CLOSURE OF LOWER SEGMENT CAESAREAN INCISION IN SINGLE LAYER - A SAFE TECHNIQUE.

NABENDU BHATTACHARJEE ● SUBHAS CHANDRA BISWAS
BIPLAB PAUL ● ANIL KUMAR MAITY

SUMMARY

A total of 350 women during the period from April 1994 to December 1996, were prospectively selected (randomised) for either a one-layer (n=178) or a two-layer (n=172) closure of the lower segment transverse uterine incision with either No. 1 chromic catgut or No. 1-0 vicryl. Indications for C.S.,various demographic and antenatal characteristics were similar in both groups so also the intrapartum and intraoperative characteristics. On analysing the outcome of the two groups we found the one-layer closure of uterine incision had the benefits that it required less operative time, less suture material and lesser No. of extra hemostatic sutures. Post-operative outcome were similar in both groups with a little less incidence of puerperal sepsis in single-layer group. Subsequent follow-up by clinical examination, U.S.G. and H.S.G. in selected cases did not show any difference in uterine involution and nature of the healed uterine scar.

INTRODUCTION

Caesarean section is the commonest major surgical procedure in modern days practice with a disputed history of origin. Initially all the uterine incisions were classical ones and left open without being sutured until in 1882 Max Sanger recommended immediate closure of all uterine incisions. In 1912 Kronig described a caesarean delivery through a lower seg-

Dept of Obs & Gyn., NRS Medical College & Hospital, Calcutta

ment vertical incision which was later modified by Munro Kerr in 1926 into a more practical transverse incision and both of them recommended a two-layer closure of the uterine incision. Subsequent recommendations by various authors varied only with regard to the use of a continuous (locking/non-locking) or interrupted suturing techniques. One-layer closure of lower segment incision was first advocated by Pritchard et al in 1976. They recommended that the first layer be running and locked and if approximation of the cut edges is not satisfactory after a single-layer continuous closure then another layer may be placed. Hauth et al (1992) reviewed 457 women who had one-layer closure of uterine incision and found that a one-layer closure technique is highly acceptable.

AIMS AND OBJECTS

A single-layer closure of lower segment transverse incision theoretically disrupts less tissue, introduces less foreign (suture) materials, requires less operative time, achieves hemostasis more effectively and has less post-operative infectious complications. We tested these hypothesis by analysing the selected outcomes of 350 women who were prospectively randomised to closure of L.S. transverse uterine incision with either a single layer of continuous locked suture or two continuous layers with the first layer locked.

SUBJECTS AND METHODS

A total of 350 women during the period from April 1994 to December 1995 were prospectively selected for either a one-layer (n = 178)

TABLE I

Technique of Closure.	Total No.	Suture Material No. 1 Chr. catgut with eyed needle.	No. 1 Chromic atraumatic catgut (40mm. 1/2 circle needle.	No. 1-0 vicryl with 40mm. 1/2 circle needle
One-layer Closure	168 (178-10)	42	58	68
Two-layer Closure	182 (172+10)	50	60	72

Showing No. of women in each catagory with the types of suture material used.

or a two-layer (n = 172) closure of the lower segment transverse uterine incision with either No. 1 chromic catgut or No. 1-0 vicryl. Ten women who were randomised prospectively for a single layer closure were subjected later to a two-layer closure due to anatomical reason (thick edges) or non-satisfactory approximation. Table I shows the No. of women in each catagory with the type of suture material used. The indications for C.S. were almost similar in two groups as presented in Table II. Table III represents the various demographic and antepartum characteristics which were similar in both groups.

RESULTS & ANALYSIS

Intrapartum and intraoperative characteristics of the two groups of women were also almost similar as presented in Tables IV & V.

TABLE II
INDICATIONS FOR C.S.

Indication	One-layer Group (n=168)	Two-layer Group (n=182)
Intrapartum fetal distress	30	34
Non-progress of Labour	14	16
Failed induction	28	30
Previous C.S. : One	28	28
Two	10	10
Abnormal fetal presentation.	12	15
Cephalo-pelvic disproportion	9	9
Placenta Praevia	8	10
Severe Pre-eclampsia	15	15
Eclampsia	4	4
Others (Elderly primi, BOH, long period of infertility, Diabetes etc.)	10	11
Total	168	182

TABLE III

Characteristics	One-layer Group (n=168)	Two-layer Group (n=182)
Age		
a) Below 20	16(9.5%)	17(9.3%)
b) 20-30	132(78.5%)	143(78.7%)
c) Above 30	20(11.9%)	22(12%)
Parity		
a) Nullipara	86(51.2%)	92(50.5%)
b) Multipara	82(48.8%)	90(49.5%)
Built		
a) Slim/average	88(52.4%)	96(52.7%)
b) Obese	80(47.6%)	86(47.3%)
Singleton Pregnancy	164(97.6%)	178(97.8%)
Period of Gestation (Wks.)		
a) Below 37	8(4.7%)	9(5%)
b) 37 to 39	78(46.5%)	86(47.3%)
c) Above 39	82(48.8%)	87(47.7%)
Hb level		
a) 80% or above	98(58.3%)	110(60.4%)
b)Below 80%	70(41.7%)	72(39.6%)
Hypertensive Disorder	30(17.8%)	34(18.7%)
APH	9(5.3%)	10(5.5%)
PROM	11(6.5%)	13(7.1%)

Showing various demographic and antenatal characteristics of the patients.

