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ORIGINAL RESEARCH

A comparative study of outcome of skin staple and skin suture in closure of abdominal incision

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Abstract

Background: Development of newer techniques of surgical wounds closure which are not associated with contamination. Hence this study was undertaken to study the operative time, the effect on wound healing, cosmetic results, patient's acceptance and total cost with the use of sutures and staples at our institute.

Materials & Methods:60 patients in the department of General surgery at SriAurobindo Medical college and post graduate institute were divided into 2 groups. Group I (30) had patients whom abdominal incision close by skin staple and group II (30) had patients whom abdominal incision close by skin suture (monofilament nylon). Parameters such as site of incision, type of wound, time factor, mean closure time, cost and patients acceptance was recorded and compared in both groups. Patients were studied in the post operative day 3rd, 7th,10th, 30th day for wound healing.

Results: Group I had 16 males and 14 females and group II had 15 males and 15 females. In group I and group II, site of incision was midline in 12 and 5, inguinal in 5 and 6, transverse in 3 and 5, paramedian in 4 and 5, subcoastal in 2 and 4 and Mc Burney's in 4 and 3 respectively. Wound type was A in 18 and 13, B in 7 and 9 and C in 5 and 8. Time was 12 sec/cm and 42 sec/cm. Closure time was 8 and 24. Linear verbal analog pain score was 4.7 and 3.2. Cost in A was 64.2 and 85.2, in B was 90.5 and 87.9 and in C was 286.2 and 175.2. Patient acceptance was good in 27 and 20 in group I and II respectively.

Conclusion: Stapling is more convenient, time saving and cost effective, routine staple removal is less painful compared to suture removal, so staplers resulted in a substantial and worthwhile saving in time for wound closure.

Key words: Stapling, wound closure, Mc Burney's

Introduction

The act of sewing is as old as Homo sapiens. In Susruta Samhitha 600 BC there is mention of suture material made from animal sinews, braided horsehair, leather strips, and vegetable fibers.[1] This text describes in detail triangular, round bodied, curved, and straight needles.[2] For many years it has been possible to approximate the skin edges using suture however sutures have the disadvantages of consuming more time and applying with a cosmetically inferior scar. The use of automatic stapling device for skin closure has become more popular of late, to overcome these disadvantages.[3]

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Most of the devices are disposable and relatively expensive, but their cost is offset by saving operative time and potential increase in range of surgery.[4] Development of newer techniques of surgical wounds closure which are not associated with contamination i.e. stapling suggest that wound closure with staples is almost three times faster thus time saving.[5] Skin staples are better alternatives to conventional sutures in head and neck cancer surgery as they offer ten times faster wound closure, cost effectiveness and similar results to sutures in terms of patients comfort, aesthetic outcome and complication rate.[6] Hence this study was undertaken to study the operative time, the effect on wound healing, cosmetic results, patient's acceptance and total cost with the use of sutures and staples at our institute.

Materials & Methods

The present study was conducted on 60 patients in the department of General surgery at Sri Aurobindo Medical college and post graduate institute between 1st April 2021to 30th September 2022. Approval of study from Institutional Ethics and Research committees was obtained. All patients were recruited according to inclusion and exclusion criteria. Inclusion criteria such as all patients undergoing elective laparotomy, patients of above the age of 18 years and exclusion criteria such as patients not willing to be the part of this study, patients who undergoing Re-Exploration and patients with immunocompromised status.

The patients were divided into 2 groups. Group I (30) had patients whom abdominal incision close by skin staple and group II (30) had patients whom abdominal incision close by skin suture (monofilament nylon). Parameters such as site of incision, type of wound, time factor, mean closure time, cost and patients acceptance was recorded and compared in both groups. Patients were studied in the post operative day 3rd, 7th,10th, 30th day for wound healing. Descriptive statistical methods used to show the features and characteristics of the collected data. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Groups	Group I	Group II
Method	skin staple	skin suture
M:F	16:14	15:15

Table I shows that group I had 16 males and 14 females and group II had 15 males and 15 females.

