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## A comparative study of single layer running lock Vs conventional multilayer repair in lower segment transverse incision during caesarean delivery

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### Abstract

**Aims and objectives:** Avoidances and /or reduction of multilayer repair associated complications including operative blood loss reduction thereby reducing the maternal morbidity at a low cost.

**Methods and Material:** In the Department of G&O, I.P.G.M.E&R-S.S.K.M.H, Kolkata West Bengal, India.

This study was conducted after proper assessment and selection and planned more than 200 (two Hundred) patients for LSCS which were duly randomized and allocated more than 100(Gr-A) patients for single layer and more than 100(Gr-B) patients for multilayer closure.

**Results and Analysis:** The results of individual group were analyzed in the form of primary outcome\* and secondary outcome\*\*or short term and long term\*\*\* basis suggest single layer closure is beneficial and superior in all aspects.

**Conclusion:** The health care facilities should consider a change in practice to enjoy its beneficial effects required some education and training to ensure to perform it.

**Keywords:** Lower segment transverse wound –single layer running lock closure-minimal complications

### Introduction

The global survey of WHO show that Caesarean delivery rate gradually increased (33% Institutional, 51% Private hospital) and surgery related complications of the mother and the baby are also increased. Considering the above said fact, as the surgery is performed so frequently, attempt to reduce risk associated with it, is likely to yield significant benefits in terms of costs and better health outcome in women.

Whether multilayer closure of uterus is better than single layer is debatable. Yet there is no compelling evidence that conventional multi- layer closure is better than single layer closure, rather due to too much needle insertion, with too much tissue necrosis, too many perforations of elongated sinuses with subsequent hematomas formation and more hemorrhagic complications with high morbidity and cost in respect of antibiotics, analgesics, sutures and hospital stay. At the same time as per “Joel-Cohen based” technique single layer closure is simple requires less operation time, less febrile morbidity, less requirement of antibiotics, analgesics and suture materials, with less hemorrhagic complications which requires blood transfusion and ultimately less maternal morbidity in terms of primary and secondary outcomes. In this study we were carried out and statistically established single layer closure is superior to multilayer repair of uterine incision.

### Methods and Materials

In the said Institution, in said department total more than 200 (two hundred) patients after properly assessed and planned for Caesarean Delivery in this study which is designed as follows:(As Per Consort-Flow Chart-Figure-1).

### Indication of LSCS

1. Post caesarean pregnancy (21)
2. Dystocia (10)
3. Elective (10)
4. Fetal distress (abnormal CTG) (20)
5. Prolonged pregnancy with failed induction (15)
6. Breech (10)

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7. Multiple Pregnancy (4)
8. APH (10). The analysis of individual groups are done in the form of primary outcome and secondary outcome.

**Exclusion Criteria:**

- 1) Bleeding disorders, chronic diseases.
- 2) Infective association – HIV, HBsAg infection and others.
- 3) Bad obstetric history. Smoking addiction.
- 4) Developmental malformed uterus, malformed fetus.
- 5) Connective tissue and immunological disorders in pregnancy.

**Results and analysis:** The analysis of individual group and outcome defined as primary outcome and secondary outcome calculated and tabulated in table- 1 and table-2 with statistical significant calculated as per Graph Pad Software. The result of primary outcome\*, secondary outcome\*\*or short term and long term\*\*\* basis suggested single layer is superior (\*No serious complications, Organ damage/failure and significant blood loss which requires blood transfusion) (\*\*Less operation time, febrile illness, mobilization time, fluid/food intake time, anemia, wound complications, analgesic requirements) (\*\*\*) Wound and Scar, readmission, hospital stay, Cost less with better outcome.).

**Table 1: Primary Outcomes.**

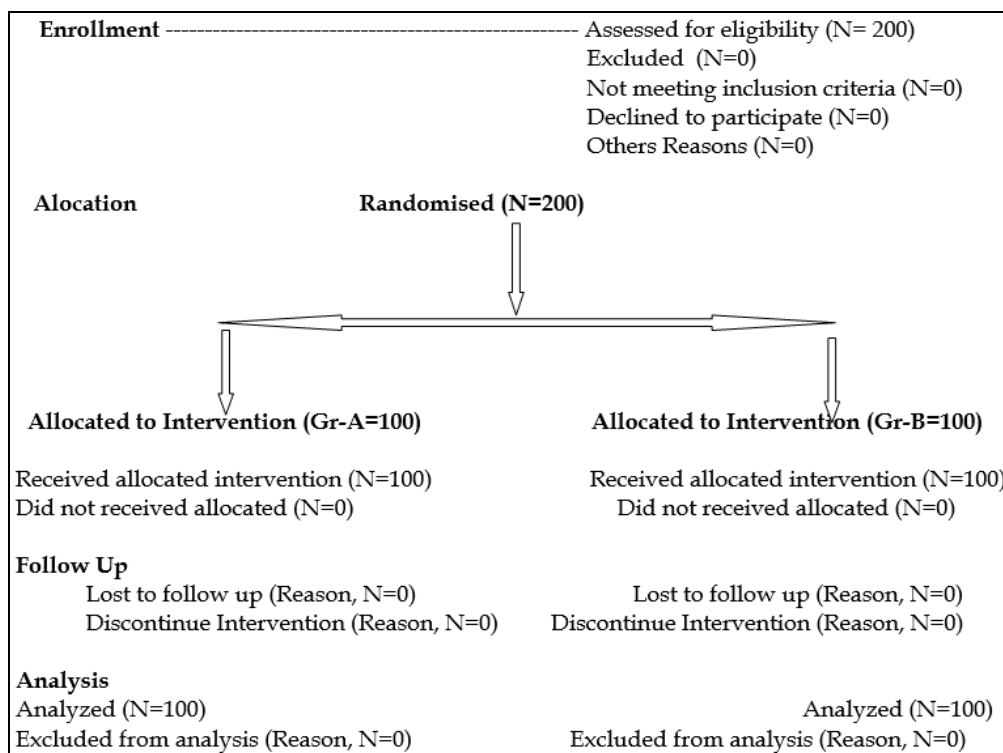
Indicators	Group A (n=100)	Group B (n=100)	p Value	Reference
Organ damage/failure	9(stained urine)	20(stained urine)	0.04	Fisher's Exact Test
Blood loss (pre and post op. Hb%). PCV Drop	*0.4,*0.05,*0.005. *1.8,*0.1,*0.014	*0.9,*0.05,*0.005. *2.7,*0.05,*0.0071.	p<0.0001 p<0.0001	Unpaired t test Unpaired t test
Blood transfusion required	15	37	0.006	Fisher's Exact Test

