

Comparison of Efficacy of Two Suture Materials, i.e., Monofilament Suture and Multifilament Suture as Subcuticular Skin Stitches in Post-Cesarean Women: A Randomized Clinical Trial.

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Abstract

Background: Objective: To compare the efficacy of two suture materials, i.e., Monofilament Suture and Multifilament Suture, as subcuticular skin stitches in post-cesarean women. Study Design: This was a randomized clinical trial. Population The study was conducted in the department of obstetrics and gynecology of Government Hospital Gandhi Nagar, Jammu. Only those women undergoing emergency cesarean section were included. **Subjects and Methods:** The study was conducted in the department of obstetrics and gynecology of Government Hospital Gandhi Nagar, Jammu, India. 120 women undergoing emergency cesarean section were included and divided into two groups. In group 1, Monofilament suture (poliglecaprone 25) was used as subcuticular skin stitches; in group 2, Multifilament suture (polyglactin 910) was used as subcuticular skin stitches. **Results:** 36.6% of patients in group 2 had pain and tenderness as compared to 6.6% in group 1 on day 4. 10% had discomfort as compared to 6.6% in group 1 on day 4. In group 1, 6.6 % patients had swelling and indurations, while it was 3.3 % in group 2 on day 4. Wound dehiscence was 20% in group 2 as compared to 10% in group 1. Regarding wound healing, 93.3 % patients had excellent wound healing in group 1 and 66.6 % in group 2. **Conclusion:** It was concluded that complications like swelling and induration, wound discharge and wound dehiscence were significantly less in poliglecaprone as compared to polyglactin 910 group.

Keywords: Cesarean Section, Monofilament, Multifilament.

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Introduction

The goals of wound closure include obliteration of dead space, even distribution of tension along deep suture lines, and maintenance of tensile strength across the wound. It is intended to achieve adequate tensile strength after approximation and eversion of its epithelial portion. Suture closure permits primary wound healing as tissue is held in proximity until enough healing has occurred to withstand stress without mechanical support. Suture material being a foreign body implanted in the human tissue elicits a foreign body tissue reaction. Complications of wound healing can result from patient factors, such as nutritional status, incorrect suture selection or a technique which causes excessive tension across the wound.

Monofilament suture is made of a single strand, a structure that is relatively more resistant to harboring microorganisms. The monofilament sutures experience less resistance to passage through tissue than multifilament suture. Great care must be taken in handling and tying a monofilament suture because crushing or crimping can nick

or weaken the suture leading to premature suture failure. A multifilament suture is composed of several filaments twisted or braided together. Although this material is less stiff, it has a higher coefficient of friction. Multifilament suture generally has greater tensile strength, better pliability and flexibility than monofilament suture. This type of suture ties well. Since multifilament materials have more capillarity, the resultant increased absorption of fluid may act as a tract for the introduction of pathogens.^[1]

Subjects and Methods

Study Design

This was a randomized clinical trial. Institutional Ethical Committee and departmental review board approval was taken for this study. Informed consent was obtained before enrollment.

Study Setting and Population

The study was conducted in the department of obstetrics and gynecology of Government Hospital Gandhi Nagar,

Jammu, India. Only those women undergoing emergency cesarean section were included.

Inclusion Criteria

The inclusion criteria were as follows: hemoglobin more than 10 gm %, all cesarean sections done on an emergency basis in the same operation theater, the same technique of cesarean section used, and cesarean section done by qualified obstetricians.

Exclusion Criteria

The exclusion criteria were as follows: previous abdominal surgeries, medical illness (Koch’s, bronchial asthma, hypertension, diabetes, hematological disorders), and skin infections.

Study Protocol

Once eligibility and exclusion criteria were confirmed and informed consent was obtained, 120 women were randomized by computer-generated randomized numbers and divided into two groups.

Group 1

Monofilament absorbable suture, i.e., poliglecaprone 25, was used as subcuticular skin stitches.

Group 2

Multifilament absorbable suture, i.e., polyglactin 910, was used as subcuticular skin stitches.

All women received the same antibiotics and the same analgesics. Effects were studied on day 4, day 10, 1 month, and 2 months post-surgery on the basis of pain and tenderness, swelling and induration, discharge from wound, dehiscence, discomfort, wound healing, and cosmesis. Pain and tenderness were assessed on the basis of the Visual Analog Scale. The rest of the parameters were assessed as follows: swelling and induration assessed in the form of erythema and edema; discharge from the wound as serous, serosanguinous, or purulent; wound dehiscence as superficial or deep; discomfort by a different questionnaire; and wound healing and cosmesis by the Modified Hollender Cosmesis Scale which was composed of six items: step off borders, edge inversion, contour irregularities, excess inflammation, wound margin separation, and overall appearance.^[2,3]

Results

Out of 120 women enrolled, 60 were randomized to group 1 and 60 to group 2.

Statistical Analysis

The statistical test employed was chi-square test. Where the expected cell count in any one cell was less than five, the P value was taken based on Fischer’s exact test. Two-tailed P values were considered for all the tests.

According to this, P > 0.05 - not significant; P < 0.05 - significant.

Table 1: Day 4.

Parameters	Group 1 (n = 60) (%)	Group 2(n = 60) (%)	P value	
a) Pain and tenderness	22 (36.6)	22(36.6)	Group 1 and 2	No difference
b) Discomfort	4(6.6)	6(10)	Group 1 and 2	P = 1 (>0.05)
c) Swelling and induration	4(6.6)	20(33.3)	Group 1 and 2	P = 0.009 (<0.05)
d) Wound discharge	2(3.3)	16(26.6)	Group 1 and 2	P = 0.025 (<0.05)
e) Wound dehiscence	6(10)	12(20)	Group 1 and 2	P = 0.471 (>0.05)

Table 2: Day 10.

