

## Comparison of staplers and nylon sutures in skin incision of elective caesarean sections

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### Abstract

Surgical site infection is common in post operative patients. Some of the complications are redness and pain at the site of closure, fever, wound necrosis, collection, wound dehiscence and scar. Skin closure by metallic staplers is quick method of skin approximation. It reduces closure time by half in comparison to Ethilon suture. The scar of staplers is comparatively better than suture.

**Keywords:** Metallic Staplers, Sutures, wound closure, Scar.

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### Introduction

Every year several millions of women undergo caesarean section. As a result of that they acquire an abdominal scar. Nowadays women of all ages place extreme importance on the appearance of the scar in addition to the symptoms of pain, tenderness and itching. An aesthetically poor scar can have a negative impact on the overall quality of life causing considerable distress, loss of self-esteem and unhappiness.<sup>(1,2)</sup>

The outcome of the surgical skin closure is influenced by the indication of the procedure, the location of the surgical site and the associated intra-operative or post-operative complications. The general medical condition of the patient is also of considerable importance. These factors are usually outside the control of the surgeon. The surgeon, however, can choose the technique of closure and the suture material.<sup>(3)</sup>

The technique of closure should be quick, easy, cost effective and simple, while maximising wound cosmesis and patient satisfaction. The technique should be based on evidence and not only on the surgeon's preference and tradition. Any of the methods used should be able to restore the physical integrity and function of the injured tissue. Appropriate and careful selection of suture material is important. Choosing the appropriate materials and adhering to good wound closure technique will ensure optimal wound healing.<sup>(4)</sup> Cost of the procedure should also be considered. Closure should serve both functional and aesthetic purposes.<sup>(5)</sup>

Effective wound closure includes elimination of the dead space by approximating the subcutaneous tissues, minimization of the scar formation by careful epidermal alignment, and avoidance of a depressed scar by precise approximation of the skin edges. Atraumatic handling of the wound combined with avoidance of tight closures and undue tension contribute to excellent

results. The wound should be able to withstand the daily tensile forces and be able to heal expeditiously and effectively when it is most vulnerable.

### Methods

The Proposed study was conducted on 100 patients who attended Obstetrics OPD and underwent caesarean operations on elective basis.

**Sample Size:** 100 patients

**Study Design:** Prospective randomized controlled study.

**Duration of Study:** May 2015 to April 2016

**Place:** Department of Obstetrics & Gynaecology, Santosh Medical College and Hospital, Ghaziabad

### Inclusion Criteria

1. Age Group 14years to 45 years.
2. Patients undergoing Elective caesarean Surgeries.

### Exclusion Criteria

1. All Diabetics.
2. Immunocompromised patients.
3. All emergency surgeries.

**Sample Size:** Initially one hundred patients were randomised to receive surgical staplers or nylon sutures with the intention to add more patients if needed for statistical power. This sample size was for convenience. Our results after 100 cases showed enough evidence and after consultation with a statistician we did not recruit any further patients.

**Randomisation:** Patients were randomised into two groups preoperatively by random number table. Suture group had 49 patients and Stapler group had 51 patients.

**Methodology**

1. Patients subjected to elective caesarean surgeries were recruited for the study after satisfying inclusion and exclusion criteria.
2. All patients had routine check-up.
3. PAC was done.
4. All patients received pffanesteil incision for the caesarean section. At the completion of the operative procedure the skin incision was measured and wound closure was done by interrupted sutures or staplers.
5. Incision line was inspected on 3rd and 7th day.
6. Sutures/staplers were removed on 10th day.
7. Patients were called for follow up on 30th day.
8. All patients were given antibiotics (gram +ve, gram -ve and anaerobic coverage) and analgesics.
9. Patients were also asked about pain and cosmesis which was assessed on the VAS scale of 1 to 5. A simple pain scale was used. Where 1 means no pain, 2 means mild pain, 3 means moderate pain, 4 means severe pain and 5 means very severe pain. Similarly patient satisfaction regarding cosmesis was assessed on a scale of 1 to 5 where 1 corresponds to extremely satisfied, 2 corresponds to satisfactory, 3 corresponds to neutral, 4 corresponds to not satisfied and 5 corresponds to extremely not satisfied.