\*Mean,\*SD,\*SEM.

**Table 2: Secondary Outcomes.**

Indicators	Group A(n=100)	Group b(n=100)	p Value	Reference
Operation time	*30,*10,*1.	*45,*15,*1.5.	P<0.0001	Unpaired-t-test
Angle hematoma	12	32	P=0.0010	Fisher's Exact Test
Stitch line hematomas	10	36	P<0.0001	Fisher's Exact Test
Approximation failure	11	34	P=0.0002	Fisher's Exact Test
Stitch whole injury	14	30	P=0.0099	Fisher's Exact Test
Cut through and avulsion	7	24	P=0.0007	Fisher's Exact Test
Mobilization time	*12,*2,*0.2.	*18,*2,*0.2.	P<0.0001.	Unpaired-t-test
Oral feeding time	*12,*2,*0.2.	*18,*2,*0.2.	P<0.0001.	Unpaired-t-test
Pain and satisfaction	*14,*2,*0.2.	*38,*3,*0.3.	P<0.0001.	Unpaired-t-test
Analgesic needs	*18,*2,*0.2.	*36,*2,*0.2.	P<0.0001.	Unpaired-t-test
Febrile complication	5	20	P=0.0022	Fisher's Exact Test
Wound complication	6	23	P=0.0010	Fisher's Exact Test
Re- admission	1	5	NA	NA
Hospital stay	*7,*2,*0.2.	*10,*2,*0.2.	P<0.0001.	Unpaired-t-test
Costs(sutures and medications)	≤3sutures/case and less medications	≥5sutures/case and more medications	NA	NA

\*MEAN,\*SD,\*SEM.



**Fig 1: Consolidated standards of reporting trails (consort) statement**

## Discussion

A continuous locking single layer closure required few additional haemostatic sutures and less operation time without any short term detrimental effects with follow up not significantly affecting the maternal and fetal complications in the next pregnancy [1, 2, 3].

No uterine rupture or demonstrable increased scar rupture in single layer compare to double layer in those women who underwent trial of labour [4, 5]. The Misgav-Ladach technique single layer closures reported 20% reduced blood loss, 50% reduction of suture materials, low febrile morbidity (77%), reduction of antibiotics (33.3%) and lower adhesions (6.3%) [6, 7]. So far as complications are concerned, bladder lacerations (1.4/1000), ureteric injuries (0.3/1000) [8], wound complications (>1.3%), shock and blood transfusions, endometriosis (11-13%) [9] and ultimately maternal mortality (2.2/lakhs pregnancy) [10].

The results and analysis of our study in respect of primary outcome of single layer closure (Gr A=100) less organ damage/failure. (Stained urine)(p=0.04) less blood transfusion required (p=0.006.) and less hemoglobin drop (p<0.0001.).

The secondary outcome on short term basis of single layer closure show less operation time (P<0.0001), less febrile complications (P=0.0022) with early mobilization (P<0.0001), early fluid intake (P<0.0001) required less analgesic to relieve pain and satisfaction (p<0.0001) and wound complications (P=0.0010.).

In our study the intra operative events (which were not previously measured) of single layer closure shows less angle hematomas (P=0.0010), stitch hole injury (P=0.0099), stitch line hematomas (P<0.0001), approximation failure (P=0.0002) and cut through with avulsion (P=0.0007).

The secondary outcome on long term basis of single layer closure showing less readmission, less hospital stay (P=0.0010), and low costs (includes suture materials, antibiotics, other medications).

## Conclusions

The evidences from this study suggests that the effects of Joel Cohen based technique with single layer running lock closure is beneficial than others. In institution, to consider such type of practice, some education and training of health care staff would be necessary to ensure that health care workers have the skills to identify intra operative and short-long term complications.

**Contribution of authorship:** All authors contributed to design, literature reviewed and writing of article.

**Ethics approval:** This is duly approved by Institutional Ethics Committee.

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