Table II Assessment of parameters

Parameters	Variables	Group I	Group II	P value
Site of incision	Midline	12	5	0.04
	Inguinal	5	6	
	Transverse	3	5	
	Paramedian	4	5	
	Subcoastal	2	4	
	Mc Burney's	4	3	
Wound type	A	18	13	0.95
	B	7	9	
	C	5	8	
Time (Sec/cm)		12	42	0.02
Closure time		8	24	0.01
Linear verbal analog pain score		4.7	3.2	0.05
Cost	A	64.2	85.2	0.04
	B	90.5	87.9	
	C	286.2	175.2	
Patients acceptance	Good	27	20	0.03

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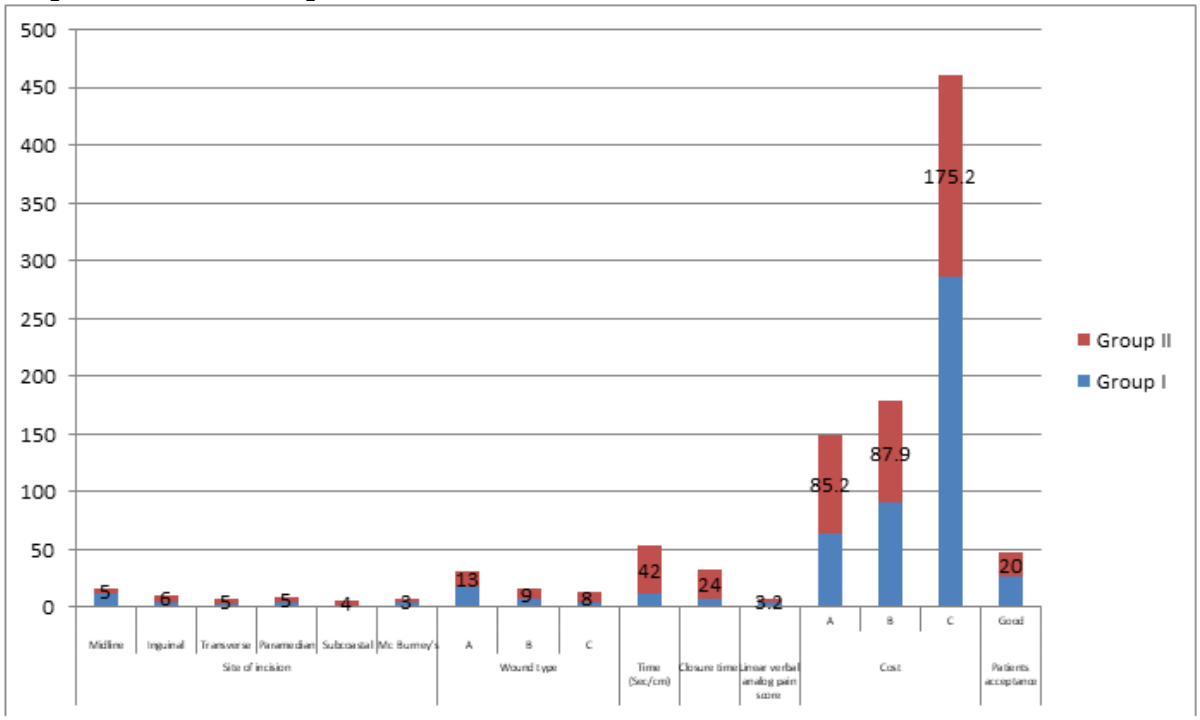
Table II, graph I shows that in group I and group II, site of incision was midline in 12 and 5, inguinal in 5 and 6, transverse in 3 and 5, paramedian in 4 and 5, subcoastal in 2 and 4 and Mc Burney's in 4 and 3 respectively. Wound type was A in 18 and 13, B in 7 and 9 and C in 5 and 8. Time was 12 sec/cm and 42 sec/cm. Closure time was 8 and 24. Linear verbal analog pain score was 4.7 and 3.2. Cost in A was 64.2 and 85.2, in B was 90.5 and 87.9 and in C was 286.2 and 175.2. Patients acceptance was good in 27 and 20 in group I and II respectively. The difference was significant (P< 0.05).

Graph IAssessment of parameters



Discussion

Rapid and aesthetic healing of skin incisions requires accurate reapproximation of wound margins.[7,8] No technique can supersede standard suturing methods for closing. Wounds require the most meticulous repair.[9,10] However, for most linear, non-facial lacerations, staples have been found to have the advantage of being faster, less damaging to host defenses, and useful in the management of potentially contaminated wounds.[11,12]This study was undertaken to study the operative time, the effect on wound healing, cosmetic results, patient's acceptance and total cost with the use of sutures and staples at our institute.

We found that group I had 16 males and 14 females and group II had 15 males and 15 females.Batraet al[13]investigated the merits and demerits of stapled skin closure when compared to conventional sutures in head and neck cancer surgery. A total of 80 patients (40 patients each in control and study group) were enrolled. The patients underwent closure of incision wounds following head and neck cancer surgical procedures. Skin incisions were closed with sutures using 3-0 silk in control group and with stainless steel staples in study group. Both the groups were compared for speed of closure, cost effectiveness, pain on removal, patient comfort, aesthetic outcome on day of removal, 15 and 30 days after day of removal and complications. The mean incision length in control group was 54 ± 16.3 cm while in study group was 53.7 ± 15.4 cm which was statistically not significant (P = 0.95). The mean time of closure in control group was 34.2 ± 12 min while in study group was 3.3 ± 1.2 min which was statistically highly significant (P\0.001). The mean cost of material for

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skin closure in control group was Rs. 270.0 ± 46.4 and in study group was Rs. 517.5 ± 135.7 which was also statistically highly significant (P<0.001).

