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A Comparative Study Of Skin Staples And Conventional Sutures In All Clean And Clean Contaminated Wound Closure In Elective Surgery.

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ABSTRACT

Today most surgical procedures are assessed by rigorous scientific methods, and such procedures become reproducible and predictable. A variety of techniques and materials are available these days for wound apposition. The present study is a comparative study consists of 200 cases admitted in tertiary care centre Maharashtra during the study from Jan 2021 to July 2022. A 200 cases for the purpose of the study were selected randomly to receive either staples or conventional sutures for clean and clean contaminated skin wound closures in elective surgery. On pain score, group A had score between 1 to 4 and group B had between 5 to 9. Hence, we conclude that skin staplers are superior to sutures for better wound cosmesis, in reducing the post operative pain, wound infection, seroma formation and very much significant in saving time for skin closure. Hence this study recommends the use of skin staplers.

Keywords: skin staples, conventional sutures, wound closure

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INTRODUCTION

Today most surgical procedures are assessed by rigorous scientific methods, and such procedures become reproducible and predictable [1]. A variety of techniques and materials are available these days for wound apposition. The surgeon's preference of a particular technique and material for wound closure depends largely on the biomechanical properties of the material, tissue configuration and the trauma wound properties. Wound closure technique should provide skin apposition till healing occurs, prevent wound infection, provide equal strength throughout the length of the incision, have a good cosmetic result and should be easy and comfortable to use. An ideal wound closure material should be non-allergenic, easy to manufacture and use and cost effective [2-4].

As a general principle, the surgeon should use the finest atraumatic sutures that has adequate mechanical strength. The sutures can be classified into absorbable and nonabsorbable sutures. Non absorbable sutures include Silk, Ethilon etc. Silk: It is braided to give greater tensile strength. It handles and ties well. Interrupted Silk sutures are considered as the gold standard for skin wound closure, although reliable yet conventional percutaneous interrupted Silk sutures are prone to infections. Ethilon: It is synthetic monofilament suture material, black in colour, good memory so little difficult in handling. The knot security is low so one has to apply several knots. Stapler: It is faster, reliable, can be easily handled. The uniform staple shape and constant depth results in even wound tension. It is thought that the use of staples reduces the local inflammatory response, time to wound closure and residual cross marks [5, 6].

For many years it has been possible to approximate the skin edges using sutures. However, sutures have the disadvantages of consuming more time in 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. At the present time cost effectiveness of these is debatable [7]. This study was conducted to study the relevant advantages & disadvantages offered by skin stapler over the conventional skin suturing.

MATERIAL AND METHODS

The present study is a comparative study consists of 200 cases admitted in tertiary care centre Maharashtra during the study from Jan 2021 to July 2022. 200 cases for the purpose of the study were selected randomly to receive either staples or conventional sutures for clean and clean contaminated skin wound closures in elective surgery.

Inclusion criteria

All patients 15 to 70 yr undergoing clean and clean contaminated wound in any surgical process in elective surgery

Exclusion criteria

- Patient with contaminated wound and Infected wound operated in elective surgery.
- All patients operated under emergency surgery.
- Patients who were not followed up in the surgery IPD for at least 6 months after the initial procedure.

Investigations

- Complete hemogram
- Urine routine
- Other relevant specific investigations: Bleeding time, clotting time, platelet count, USG abdomen whenever necessary.

- Group A: All cases undergoing clean and clean contaminated surgical procedures were selected for Staple closure in study period.
- Group B: During the same period, Equal number of cases of conventional skin suturing

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were taken for comparative study.

RESULTS

Table 1: Cosmetic appearance

Cosmetic	Group A	Group B
Good	86	16
Poor	14	84
Total	100	100

Cosmetic appearance among group A was good (86%) and group B showed 16% had good results. Applying chi square test, p value is <0.001, as p value is <0.05, shows statistical significance

