



Research Article

A COMPARATIVE ANALYTICAL STUDY OF CUTTING DIATHERMY VERSUS SCALPEL INCISION IN ELECTIVE SURGERIES IN SURGICAL DEPARTMENT S IN TERTIARY HEALTHCARE INSTITUTE

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ABSTRACT

Introduction: Cauterization is a medical term describing burning of body to remove or close a part of it. Electrocauterization or electrocautery is routinely used in surgery to remove unwanted or harmful tissue, i.e., tissue dissection, burn and seal blood vessels, and to create a surgical incision. It is also used increasingly to reduce or stop bleeding. The present study compared cutting diathermy and scalpel incisions in patients with variety of general surgery procedures with respect to the incision time, blood loss, the safety of diathermy the procedure.

Materials and methods: This present analytical study was conducted in the Department of Surgery, KIMS, Karad, Maharashtra, between March 2018 and August 2018 after an approval from institutional ethics committee among 100 cases undergoing elective operative procedures. Total 100 patients who consented to participate in the study were enrolled in the present study. Using randomisation technique, patients were divided into two groups A (Scalpel group) and B (cutting diathermy group).

Results: In the present study, in group A, there were 54% males and 48% female subjects while in group B, there were 52% male cases and 48% female cases. The mean age of patients in scalpel group is 42.2 ± 11.4 and diathermy group is 38.4 ± 11.2 . In the scalpel group; the mean incision time was relatively greater as compared to diathermy group (3.6 ± 0.91 Vs 2.3 ± 0.76 min) and the mean incision blood loss was significantly more among scalpel group as compared to diathermy group (19.17 ± 4.73 Vs 8.51 ± 2.82 ml).

Conclusions: The present study concludes that the use of diathermy for skin incisions in our study subjects is associated with reduced incisional blood loss, incisional time, and hence better efficacy.

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INTRODUCTION

Incision is a “cut or slit” to gain access to the underlying structures. Traditionally, incisions are made with stainless steel scalpel.[1] These incisions are supposed to be more bloody and painful. Electrosurgical devices stand out as some of the most useful and most used instruments in surgeon’s armamentarium.[2]

For many years skin incisions are usually made with disposable knives. But nowadays short wave diathermy is proved most valuable and versatile aid to surgical technique. It is most commonly used to achieving hemostasis by means of coagulation by varying the strength of the current it results in cutting effect. These effects are used in both open surgery and laparoscopic surgery. Cauterization is a medical term describing burning of body to remove or close a part of it.[3]

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surgery to remove unwanted or harmful tissue, i.e., tissue dissection, burn and seal blood vessels, and to create a surgical incision. It is also used increasingly to reduce or stop bleeding.[4] It is achieved

through a small probe with an electric current running through it, that is used to burn or destroy the tissue. However, electrocautery, which is available in all surgical theaters, is less frequently used for skin incisions due to fear of tissue damage, poor wound healing, postoperative pain, and excessive scarring.[5]

Electro-cautery which is widely available in all surgical theatres and are less frequently used for skin incisions for the fear of tissue damage. Majority of studies had compared electrocautery and scalpel incision in terms of wound infection, postoperative pain, blood loss, duration of healing and postoperative wound complication in only selected groups of patients with the exclusion of patients with medical comorbidities.

The present study compared cutting diathermy and scalpel incisions in patients with variety of general surgery procedures with respect to the incision time, blood loss, the safety of diathermy the procedure.

MATERIALS AND METHODS

This present analytical study was conducted in the Department of Surgery, KIMS, Karad, Maharashtra, between March 2018 and August 2018 after an approval from institutional ethics committee.

Total 100 patients who consented to participate in the study were enrolled in the present study. Using randomisation technique, patients were divided into two groups A (Scalpel group) and B (cutting diathermy group).

The exclusion criteria were patients <15 years, contaminated and dirty procedures and patients who could not comprehend the pain scoring index for assessing postoperative pain either due to an altered sensorium or communication barrier.

METHODS

Group A patients had surgical incision made with surgical blade, while group B patients had a surgical incision made with force two valley lab diathermy machine in cutting mode, power of 5W and 515 kHz sinusoidal waveform while Prophylactic intravenous antibiotics were administered at induction of anesthesia. This was ceftriaxone alone or in combination with metronidazole when indicated. The prophylactic antibiotics were repeated for 72 h in clean-contaminated procedures.

The surgical incision in each case was made through skin, subcutaneous tissue, deep fascia, muscle ± aponeurosis and peritoneum or the proposed operation site. The length and depth of each incision were measured using a sterile flexible ruler and the incision time was defined as the start of the skin incision till the intended operation site was reached with complete hemostasis and incisional blood loss being the blood loss that occurred strictly during the period of skin incision and this was calculated as the differences between the dry and wet weight of the swabs (1 mg = 1 ml).

Postoperative analgesia was administered via the intravenous route using Tramadol hydrochloride for all patients on admission, and its oral form was used in day case surgery after an initial parenteral dose.