Parameters	Group 1 (n = 60) (%)	Group 2(n = 60) (%)	P value	
a) Pain and tenderness	12(20)	12(20)	Group 1 and 2	No difference
b) Discomfort	2(3.3)	12(20)	Group 1 and 2	P = 0.102 (>0.05)
c) Swelling and induration	4(6.6)	16(26.6)	Group 1 and 2	P = 0.037 (<0.05)
d) Wound discharge	4(6.6)	18(30)	Group 1 and 2	P = 0.019 (<0.05)
e) Wound dehiscence	2(3.3)	16(26.6)	Group 1 and 2	P = 0.025 (<0.05)

Table 3: Day 30.

Parameters	Group 1 (n = 60) (%)	Group 2(n = 60) (%)	P value	
a) Pain and tenderness	2 (3.3)	2(3.3)	Group 1 and 2	No difference
b) Discomfort	0(0)	2(3.3)	Group 1 and 2	Test invalid as no patient in group 1
c) Swelling and induration	0(0)	2(3.3)	Group 1 and 2	Test invalid
d) Wound discharge	0(0)	0(0)	Group 1 and 2	No difference
e) Wound dehiscence	0(0)	8(13.3)	Group 1 and 2	Test invalid

Table 4: Distribution of patients with respect to status of wound healing at suture line at 1 and 2 months post-surgery

Group (n=60)	Excellent Wound Healing 6/6		1 Month	2 Month
	1 Month (%)	2 Month (%)		
Group 1	52 (86.6)	56 (93.3)	Group 1 and 2	Group 1 and 2
			P = 0.019 (<0.05)	P = 0.009 (<0.05)
Group 2	36 (60)	40 (66.6)		

The two groups were similar in age, weight, type of surgery, and type of skin incision. As shown in [Tables 1,2 and 3] there was no difference with respect to pain and tenderness on day 4, 10, and 30. There is no statistically significant

difference between group 1 and 2 with respect to the presence of discomfort at suture site as assessed on day 4 and day 10. With respect to swelling and induration, there is a significant difference between group 1 and 2 on day 4 (6.6 % in group 1, 33.3 % in group 2) and day 10 (6.6 % in group 1, 26.6 % in group 2) and with respect to wound discharge there is significant difference between group 1 and 2 on day 4 (3.3 % in group 1, 26.6 % in group 2) and day 10 (6.6 % in group 1, 30 % in group 2). On day 30, no statistical test was applicable as the number of patients in all two groups was zero. There is no significant difference between group 1 and 2 on day 4 according to wound dehiscence, but a significant difference on day 10 (3.3 and 26.6 % in group 1 and 2, respectively). There is statistically significant difference between group 1 and 2 (93.3 and 66.6 %, respectively) with respect to the status of the wound healing at the suture line at 1 and 2 months post-surgery, as shown in [Table 4].

Discussion

This the unique study that has analyzed cosmetic outcomes and complications of skin closure of cesarean section patients using monofilament versus multifilament sutures. There seems to be no universal agreement among authorities in choosing the ideal type of suture material for wound repair. Breed et al.^[4] compared the possible influence of two absorbable suture materials on the formation of scar tissue in women undergoing reduction mammoplasty. The scars were examined after periods of 2 weeks, 3 months, and 1 year. The monofilament poliglecaprone 25 produced significantly narrower scars than polyglactin 910. Ooster et al.^[5] in a randomized control trial compared polyglycolic acid and monofilament polyglyconate sutures for abdominal fascial closure after laparotomy in patients with suspected impaired wound healing. Wound infection demanding surgical intervention was found in 7 % of patients with polyglyconate and 16 %

with polyglycolic acid sutures (P 0.04). In our study, the number of patients having wound discharge and induration was significantly more in group 2 (P < 0.05) where polyglactin suture was used as compared to poliglecaprone. Our study suggests that the risk of wound dehiscence was more where polyglactin suture was used as compared to poliglecaprone, as it is a multifilament suture and has more chances of infection. When wound healing was reviewed 2 months after surgery, the number of cases showing excellent healing was more in group 1 (P < 0.05) where poliglecaprone was used.

Conclusion

Monofilament and Multifilament were comparable to each other with respect to pain and discomfort. Monofilament suture has statistically significant less incidence of swelling and induration, wound discharge and wound dehiscence (P < 0.05 in each complication) as compared to multifilament suture.

Wound healing is excellent with monofilament suture than multifilament suture.

References

1. Islem A, Ehsan A. Comparison of suture material and technique of closure of subcutaneous fat and skin in cesarean section. *N AM J Med Sci* 2011; 3:85-88.
2. Hollander JE, Singer AJ, Valentine S, et al. Wound registry: development and validation. *Ann Emerg Med*. 1995;25:475-85.
3. Quinn JV, Drzwiecki AE, Stiell IG, et al. Elmslie TJ. Appearance scales to measure cosmetic outcomes of healed lacerations. *Am J Emerg Med*. 1995;13:229-31.
4. Breed CM, Van der Biezen JJ, Marck KW, et al. Comparison of two absorbable suture materials on the formation of scar tissue, inpatients who had undergone reduction mammoplasty. *Euro J Plast surg*. 1998;22:251-4.
5. Ooster PJ, Gjode P, Mortensen PB, et al. Randomised comparison of polyglyconate sutures for abdominal fascial closure after laparotomy in patients with suspected impaired wound healing. *Br J Surg*. 1995;82:1080-2.

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