

A Comparative Study of Vertical Mattress and Reverse Vertical Mattress Sutures for Repair of Episiotomy

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Abstract

Objective: Episiotomy is a surgically planned incision on the perineum and posterior vaginal wall during the second stage of labour. A planned episiotomy is better where perineal tears are anticipated. Short or long-dated maternal morbidity related to perineal repair might be associated with physical, social or psychological issues, which may impact the daily routine of the female. Hence it is important to select the best method for episiotomy repair.

Aim: To compare vertical mattress and reverse vertical mattress suture for episiotomy repair

Study Design: Randomized comparative intervention study

Setting: Study conducted at Kempegowda institute of medical sciences and research, Bangalore.

Duration: 6 Months

Subject and methods: This study was conducted at KIMS Hospital, Bangalore, over a period of 6 months. A total of 50 patients delivering a singleton fetus and who were given episiotomy were included in this study. They

were divided into two groups randomly (25 each). Group A included repair of episiotomy by vertical mattress sutures and group B by reverse vertical mattress sutures with chromic catgut suture material.

Results: In our study we noted that perineal pain at 2nd day, 10th day and at 2 months measured by visual analogue scale was comparatively less with group B (Reverse vertical mattress sutures) 6.48 ± 0.154 when compared to Group A (Vertical mattress sutures) 8.76 ± 0.771 , indicating statistical significance. The study groups were compared for pain under various circumstances (movement, sitting, urinating/defecating) using VAS. The pain was significantly less on day 2 and 10 in group B.

There was no significant difference between the two groups regarding Perineal repair rate, need for analgesics, post-natal stay, wound infection, healing defects, anal sphincter dysfunction and patient satisfaction.

Conclusion: Reverse vertical mattress suture is recommended over vertical mattress suture technique

since it is associated with less perineal pain and lesser cosmetic disfiguration.

Keywords: episiotomy repair, vertical mattress, reverse mattress

Introduction

Episiotomy is a surgically planned incision on the perineum and posterior vaginal wall during the second stage of labour.

All across the world, the episiotomy rates continue to be higher than recommended, ranging from 20 % in France, 54 % in Brazil and as high as 90 % in Cambodia and 100 % in Taiwan (Cesar et al., 2022). India has documented high episiotomy rates of around 40 % with over 90 % in primigravida¹. Millions of women worldwide have perineal trauma during childbirth, which can lead to long-term maternal morbidity.

As per the (American College of Obstetricians and Gynecologists), the choice whether to give episiotomy or not purely depends on clinical considerations.²

After perineal repair, most women have some temporary discomfort or pain, and up to 20% may develop persistent issues such superficial dyspareunia³

The anatomical components involved in perineal tears determine their classification

- first degree involves only the perineal skin
- second degree involves the perineal muscles and skin
- third degree (injury to the anal sphincter complex - 3a = less than 50% of the external anal sphincter torn; 3b = more than 50% of the external anal sphincter torn; 3c = internal anal sphincter also torn)
- fourth degree (injury to the perineum involving the anal sphincter complex and anal epithelium)⁴

Maternal morbidity associated with perineal repair, whether brief or prolonged, may lead to physical, social,

or psychological problems that affect the mother's capacity to care for her infant and her family⁶

The degree of the perineal injuries and the efficacy of the treatment determines the outcome.

Indications of episiotomy.⁵

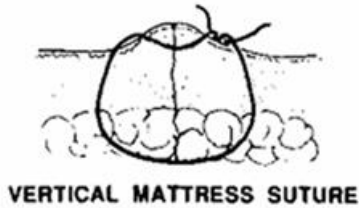
- Rigid perineum
- Shorten second stage of labour in case of foetal distress or when mother is hypertensive or k/c/o cardiac disease
- When assisted vaginal deliveries are performed
- Shoulder dystocia
- Assisted breech delivery

Three steps are included in the repair of an episiotomy.

