

Comparative Study of Use of Diathermy Versus Scalpel for Incision Making in Midline Laparotomy With Respect to Incision time and Blood Loss

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ABSTRACT

Background: Scalpels are used by surgeons for making incisions. Modern cautery units are used nowadays for making incisions.

Aim: To evaluate and compare use of diathermy and scalpel for incision making in midline laparotomy with respect to incision time and blood loss.

Method: This prospective randomized study was conducted at Surgical Unit1 Fatima Memorial Hospital from January 2017 to December 2018. Patients were categorized into diathermy and scalpel groups and evaluated for incision time and blood loss.

Results: A total of 50 patients were included in the study with 25 (50%) patients in both diathermy and scalpel groups. For incision time, there was no difference found to be statistically significant in the diathermy and scalpel groups but pertaining to blood loss, less blood loss was calculated in diathermy group than in scalpel group.

Conclusion: Diathermy is a primary choice for making incision to minimize blood loss in patients than scalpel. However, considering these options for incision time, none is superior to other.

Keywords: diathermy, scalpel, laparotomy, skin incision, blood loss

INTRODUCTION

General surgeons use scalpel traditionally for making incision. Scalpel use not only cause bleeding but also result in prolongation of operating time¹. Cautery was introduced about a century ago. Its use was limited to haemostasis only². Earlier use of cautery for making incisions was quite questionable to the operating surgeons for fear of burn and delayed wound healing. Several studies have been reported to assert this presumption^{3,4}. But the advent of modern diathermy units, incision making is revolutionised by use of cautery as it results in lesser blood loss by effective haemostasis and reduced operating time^{5,6}. Laparotomy incisions are not only big but take considerable operating time to allow full exposure.

The objective of the study was to evaluate and compare use of diathermy and scalpel for incision making in midline laparotomy with respect to incision time and blood loss.

MATERIAL & METHODS

Our study was a prospective non-randomized study after IRB permission conducted at Surgical Unit 1 of Fatima Memorial Hospital for 2 years from Jan 2018 to Dec 2020. A total of 50 patients were included in this study. All patients, aged between 18 to 70 years of age, of both genders, presenting in both outdoor and emergency requiring laparotomy via midline incision were included. Patients receiving anticoagulation therapy, history of bleeding and clotting disorders, history of previous surgery requiring scar excision were excluded. All patients presenting to surgical unit 1 and fulfilling the inclusion criteria were admitted and worked up for diagnosis. Once diagnosis is confirmed, an informed consent was taken and patients were subjected to midline laparotomy. Patients were segregated into two groups; i.e. scalpel group and diathermy group by consecutive, nonrandomized technique. All surgeries were performed by single surgical unit. For making skin incision in diathermy group, the KLS Martin ME MB31 diathermy unit was used with 120-240 Watts voltage range. The current intensity of cutting was in a range of 5-7 while for coagulation, it was 3-5.A steel scalpel was used for making skin incision in scalpel group. Blood loss during incision was calculated by weighing gauzes and sponges only for the incision postoperatively in a sterile weighing

scale. A stopwatch was used to record time. The time from the beginning of incision till thoroughly opening of peritoneum was taken incision time while maintaining complete haemostasis. The collected data was analysed on SPSS version 21.0. Descriptive data was expressed as mean±SD. Student's t-test was applied to assess difference between two groups. A p value of <0.05 was taken as significant.

RESULTS

A total of 50 patients underwent laparotomy and 25 patients were allocated to each group (50% in each group) in scalpel group median age of patients was 45±9.3 years, while diathermy group median age of patients was 43±10.9 years, which was statistically insignificant as shown in table 1.

Table 1. Age distribution of patients in each groups(N=50)

Group	N	Mean	Standard Deviation	P Value
Diathermy group	25	43.08	11.339	0.516
Scalpel group	25	45	9.309	

The gender wise age distribution of the patients in the study was as shown in table 2.

Table 2: Age distribution according to gender of patients in the study (N=50)

Gender	N	Mean	Standard Deviation	P Value
Male	20	44.75	9.596	0.695
Female	30	43.57	10.900	

When calculated for incision time, there was no difference found to be statistically significant in 2 groups. However, pertaining to calculation of blood loss, less blood loss was calculated in diathermy group than in scalpel group. These findings are summarized in table 3.

Table 3. Diathermy versus scalpel in mid line laparotomy incisions

Operative parameters	Diathermy (25)	Scalpel (25)	P Value
Incision time (mins.)	18.20±6.94	15.48±4.02	0.096
Blood loss (gms.)	10.36±4.37	23.04±7.04	0.0001

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DISCUSSION

We included 50 patients in our study with 25 patients in each group. The two groups were identical without any difference with respect to age and gender of the patients. Owing to burn and poor wound healing, majority of surgeons are reluctant to use diathermy as documented earlier⁷. Johnson and Serpell used diathermy on skin but not on deeper layers of incision⁸. This is in contradiction to our method as we included incision to involve skin, subcutaneous tissue, muscles and peritoneum. We also found that blood loss in diathermy group was significantly lesser than in scalpel group. Kearns et al concurred with our finding⁵. This lesser blood loss is believed to be caused by coagulative sealing of blood vessels in the incision. Regarding incision time, we found that there was no significant difference between the two groups; i.e. it makes no difference on time to make incision whether scalpel is used or diathermy is used. This finding is in contrast to Dixon et al who found diathermy was quicker and faster⁹. This attributed to the fact that extra time was needed to coagulate bleeders in scalpel incisions, which was avoided in diathermy incisions. We found that in expert hands the scalpel and diathermy use do not differ in this regard.

CONCLUSION

Diathermy is a primary choice for making incision to minimize blood loss in patients than scalpel. However, considering these options for incision time none is superior to other.

Authors contribution: AM performed all surgeries. Saba collected the data. Junaid computed the results and wrote the article.

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