterus. Lancet. 1996;347:281-4.
10. Jastro N, Chaillet N, Roberge S, Morency AM, Lacasse Y, Bujold E. Sonographic lower uterine segment thickness and risk of uterine scar defect: a systemic review. J Obstet Gynecol Can. 2010;32:321-7.
11. Gizzo S, Zambon A, Saccardi C, Patrelli TS, Di Gangi S, Carrozzini M, et al. Effective anatomical and functional status of the lower segment at term; estimating the risk of uterine dehiscence by ultrasound. Fertil Steril. 2013;92(2):496-501.

Cite this article as: Singh CP, Pitale DL. Effectiveness of modified mattress suture closing technique over conventional lower segment caesarean section closing technique. Int J Reprod Contracept Obstet Gynecol 2020;9:2882-5.