ANALYSIS OF OUTCOME

Prospective outcome included the followings :-

a) Time required for the closure of uterine incision.

b) Length of suture material used for the closure of uterine incision.

c) Need for extra hemostatic sutures.

d) Blood loss-requirement for blood transfusion.

e) Decrease of Hb. level 48 Hrs. after operation.

f) Post-operative infection :-

i) Wound infection.

ii) Puerperal sepsis.

Table VI presents the outcome of the two groups (one-layer closure vis-a-vis two-layer closure). The one-layer closure of uterine incision had the benefits that it required less operative time, less suture material and lesser No. of extra hemostatic sutures. Post-operative outcome were similar in both groups with a little less incidence of puerperal sepsis in women who had a one-layer clossure.

Of the 10 women who were prospectively randomised for a single-layer closure but had a two-layer closure during operation, 6 (all having elective C.S.) had thick cut edges which preclude a one-layer closure (3 women had C.S. before 37 completed wks. and the remaining 3 between 37 and 39 completed wks. of gestation). 4 women required a second layer of suture because of unsatisfactory approximation of the cut edges and these happened during the early period of this study due to inexperience of surgeons. Attention to the proper technique of making the low transverse incision

TABLE IV
INTRAPARTUM CHARACTERISTICS OF THE 350 WOMEN

Characteristics	Single-layer Group (n=168)	Two-layer Group (n=182)
Labour :-		
a) None	52(30.9%)	62(34.1%)
b) Spontaneous	88(52.4%)	90(49.5%)
c) Induced	28(16.7%)	30(16.4%)
Oxytocin in Labour (Induced + Augmented)	102(67.1%)	110(60.4%)
Average Cervical dilation at C.S.	4 Cm.	4 Cm.
Av.duration of Memb. rupture (hr.)	18	17
Received antibiotic in Labour.	90(53.5%)	96(52.7%)
Chorioamnionitis	20(11.9%)	22(12%)

TABLE V
INTRAOPERATIVE CHARACTERISTICS OF THE 350 WOMEN

Characteristics	Single-year Group (n=168)	Two-layer Group (n=182)
Anaesthesia :-		
a) General	132(78.6%)	142(78%)
b) Regional	36(21.4%)	40(22%)
Abdominal Incision :-		
a) Vertical	66(39.3%)	72(39.6%)
b) Pfannenstel	102(60.7%)	110(60.4%)
Placenta on anterior Lower Segment	4(2.4%)	5(2.7%)
Previous operative adhesions	11(6.5%)	11(6%)
Drawn-up bladder	16(9.5%)	17(9.3%)
Tubal ligation	50(30%)	50(28%)

and delivery of the baby usually resulted in a relatively equal thickness of the upper and lower edges of the uterine incision, favouring perfect closure.

Subsequent follow-up : Of the 350 women under study only 188 (96 in single-layer group and 92 in two-layer group) reported for a follow up between 6 and 8 wks. after the operation. The involution was good in both groups and there were no abnormal clinical findings. 52 of the one-layer group and 48 of the two-layer group were subjected to USG of uterus and adnexae with particular attention to the low anterior wall of uterus to see the integrity and thickness of the healed sutured area. 8 of the first group and 7 of the second group were later subjected to H.S.G. as there were some doubts regarding the uterine scar, but the hysterosalpingography did not show any abnormality (viz. herniation) of the uterine cavity at the site of the scar in them. 4 women in one-layer group and 6 women in two-layer group had a subsequent delivery till 31st July, 1996. Of them 1 in each group had vaginal delivery and others had repeat C.S. None had scar dehiscence or rupture.

TABLE VI
SELECTED OUTCOME OF A SINGLE-LAYER CLOSURE TECHNIQUE AND A TWO-LAYER CLOSURE TECHNIQUE

Facts	Single-layer Closure (n=168)	Two-layer Closure (n=182)
A. Intraoperative :-		
Extra hemostatic sutures (No. of patients)	26	35
Extra hemostatic sutures per patient who required such sutures.	1.7	1.96
Av. length or suture material used in the closure of uterine incision :-		
a) Without extra hemostatic suture	64 Cm.	86 Cm.
b) With extra hemostatic suture.	70 Cm.	93.5 Cm.
Av. time required for the closure of Ut. incision :-		
a) Without extra hemostatic suture	5 Min.	8.2 Min.
b) With extra hemostatic suture.	6.4 Min.	9.8 Min.
B. Post-operative :-		
Above 1 g% decrease of Hb. level after 48 hrs.	43(25.6%)	46(25.3%)
Required blood transfusion	5(3%)	6(3%)
Wound Infection	9(5.3%)	10(5.5%)
Puerperal Sepsis	16(9.5%)	18(10%)
Secondary PPH	5(3%)	6(3.3)%)

CONCLUSION

Thus in our study of 350 Caesarean Section we found that a two-layer closure of uterine incision was in no way superior to a one-layer closure, rather the single-layer closure had some advantages in operative time requirement, introduction of foreign (suture) material and achievement of hemostasis. Jelsema et al (1993) in their experience found the benefits of a monolayer closure of L.S. trans.ut incision and opined that a two-layer closure may in fact cause saceulation. Tucker et al (1992) concluded that closure of a lower uterine transverse incision in one layer should not preclude a trial of labour in a subsequent pregnancy because in their study of 149 such women they found no symptomatic scar rupture of adverse perinatal outcome.

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