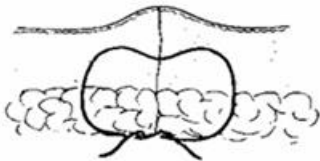
To close the vagina, continuous stitches are introduced using a loop knot, starting at the wound's apex and terminating at the site of the fourchette. The perineal muscles are subsequently approximated employing interrupted deep and superficial sutures.

The conventional technique for approximating wound borders is the typical vertical mattress sutures. These sutures frequently create permanent scars where it enters and exits the epidermis, which is its main drawback. Other method for wound approximation is reverse vertical mattress sutures. The advantages of reverse vertical mattress sutures are combined with those of traditional vertical mattress sutures such as minimal infection potential and minimum discomfort because of the minimum exposure of the suture material and the knots. It also provides prolonged support without suture marks and less chances of leaving a permanent scar over the skin.⁷

The purpose of the current study was to compare the results of reverse vertical mattress and vertical mattress for episiotomy repair in order to identify and apply the most effective method and have the best outcome.



VERTICAL MATTRESS SUTURE



BURIED VERTICAL MATTRESS SUTURE

Material and Methods

The study included 50 pregnant women admitted for labour, underwent mediolateral episiotomy before vaginal delivery in department of Obstetrics and Gynaecology of Kempegowda Institute of Medical Sciences and Research.

Inclusion Criteria

1. Normal vaginal delivery
2. Term gestation
3. Vertex presentation
4. Live baby

Exclusion Criteria

1. Third and fourth degree perineal tear
2. Instrumental vaginal delivery
3. Previous perineal surgery
4. Breech presentation
5. Coagulation disorders
6. Delivery conducted outside KIMS Hospital

Written informed consent was obtained from all participants and the study was approved by the ethic committee.

During second stage of labor mediolateral episiotomy was given at the time of crowning, with episiotomy scissors under local anesthesia (lignocaine).

Patients were allotted randomly to 2 groups of 25 each.

Group A – Episiotomy repair was done by vertical mattress sutures with chromic catgut (0). The mucosa was sutured with continuous interlocking sutures, muscles was approximated by intermittent suture and the skin was closed with vertical mattress sutures.

Group B – Episiotomy repair was done by reverse vertical mattress sutures using chromic catgut (0). The mucosa was sutured with continuous interlocking sutures, muscles was approximated intermittent suture and the skin was closed with reverse vertical mattress sutures.

Before discharging patient from labor room, patient was encouraged to void, 1 dose of IV antibiotic was given with adequate analgesia, local care along with sitz bath and IR Rays was advised. Post procedure local care of the wound was explained to the patient.

The patient was monitored on days 2, 10, 2 months after the repair. A visual analogue scale was used to measure the patient's discomfort, which ranges from 0 to 10 (no pain, 1-3 mild, 4-6 moderate, 7-9 severe, and 10 worst agony).

Patients were assessed for wound healing, wound gaping, hematoma formation, the requirement for additional analgesia and patient satisfaction on day 2 and 10 following repair. The patients were also asked about discomfort under various circumstances (moving, sitting, urinating/defecating).

Data analysis- Data was entered in Microsoft excel and results were analyzed by using percentage and proportions where ever necessary.

Results

This study was carried out on 50 pregnant women who were randomly selected to get episiotomy repair done by

either vertical mattress or reverse vertical mattress suture technique.

Table 1: Distribution according to Demographic factors

Parameters	Group A	%	Group B	%
1.Age (Yrs)				
18-22	4	16%	3	12%
23-28	15	60%	16	64%
29-34	5	20%	6	24%
35-40	1	4%	0	0%
2.Employment Status				
Employed	3	12%	1	4%
Unemployed	22	88%	24	96%
3.Prenatal Care				
Regular	18	72%	19	76%
Irregular	7	28%	6	24%
4.Fetal Birth Weight				
2.00-2.59	8	32%	5	20%
2.60-3.09	13	52%	14	56%
3.10-3.59	4	16%	4	16%
3.60-4.00	0	0%	2	8%

