

Membrane Sweeping for Vaginal Birth after Caesarean Section and its Outcome -A Comparative Study

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ABSTRACT

Introduction: Sweeping of membrane is a method of induction of labour. This is used to avoid prolonged labour. However, there is paucity of data about the use of this method for induction of labour and reducing prolonged labour in pregnancy with previous caesarean section. This study is an effort to find the effect of membrane sweeping in previous caesarean section.

Objective: To initiate labour in previous LSCS patients by membrane sweeping and maternal outcome.

Study setting: This prospective randomised control study was conducted in Mahatma Gandhi Medical College and Research Institute, Puducherry between January 2011 to June 2012.

Materials and Methods: Seventy five women were randomly assigned to membrane sweeping and seventy five to control. In study group serial membrane sweeping was done once weekly from 39 weeks of gestation until the onset of labour up to 41 weeks of gestation. In control group, no intervention up to 41 weeks of gestation. All the cases were monitored by biophysical profile.

Outcome measures: The primary outcomes measured were number of patients who had onset of labour. The secondary outcome included the successful vaginal delivery, number of membrane sweeping to initiate labour, sweeping to delivery interval and amount of oxytocin required.

Results: The onset of labour in study group was 61.3% similar in control group 64% with p 0.736. The mean interval from sweeping to labour onset was 50.15 ± 8 hours. The rate of VBAC was 17.3% in study group in compared to 18.7% in control group and LSCS was 82.7% in study group in compared to 81.3% in control group respectively. The mean gestation age at delivery 40 ± 0.56 weeks for study group compared with 39.92 ± 0.55 weeks for control group.

Conclusion: Although membrane sweeping is an easy way of inducing labour, present study failed to demonstrate its beneficial effect on obstetrical outcome.

Keywords: Membrane sweeping, Post term pregnancy, VBAC

INTRODUCTION

Membrane sweeping at term is effective in expediting delivery and reducing the need for formal induction of labour [1]. Recent guidance suggests that membrane sweeping can be offered at term to promote labour and avoid induction of labour for prolonged pregnancy [2,3]. A recent Cochrane meta-analysis of membrane sweeping trials concluded that it reduces the number of women progressing to post-term gestation and the need for formal labour induction [4]. Induction of labour is associated with a failed trial after vaginal birth after caesarean section (VBAC) resulting in a repeat caesarean delivery [5]. Induction of labour and scarred uterus is associated with uterine rupture which in turn massively increases the risk of neonatal mortality [6]. Induction of labour at planned VBAC is acceptable after careful counselling and risk assessment [7-9]. Clinical guidelines continue to suggest that most women with one previous caesarean delivery with a low transverse incision were the candidates for VBAC and should be counselled and offered a trial of labour [10].

There is a paucity of data within context of membrane sweeping after caesarean delivery. Promoting earlier onset of labour within term in women planning VBAC can be advantageous because the need for induction of labour may be avoided and prolongation of pregnancy further into late term with its risk of stillbirth may be reduced.

With this background it is an effort to find out the effect of serial membrane sweeping on the onset of labour in antenatal woman with previous LSCS, who wished to undergo planned VBAC.

MATERIALS AND METHODS

The study was conducted at antenatal outpatient department of Mahatma Gandhi Medical College and Research Institute during January 2011 to June 2012 after obtaining Ethical committee clearance. A total of 150 antenatal mothers who fulfil the inclusion criteria were considered (75 in study arm and 75 in control arm). Inclusion criteria were women with one previous caesarean section with non-recurrent indications, singleton pregnancy and cephalic presentation, gestational age of 39 weeks, intact membrane and candidates willing for VBAC. Exclusion criteria were multiple gestations, malpresentations, placenta praevia, abruptio placentae, suspected cephalo-pelvic disproportion, gestational diabetes, chronic or gestational hypertension, pre-eclampsia, gestational age less than 39 weeks, H/O premature ruptures of membranes, vasa praevia, congenital anomalies, any previous abortions, More than one transverse lower segment caesarean scar, Previous classical caesarean scar, any other uterine surgeries related to gynaecology. Previous LSCS patients who satisfied the inclusion and exclusion criteria were selected and their gestational age was confirmed by Naegele's rule or by ultrasonic measurement of crown rump length of the foetus during first trimester or by foetal biometry i.e. Biparietal diameter, head circumference and femur length during second trimester. Participants involved in the study were recruited after taking written informed consent and re-assigned into two groups by the sequential opening of numbered sealed opaque envelopes indicating a "sweep" or "No Sweep". In study group (sweep), for all patients bishop scoring was recorded. During vaginal examination,

if cervix admitted one finger, the foetal membranes were separated from the cervix and the lower uterine segment was far as possible by sweeping a finger through 360 degrees. When the cervix was closed attempts to stretch the cervix open or cervical massage was performed. Sweeping was done at 39 and 40 weeks. In control group (no sweep), gentle vaginal examination was done once at 39 weeks for Bishop scoring and no further examination was done till the onset of labour. All the cases were monitored by daily Non Stress Test, amniotic fluid index was measured once in every three days till onset of labour or 41 weeks. Any condition requiring immediate delivery was excluded from the study and was managed according to the institutional protocol. Primary and secondary outcomes were assessed. Outcomes measured were number of patients who had spontaneous onset of labour primarily and secondarily successful Vaginal delivery, number of membrane sweeping to initiate labour, sweeping to delivery interval, amount of oxytocin required and mean gestational age at delivery.