**Outcomes Measures:** The primary outcome was patient satisfaction regarding wound cosmesis and pain.

Secondary outcomes were the cost of the procedure and wound complications.

Patients undergoing operation were informed about the details of the study. Consent was taken before the operation. A consent and information form was signed.

**Statistical Analysis:** Analysis was done with the help of IBN SPSS Statistics version 17/GeNIe/Open Bug.

Statistical analysis was performed using the chi-square test or student's t-test as applicable. Statistical significance was defined if the p value was <0.05.

**Results**

The p value of mean age of suture and stapler group was >0.05 thus the difference between the two was not significant.

Group	Mean age
Suture	37.35±10.08
Stapler	38.15±7.12

**Length of Scar**

	Mean(CM)	SD	p Value
Suture	6.73	1.85	0.86
Staple	6.86	1.96	(NS)

\*NS- Not Significant

**Time taken for skin closure in minutes**

	Mean (in Minutes)	SD	p Value
Suture	11.14	5.58	<0.05 (S)
Staple	5.58	6.23	

\*S – Significant

**Grade of pain – Simple pain scale**

	1-3	4-5
Suture (49)	46	3
Staple (51)	47	4
p value	0.77(NS)	0.42(NS)

**Wound Healing**

	Seroma	PUS Discharge
Suture	3	3
Staple	1	0
p Value	>0.05 (NS)	<0.05(S)

\* NS – Non Significant

\* S - Significant

**Patient satisfaction with cosmesis**

	Suture	Staple	p value
Extremely Satisfied	0	0	p>0.05(NS)
Satisfactory	49	46	
Neutral	0	5	
Not Satisfied	0	0	
Extremely not satisfied	0	0	

**Cost of Procedure**

	Mean (in Rs.)	SD	p Value
Suture	250.00	0	p<0.05 (S)
Staple	500.00	0	

**Discussion**

Staplers are made up of stainless steel. They are virtually inert. They have uniform shape and constant staple depth providing even wound tension. Rectangular shape design minimizes the trauma and minimizes the tissue compression thereby causing minimal tissue reaction and trauma and leads to wound healing with minimum scar.

The development of disposable skin staplers has made this method of wound closure an increasingly popular technique. Skin staplers are quick and easy to use and numerous studies have confirmed the speed and efficacy of stapling compared with suture repair.

In our study we found that the closure of wound was 2 to 3 times more faster with staplers as compared with sutures. Fever, tachycardia, pain, redness at wound site, wound dehiscence and collection of pus was found to be twice as higher with sutures where as with staplers it was less.

Management of post-operative infections with specific antibiotics, drainage of pus and secondary suturing was required more in cases where suture material was used as compared to staplers, which has reduced further the duration of stay of the patient, cost and pain.

Scar quality was good in cases of staplers as compared to sutures.

Cost of stapler was however twice as costlier when compared to sutures.

### **Conclusion**

Our study concludes that staplers reduce the time of skin closure from that of nylon suture. However stapler cost higher in comparison to sutures it adds on to the cost which is twice of nylon suture which is statistically significant and in agreement with the literature reviewed. Staplers have good acceptance amongst patients specially in clear effective cases and have a lesser rate of seroma formation and pus discharge as compared to nylon sutures thereby reducing post operative morbidity and mortality.

The literature available is in conjunction with our study thus concluding that the advantage of staplers

over weigh its cost but more useful and better means for skin closure in elective cases than nylon sutures.

### **Declaration**

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**Conflict of interest:** None declared

**Ethical approval:** In accordance with ethical standards

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