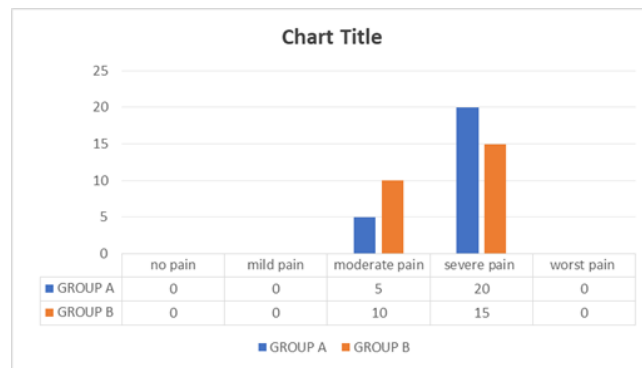
As shown in table 1, when the two groups were compared on basis of maternal age, majority belonged to the age group of 23-28 yrs with 60% cases in group A and 64% cases in group B. 12% in group A and 4% in group B were employed. In both the groups majority of women received prenatal care 72% in group A and 76% in group B. mostly Foetal birth weight was noted to be in the range 2.60-3.09 kgs with 52% cases in group A and 56% cases in group B.

Table 2- Pain Assesment On Day 2, 10 and at 2 Months using Visual Analogue Scale (no pain -0, 1-3 mild, 4-6 moderate, 7-9 severe, 10 worst)

Table 2.1- pain assessment on day 2

Day 2	Group A	%	Group B	%
No pain	0	0%	0	0%
1-3	0	0%	0	0%
4-6	5	20%	10	40%
7-9	20	80%	15	60%
10	0	0%	0	0%

Graph 1: pain assessment on day 2

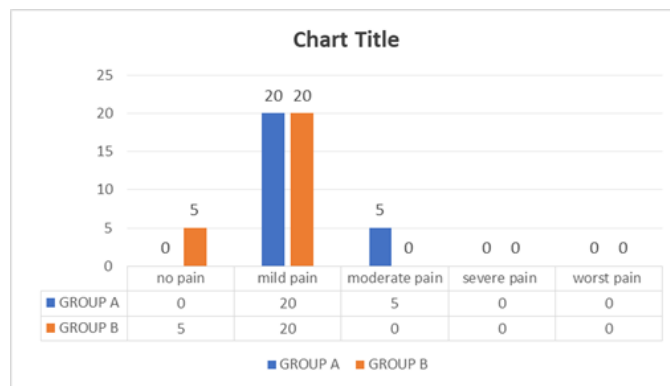


In the above table when perineal pain was compared on day 2 using VAS, group B 40 % complained of moderate pain whereas 60% complained of severe pain. In group A 80% complained of severe pain and 20 % complained of moderate pain.

Table 2.2: pain assessment on day 10

DAY 10	Group A	%	Group B	%
No pain	0	0%	5	20%
1-3	20	80%	20	80%
4-6	5	20%	0	0%
7-9	0	20%	0	0%
10	0	0%	0	0%

Graph 2: pain assessment at day 10

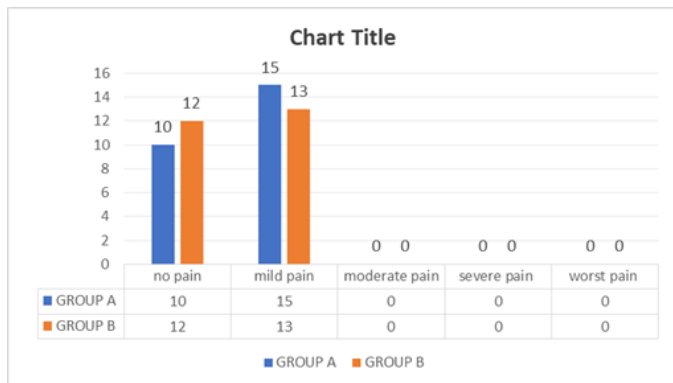


In the above table when perineal pain was compared on day 10 using VAS, In Group B 80 % complained of mild pain whereas 20% complaint of no pain. In group A 80% complaint of mild pain and 20 % complaint of moderate pain.