Table 2: Complications

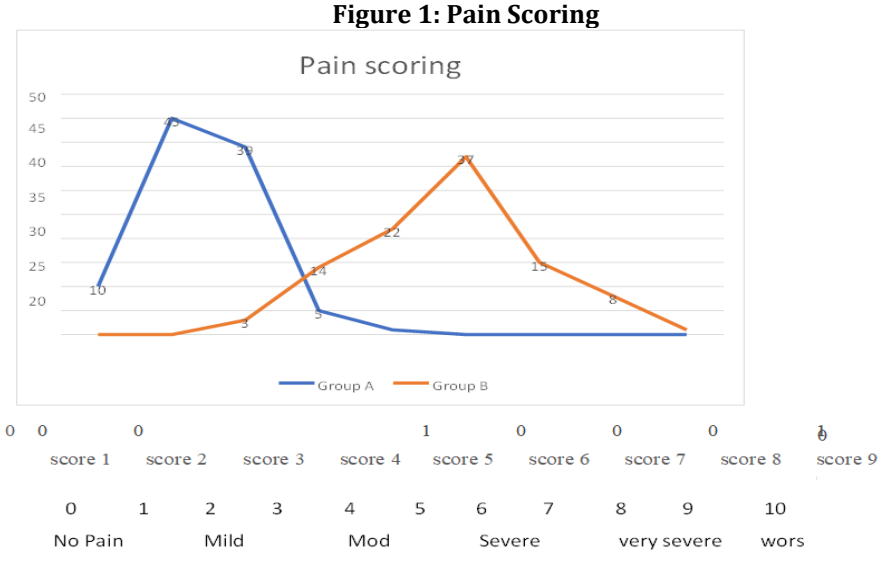
Complications	Group A	Group B
Infected	7	19
Normal	93	81
Total	100	100

7 cases of group A showed complication and 19 cases among group B showed complications. Applying chi square test, p value is 0.005, as p value is <0.05, shows statistical significance.

Table 3: Pain scoring

Pain score	Group A	Group B
1/10	10	0
2/10	45	0
3/10	39	3
4/10	5	14
5/10	1	22
6/10	0	37
7/10	0	15
8/10	0	8
9/10	0	1
Total	100	100

Figure 1: Pain Scoring



On pain score, group A had score between 1 to 4 and group B had between 5 to 9 visual analogue pain score.

Table 4: Patients' acceptance on stapler and suture

Patient acceptance	stapler	suture
Scar (good)	86 %	16%

Patients' acceptance for stapler is 86% and for conventional suture is 16%.

DISCUSSION

Mean age of group A was 44.4 and of group B was 48.2 years. Study by BatraJ et al [8] showed that mean age was 50.6 years. Study by Rabha P et al [9] showed that among stapler group majority were in age group of 36 to 50 years and in suture group were in <35 years age group. Study by Hiremath S et al [10] showed that among both groups' cases were above 40 years of age.

Cosmetic appearance among group A was good (86%) and group B showed 16% had good results. Study by Batra J et al [8] showed that 21 had good scar cosmesis in study group and 117 in control group. Study by Rabha P et al [9] showed that 84% cases had good results in stapler group and 56% in suture group. Study by Hiremath S et al [10] showed that cosmetic appearance was good in staple group than suture group. Study by Rajasenthil V et al [11] showed that overall appearance and wound evaluation was significantly better in the stapler group over the suture group, and patient acceptance was also better in the stapler group.

7 cases of group A showed complication and 19 cases among group B showed complications. Study by Batra J et al [8] showed that study group had minimum . complications only 7 cases had wound dehiscence. Cochetti G et al [12] did a meta- analysis and found that sutures resulted in slightly fewer overall wound infections (4.90%) compared to staples (6.75%) but it is uncertain whether there is a difference between the groups. Study by Hiremath S et al [9] showed that 3 patients had postoperative wound inflammation, out of which 2 patients developed wound infection in the form of purulent discharge on the 6th post-operative day. 1 patient went on to develop wound gape in staple group and 11 patients developed wound inflammation out of which 5 patients developed wound infection and 3 patients had gaping of wound. P value calculated using Mann–Whitney test in suture group. Study by Rajasenthil V et al [11] showed that 3 patients among the 42 patients in the suture group developed skin and subcutaneous infection, and no infections noted in the stapler group, which is not statistically significant.

On pain score, group A had score between 1 to 4 and group B had between 5 to 9. Study by Batra J et al [8] showed that pain score was more for study group than control group. Study by Rabha P et al [9] showed that with stapler the mean pain score in Visual analogue score was 1.44±0.58 (95% CI: 1.27-1.6) whereas with suture the mean pain score in Visual analogue score was found to be 4.58±0.88 (95% CI: 4.3- 4.8). Which was found to be statistically significant ($p<0.001$). Study by Hiremath S et al [10] showed that average Visual analogue score of patients in staple group at the end of 1 month was 71.88 (±5.50) while the average for suture group was 64.44 (±6.17). P value calculated using Student's unpaired t-test.

Study by Rajasenthil V et al [11] showed that pain on post operative day 1 and at times of suture removal were observed and were not statistically significant, but pain on post operative day 3 showed a statistically significant advantage over the suture group.

CONCLUSION

Hence, we conclude that skin staplers are superior to sutures for better wound cosmesis, in reducing the post operative pain, wound infection, seroma formation and very much significant in saving time for skin closure. Hence this study recommends the use of skin staplers.

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