We found that in group I and group II, site of incision was midline in 12 and 5, inguinal in 5 and 6, transverse in 3 and 5, paramedian in 4 and 5, subcoastal in 2 and 4 and Mc Burney's in 4 and 3 respectively. Wound type was A in 18 and 13, B in 7 and 9 and C in 5 and 8. Time was 12 sec/cm and 42 sec/cm. Closure time was 8 and 24. Linear verbal analog pain score was 4.7 and 3.2. Cost in A was 64.2 and 85.2, in B was 90.5 and 87.9 and in C was 286.2 and 175.2. Patients acceptance was good in 27 and 20 in group I and II respectively. Kathareet al[14] assessed operative time, the effect on wound healing, cosmetic results, patient acceptance and total cost with the use of sutures and staples. The study group included 50 patients who underwent wound closure by staplers and 50 patients underwent suturing. The commonest region of the surgical wounds was McBurneys site. The time taken for wound closure using staplers showed statistically significance difference over closure with suture, it took the stapler 4 times less duration to perform wound closure. The average cost of using stapler was higher than suturing. The appearance of the scar among the staple group was good in 90% of those who returned for follow-up at 1 month, 10% had average scar. The patient acceptance was better in staple group with less pain during removal as compared to suture group.

The shortcoming of the study is small sample size.

Conclusion

Authors found thatstapling is more convenient, time saving and cost effective, routine staple removal is less painful compared to suture removal, so staplers resulted in a substantial and worthwhile saving in time for wound closure.

References

1. Stockley I, Elson RA (1987) Skin closure using staples and nylon suture: a comparison of results. Ann R CollSurg Engl 69:76–78.
2. Medina dos Santos LR, Freitas CAF, Hojaij FC, Filho VJFA, Cernea CR, Brandao LG et al (1995) Prospective study using skin staplers in head and neck surgery. Am J Surg 170:451–452 10.
3. George TK, Simpson DC (1985) Skin wound closure with staples in the accident and emergency department. J R CollSurg Edinb 30(1):54–56 11.
4. Doble A, Clark CLI, Lumley JSP (1991) A comparative study between Michel and Proximate clips for the closure of neck incisions. Ann R CollSurg Engl 73:204–206.
5. Gatt D, Quick CRG, Owen-Smith MS (1982) Staples for wound closure: a controlled trial. Ann R CollSurgEngl 67:318–320.
6. Banwell P, Deakin M, Holden J, Powell B (1997) Removal of skin staples and the use of EMLA cream. Br J Plast Surg 50:144–145.
7. Ridgway DM, Mahmood F, Moore L, Bramley D, Moore PJ (2007) A blinded, randomized, controlled trial of stapled versus tissue glue closure of neck surgery incisions. Ann R CollSurgEngl 89:242–246.
8. Khan AN, Dayan PS, Miller S, Rosen M, Rubin DH (2002) Cosmetic outcome of scalp wound closure with staples in the pediatric emergency department: a prospective, randomized trial. Pediatr Emerg Care 18:171–173.
9. Coupland RM (1986) Sutures versus staples in skin flap operations. Ann R CollSurgEngl 68:2–4.
10. Stillman RM, Marino CA, Seligman SJ (1984) Skin staples in potentially contaminated wounds. Arch Surg 119:821–822.
11. Johnson A, Rodeheaver GT, Durand LS, Edgerton MT, Edlich RF (1981) Automatic disposable stapling devices for wound closure. Ann Emerg Med 10:631–635.

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12. Murphy M, Prendergast P, Rice J (2004) Comparison of clips versus sutures in orthopaedic wound closure. Eur J Orthop SurgTraumatol 14:16–18.
13. Batra J, Bekal RK, Byadgi S, Attresh G, Sambyal S, Vakade CD. Comparison of skin staples and standard sutures for closing incisions after head and neck cancer surgery: a double-blind, randomized and prospective study. Journal of maxillofacial and oral surgery. 2016 Jun;15(2):243-50.
14. Kathare SS, Shinde ND. A comparative study of skin staples and conventional sutures for abdominal skin wound closures. IntSurg J 2019;6:2168-72.