Table 2.3: pain assessment at 2 months

2 months	Group A	%	Group B	%
No pain	10	40%	12	48%
1-3	15	60%	13	52%
4-6	0	0%	0	0%
7-9	0	0%	0	0%
10	0	0%	0	0%

Graph 3: pain assessment at 2 months



In the above table when perineal pain was compared at 2 months using VAS, In Group B 48 % complained of no pain whereas 52% complaint of mild pain. In group A 60% complaint of mild pain and 40 % complaint of no pain.

Table 2.4: Comparison of pain on day 2,10 and at 2 months

	Group A (X ± SD)	Group B (X ± SD)	P Value
Day 2	8.76±0.771	6.48±0.154	P < 0.0001
Day 10	3.24±0.969	1.68±1.107	P < 0.0001
2 month	0.56±0.506	0.52±0.509	P = 0.7817

The above table shows comparison of perineal pain after episiotomy repair at day 2, 10 and 2 months. In group B, perineal pain was comparatively lesser on day 2 (6.48±0.154) and day 10 (1.68±1.107) when compared with group A on day 2 (8.76±0.771) and day 10 (3.24±0.96), showing statistical significance. whereas

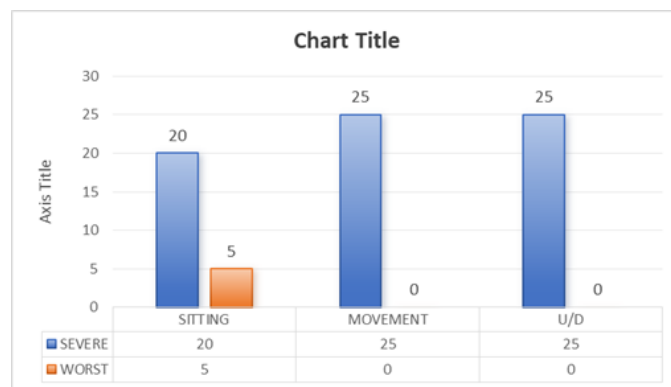
when compared at 2 months, the difference between the two groups became non-significant.

Table 3: comparison between two groups during various circumstances using VAS at day 2,10 in group A

Table 3.1 pain at day 2 and day 10 in group A

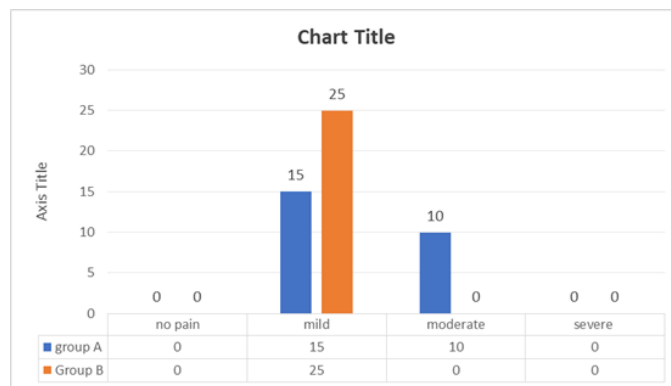
Day 2	Sitting	%	Movement	%	U/D	%
No Pain	0	-	0	-	0	-
mild	0	-	0	-	0	-
Moderate	0	-	0	-	0	-
severe	20	80%	25	100%	25	100%
worst	5	20%	0	-	0	-

Graph 4: pain at day 2



Day 10	Sitting	%	Movement	%	U/D	%
No Pain	0	-	0	-	0	-
mild	15	60%	25	100%	25	100%
Moderate	10	40%	0	-	0	-
severe	0	-	0	-	0	-
worst	0	-	0	-	0	-