STATISTICAL ANALYSIS

Unpaired t-Test was used for continuous variables like age. Chi-square test was used for categorical values like parity, previous history of VBAC, augmentation with oxytocin, mode of delivery and gestational age. Student t-test was used for comparing Bishop Score. The data were analysed using SPSS 15.0. and Microsoft word and Excel were used to generate graphs, tables etc.

RESULTS

The women in study group and control were age and parity matched. They were similar for pre swiping Bishop score and not having previous VBAC [Table/Fig-1].

	Control group (n=75)	Study group (n=75)	p-value
Age in years	26.75±3.47	26.68±3.25	0.904
Parity	2.08±0.32	2.08±0.32	0.453
No history of VBAC (%)	90.6	96	0.327
Bishop Score	2.96± 0.89	2.44±0.50	0.024

[Table/Fig-1]: Patient profile

p< 0.05 is significant

In study group, 50 patients (66.7%) underwent only one sweeping of which 39 patients had onset of labour. Twenty five patients (33.3%) underwent two sweeping of which seven patients had onset of labour. So, total 46 i.e. 61.3 %, patients went into labour after sweeping. The number of patients who had spontaneous onset of labour in the control group was 48 i.e. 64%. The difference is not significant statistically. The mean interval from sweeping to onset of labour was 50.15 ± 8.65 hours.

The comparison of oxytocin requirement among the control and the study groups were 21.3% and 18.7% respectively. The oxytocin augmentations in both the groups was statistically similar and comparable. The mode of delivery among the control and study groups was studied. 18.7% and 17.3% delivered vaginally in the control and study groups respectively. Two out of 14 patients in control group and 3 out of 13 patients in study group had instrumental delivery. The Caesarean section rate among the control and study groups were 81.3% and 82.7% respectively. The mode of delivery between the two groups was statistically similar and comparable. The mean gestational age at delivery in control group and study group was 39.92 ± 0.55 and 40.00 ± 0.56 weeks respectively. The mean gestational age at delivery was statistically similar and comparable [Table/Fig-2]. The indications for repeat LSCS among the control and study groups were similar.

The Caesarean delivery rate "at maternal request" in control and study groups were 37.7% and 33.8% respectively. In the study group 21 patients underwent caesarean delivery "at maternal request". Among those 21 patients, three patients underwent LSCS after

	Control group		Study group		p-value
	No (n=75)	%	No (n=75)	%	
On set of Labour	48	64	46	61.3	0.736
Augmentation with oxytocin					
Required	16	21.3	14	18.7	0.683.
Not required	59	78.7	61	81.3	
Mode of delivery					
VBAC	14	18.7	13	17.3	0.532.
LSCS	61	81.3	62	82.7	
Gestational age at delivery					
39-40	51	68.0	38	50.7	0.410
40-41	24	32.0	37	49.3	
Mean ± SD	39.92 ± 0.55		40.00 ± 0.56		

[Table/Fig-2]: Obstetric outcome

p≤ 0.05 is significant

onset of labour and 18 patients underwent LSCS before entering into labour. Out of those 18 patients 2 underwent LSCS before 41 weeks and 16 waited till 41 weeks. In the control group, 23 patients underwent LSCS "at maternal request". Among those 23 patients, 5 patients underwent LSCS after the onset of labour and 18 patients underwent LSCS before entering into the labour. Out of those 18 patients, five underwent LSCS before 41 weeks and 13 waited till 41 weeks. The indications for LSCS due to "scar tenderness" in the control and study groups were 31.1% and 32.2% respectively. Only one participant in control group had scar dehiscence. None had uterine rupture. The indications for LSCS due to "foetal distress" in the control and study groups were 19.7% and 12.9% respectively. In the control and study groups, 11.5% and 20.9% underwent LSCS for other indications respectively. The indications were "non reassuring foetal status", "PROM" and "decreasing trend in amniotic fluid index" [Table/Fig-3].

Indication for LSCS	Control group (n=61)		Study group (n=62)	
	No	%	No	%
Maternal request	23	37.7	21	33.8%
Scar tenderness	19	31.1	20	32.2%
Fetal distress	12	19.7	8	12.9
Others	7	11.5	13	20.9

[Table/Fig-3]: Indications for LSCS

DISCUSSION

An approach to the prevention of post term pregnancy is routine induction of labour at an earlier gestational age. Post term pregnancy is associated with increased perinatal morbidity and mortality. Serial membrane sweeping is done routinely to induce labour because the perinatal morbidity and mortality starts increasing from 41 weeks of gestation or even earlier.

