

Research Article

Comparative evaluation 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. **Objective:** 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:** This prospective randomized study was conducted at surgical unit 1 Fatima Memorial Hospital Lahore 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.

Key Words: diathermy, scalpel, laparotomy, skin incision, blood loss

INTRODUCTION

General surgeons use scalpel traditionally for making incisions. Scalpel use not only cause bleeding but also result in prolongation of operating time. Cautery was introduced about a century ago.¹ Its use was limited to haemostasis only.² Earlier use of cautery for making incision was 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 with 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.

Objective: 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 conducted in surgical unit 1, Fatima Memorial Hospital for 2 years from January 2017 to December 2018.

Sample size

A total of 50 patients were included in this study

Inclusion criteria

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.

Exclusion criteria

Patients receiving anticoagulation therapy, history of bleeding and clotting disorders, history

of previous surgery requiring scar excision were excluded.

Data collection Procedure

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 for 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 pre- and post-operatively in a sterile weighing scale. A stop watch was used to record time. The time from the beginning of incision till thorough opening of peritoneum was taken as incision time while maintaining complete haemostasis.

DATA ANALYSIS PROCEDURE: All the 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 the 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 diathermy group and scalpel group (50% in each group). In scalpel group, median age of patient was 45±9.3 years while in diathermy group median age of patient was 43±10.9 years which was statistically insignificant (Table 1). Out of 50 patients, 20 were female (40%) and 30 were males (60%). Median age of female patients was 44.7±9.59 years while median age of male patients was 43.57±10.9 years which were found to be statistically insignificant (Table 2). In diathermy group, median age of female patients was 49.1±8.17 years while median age of male patients was 44.8±12.5 years which were found to be statistically insignificant (Table 3). In scalpel group, median age of female patients was 40.4±9.2 years while median age of male patients was 42.2±9.20 years which were found to be statistically insignificant (Table 4).

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

Group	N	Mean	Std. Deviation	p-value
Age (in Diathermy years) group	25	43.08	11.339	0.516
Scalpel group	25	45.00	9.309	

Table 2. Age distribution according to gender of patients in our study (n=50)

Gender	N	Mean	Std. Deviation
Age (in Female years)	20	44.75	9.596
Male	30	43.57	10.900
p-value	0.695		

Table 3. Age distribution according to gender of patients in diathermy group (n=25)

Gender	N	Mean	Std. Deviation
Age (in Female years)	10	49.1	8.17
Male	15	44.8	12.5
p-value	0.743		

Table 4. Age distribution according to gender of patients in scalpel group (n=25)

Gender	N	Mean	Std. Deviation
Age Female	11	40.4	9.2
Male	14	42.2	9.20
p-value	0.818		

When calculated for incision time, there was no difference found to be statistically significant in the two groups (p value=0.096). However, pertaining to calculation of blood loss, less blood loss was calculated in diathermy group than in scalpel group (p=0.000). These findings are summarised in table 5.

Table 5. diathermy versus scalpel in midline laparotomy incision

Operative parameters	Diathermy (25)	Scalpel (25)	p value
Incision time (minutes)	18.20±6.94	15.48±4.02	0.096
Blood loss (gm)	10.36±4.37	23.04±7.04	0.000

DISCUSSION

Owing to burn and poor wound healing, majority of surgeons are reluctant to use of diathermy as documented earlier.⁷ Johnson and Serpell used diathermy on skin but not on deeper layers of the incision.⁸ This is in contrast to our method as we included incision to involve skin, subcutaneous tissue, muscles and peritoneum.

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 in our study. In our study we found that blood loss in diathermy group was significantly lesser than in scalpel group. Kearns et al concurred with our finding.⁵ This lesser blood loss is believed to be caused by coagulative sealing of blood vessels in the incision.

Regarding incision time, we found out that there was no significant difference between the two groups; i.e. it makes no difference on time to make incision whether cautery is used or diathermy is used.

This finding is in contrast to Dixon et al who found diathermy was quicker and faster than scalpel.⁹ This was 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 used do not differ in this regards.

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.

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