Graph 5: pain at day 10



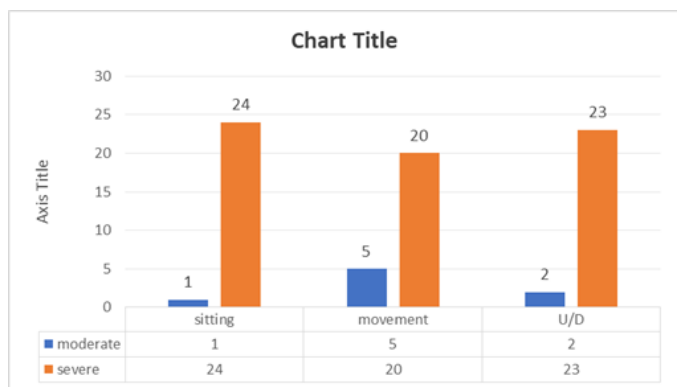
In the above tables, perineal pain was compared on day 2 and 10 using VAS. On day 2 80% complaint of severe

pain on sitting. 100% complaint of severe pain on movement and urination/defecation. On day 10, 60 % complained of mild pain on sitting, 100% complained of mild pain on movements and urination/defecation.

Table 3.2 - pain at day 2 and day 10 in group B

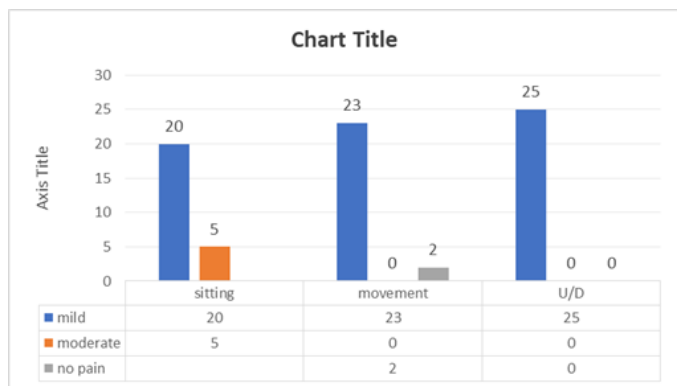
Day 2	Sitting	%	Movement	%	U/D	%
No Pain	0	-	0	-	0	-
mild	0	-	0	-	0	-
Moderate	1	4%	5	20%	2	8%
severe	24	96%	20	80%	23	92%
worst	0	-	0	-	0	-

Graph 6: pain at day 2 in group B



Day 10	Sitting	%	Movement	%	U/D	%
No Pain	0	-	2	8%	0	-
mild	20	80%	23	92%	25	100%
Moderate	5	20%	0	-	0	-
severe	0	-	0	-	0	-
worst	0	-	0	-	0	-

Graph 7: pain at day 10 In Group B



In the above tables, perineal pain was compared on day 2 and 10 using VAS. On day 2 96% complaint of severe

pain on sitting, 80% complaint of severe pain on movement and 92% on urination/defecation. On day 10, 80 % complained of mild pain on sitting,92% complained of mild pain on movements and 100% mild pain on urination/defecation.

Table 3.3: comparison between the two groups

Day 2	Group A	Group B	P Value
Movement	8.44 ± 0.983	7.84 ± 0.731	0.018
Sitting	7.84 ± 0.783	6.88 ± 0.515	<0.0001
Urination/Defecation	8.6 ± 0.632	7.03 ± 0.517	<0.0001
Day 10			
Movement	1.68 ± 0.614	1.16 ± 0.542	0.0026
Sitting	3.16 ± 0.783	2.92 ± 0.775	0.2812
Urination/Defecation	1.6 ± 0.489	1.32 ± 0.466	0.0436