In the present study, the mean age of patients in the study and control group was 26.68 ± 3.25 and 26.75 ± 3.47 years respectively. In the study by Foong et al., Miranda et al., and Peng Chiang et al., the mean age of patients in the study and control groups were 32.1 ± 4.2 and 31.8 ± 4.9 , 31.0 , 30.0 ± 5.3 and 29.2 ± 5.6 years respectively. Patients in the present study were younger in comparison to the other studies [11-13].

The mean parity in study group and control group is 2.08 ± 0.32 . In study by Tan PC Subramaniam RN et al., Foong et al., and Peng Chiang et al., the mean parity in the study group and control group were 1.6 ± 0.8 , 1.0 ± 1.5 , and 1 respectively [4, 11, 13].

Women who had previous history of VBAC in control group were 9.4% and study group was 4%. All of them had successful VBAC that is 100%. In the study by, Mark B Landon, 48.9% of women had

a prior history of vaginal delivery. Among them successful VBAC was 86.6%. But this study does not mention about the successful VBAC following previous history of VBAC [14].

The mean initial Bishop Score in control group and study group was 2.96 ± 0.89 and 2.44 ± 0.50 respectively. In the study by Peng Chiong et al., Bishop Score for study group and control group was 5.1 ± 1.8 and 4.7 ± 2.0 respectively. The reason for high Bishop Score was due to its assessment after sweeping and before induction. This shows the beneficial effects of membrane sweeping in making the cervix favourable, before the induction of labour [13].

In this study, 66.7% underwent one sweeping in the study group. Onset of labour was found to be more in patients who had one sweeping. The percentage of patients who entered into labour in the two groups was 78% and 22% respectively. Similar study by Foong et al., showed that 96.3% of patients with one sweep had onset of labour. Peng Chiang Tan et al., in their study on one sweep versus multiple sweeps, showed that less operative delivery in the later group [11,13].

The onset of labour in control group and study group was almost similar, that is 64% and 61.3% respectively. But in the study by Miranda et al., showed higher onset of labour in sweeping than that of no sweeping group, that is 68% versus 54%. The low rate of labour initiation in the present study was due to opting out of the patient from the study in favour of LSCS at maternal request before 41 weeks of period of gestation. The mean interval from sweeping to labour onset was 50.15 ± 8 hours. In the study by Miranda et al., the mean interval from sweeping to onset of labour was within 48 hours, which is comparable [12].

The patients augmented with oxytocin in control and study groups were 21.3% and 18.7% respectively. Similarly, in the study by Miranda et al., the oxytocin augmentation in control group and study group was 15% and 14% respectively. But in the study by Peng Chiong Tan et al., the percentage of patients augmented with oxytocin in the study and control groups were 35% and 40% respectively. The higher oxytocin requirement was due to higher maternal age [12,13].

When mode of delivery was considered, 18.7% in control group and 17.3% in study group delivered vaginally, and 81.3% and 82.7% underwent LSCS. In the study by Peng Chiong Tan et al., the mode of delivery in the study and control groups were 78% and 69% respectively, delivered vaginally and undergone LSCS were 22% and 31% respectively. But the study by Miranda et al., found 90% delivered vaginally and 10% undergone LSCS in both groups. In another study by Foong et al., the mode of delivery in the study and control groups were 85.2% and 91.4%, delivered vaginally and undergone LSCS were 3.7% and 5.7% respectively. The high rate of LSCS in the present study is due to the maternal request after the onset of labour [11,13]. Gestational age at delivery in the control and study groups was 39.92 ± 0.55 and 40 ± 0.56 respectively. No studies found gestational age at delivery.

The indication for LSCS in control group and study group for foetal distress was 19.7% and 12.9% respectively. In the study by Peng

Chiong Tan et al., the indication for LSCS in control group and study group for foetal distress were 51% and 40% respectively. Vardhan Shakti et al., reported 88% undergone LSCS for foetal distress and 15% for scar tenderness [13,15].

LIMITATIONS

The limitations of present study are small sample size, subjective variations in assessing Bishops Score, assessing scar tenderness. Further studies are needed with larger sample size, avoiding the subjective variation regarding Bishop Score, assessment of scar tenderness and proper psychological support, to labouring patients with previous LSCS to know the effect of membrane sweeping on obstetric outcome.

CONCLUSION

Although membrane sweeping is an easy way of inducing labour, present study failed to demonstrate its beneficial effect on obstetrical outcome due to the limitations like subjective variations in assessing Bishops Score, assessing scar tenderness. But based on literature review, this procedure may be followed to reduce post term pregnancy.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: Sep 08, 2014

Date of Peer Review: Mar 26, 2015

Date of Acceptance: May 08, 2015

Date of Publishing: Aug 01, 2015