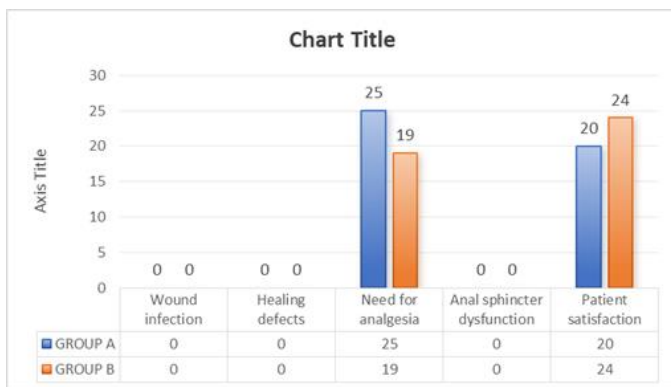
The above table shows comparison of perineal pain after episiotomy repair under various circumstances at day 2,10 and 2 months. In group B, perineal pain was comparatively lesser on day 2 during movement (7.84 ± 0.731), sitting (6.88 ± 0.515) and urination/defecation (7.03 ± 0.517) when compared with group A on day 2 during movement (8.44 ± 0.983), sitting (7.84 ± 0.783) and urination/defecation (8.6 ± 0.632)showing statistical significance. whereas when compared at 2 months , the difference between the two groups became non-significant .

Table 4: comparison between both groups regarding need for analgesia (at day 2,10), wound infection, healing defects, anal sphincter dysfunction and patient satisfaction at 2 months

	Group A	%	Group B	%
Wound infection	0	-	0	-
Healing defects	0	-	0	-
Need for analgesia	25	100%	19	76%
Anal sphincter dysfunction	0	-	0	-
Patient satisfaction	20	80%	24	96%

The above Table shows comparison of both the groups regarding need for analgesia at day 2 and day 10 almost all in group A and 79% in group B required analgesia. Patient satisfaction was considerable 80% in group A and 96% in group B.

Graph 8: comparison between both groups regarding need for analgesia (at day 2, 10), wound infection, healing defects, anal sphincter dysfunction and patient satisfaction at 2 months



Discussion

A total of 50 pregnant women were enrolled into the study, they were randomly assigned into two groups; each included (25) women. The first group received vertical mattress suture technique for episiotomy repair, while the second group received reverse vertical mattress suture technique.

Concerning the pain using visual analogue scale, on day 2 and day 10, there was significant difference between

the vertical mattress and reverse vertical mattress techniques, under which reverse mattress group experienced less pain on day 2 (6.48±0.154) and day 10 (1.68±1.107) while vertical mattress groups experienced more pain on day 2 (8.76±0.771) and day 10 (3.24±0.969). the difference in the degree of pain was non-significant when compared at 2 months (0.56±0.506) table2. Short-term pain - up to day 10 postpartum Nine trials presented data for inclusion in this analysis[8] (Almeida 2008; Banninger 1978; Croce 1997; Isager-Sally 1986; Kettle 2002; Mahomed 1989; Morano 2006; Perveen 2009; Valenzuela 2009). Pooled results indicated that the risk of experiencing short-term pain is more when vertical mattress suture techniques are used for perineal repair (average RR 0.76; 95% CI 0.66 to 0.88; 95% prediction interval 0.49 to 1.19, nine trials, 4231 women)

Also when compared on day 2 and 10 , the two groups for pain using VAS under various circumstances such as moving, sitting, urinating/defecating, group with reverse mattress sutures experienced less pain.

There was non-significant difference between the two groups regarding Perineal repair rate, need for analgesics, Post-natal stay, wound infection, healing defects, need for analgesia, anal sphincter dysfunction and patient satisfaction. With respect to wound infection

the results of the present Study coincide with those of Kettle et.al.and Morano et al. [9,10] who mentioned no significant differences in their study groups regarding wound infection. However, Kokanali et al. did not observe any episiotomy infections.

john a. zitelli, m.d. ronald l. moy, m.d.[11] conducted a study on Buried Vertical Mattress Suture and concluded that reverse (modified buried) vertical mattress suture technique, provides excellent wound edge eversion and prolonged support without permanent suture marks.

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