Statistical data analysis was done using SPSS version 21 manufactured by IBM. Frequencies and proportions were used to summarize the variables while Chi-square and Student's t-test were used to test for association at 5% level of significance.

RESULTS

In the present study, in group A, there were 54% males and 48% female subjects while in group B, there were 52% male cases and 48% female cases. The mean age of patients in scalpel group is 42.2 ± 11.4 and in diathermy group is 38.4 ± 11.2. There were no significant differences between two groups with respect to patient demography.

In the scalpel group; 12 cases were diabetic, 9 cases were hypertensive and 3 cases had history of ischaemic heart disease, while in the diathermy group 13 cases were diabetic, 7

cases were hypertensive and 2 cases had history of ischaemic heart disease.

In the scalpel group; 41 patients underwent elective procedures, and 9 patients had emergency procedures whilst in the diathermy group 43 patients underwent elective procedures, and 7 patients had emergency procedures.

In the scalpel group; 42 patients reported clean post-operative wound and 8 patients reported clean-contaminated post-operative wound while in the diathermy group 43 patients reported clean post-operative wound and 7 patients reported clean-contaminated post-operative wound.

In the scalpel group; the mean incision time was relatively greater as compared to diathermy group (3.6 ±0.91 Vs 2.3±0.76 min) and the mean incision blood loss was significantly more among scalpel group as compared to diathermy group (19.17±4.73 Vs 8.51±2.82 ml).

Table 1 Distribution of cases according to their age

Age group	Group 1	Group 2
Mean Age ± SD	43.6±12.3	41.2±10.4
Minimum age	21	18
Maximum age	69	65
Significance	p-value: 0.1	

Table 2 Distribution of cases according to their mode of presentation

Mode of presentation	Group 1	Group 2
OPD basis	41	43
Emergency department	9	7
Total	50	50

Table 3 Distribution of cases according to their classification of surgical wound

Classification of surgical wound	Group A	Group B
Clean	42	43
Clean-Contaminated	8	7
Total	50	50

Table 4 Distribution of cases according to their outcome parameters

Outcome parameters	Group A	Group B
Incision time (min)	3.6 ±0.91	2.3±0.76
Incisional blood loss (ml)	19.17±4.73	8.51±2.82

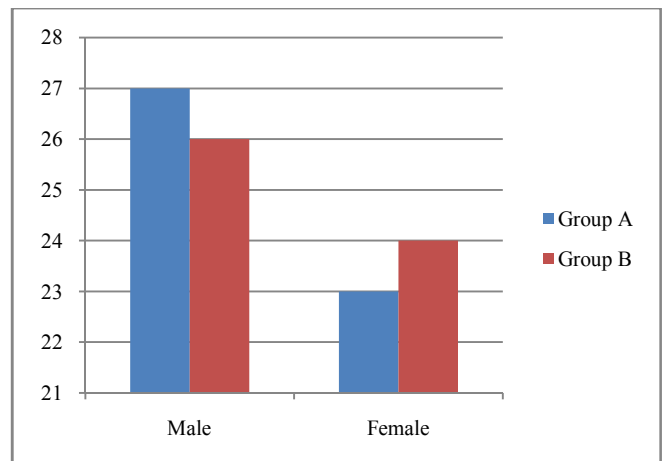


Figure 1 Distribution of cases according to their gender

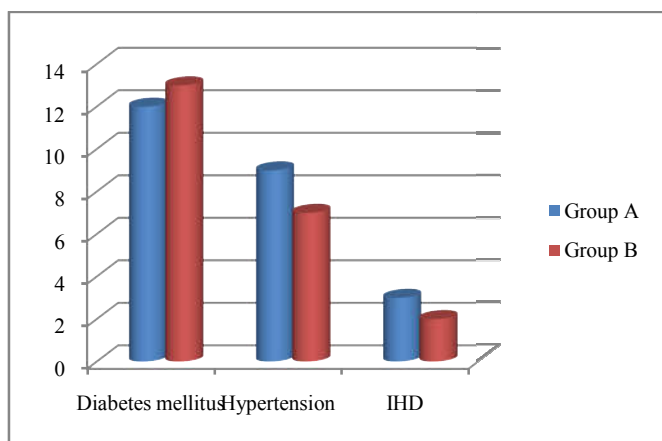


Figure 2 Distribution of cases according to their past medical history

DISCUSSION

The present study was conducted in a department of general surgery in KIMS, Karad, to compare cutting diathermy and scalpel incisions in patients with variety of general surgery procedures with respect to the incision time, blood loss, the safety of diathermy the procedure.

The mean age of patients in scalpel group is 42.2 ± 11.4 and in diathermy group is 38.4 ± 11.2 . There were no significant differences between two groups with respect to patient demography.

In the scalpel group; 12 cases were diabetic, 9 cases were hypertensive and 3 cases had history of ischaemic heart disease, while in the diathermy group 13 cases were diabetic, 7 cases were hypertensive and 2 cases had history of ischaemic heart disease. There were no significant differences between two groups with respect to past medical history.

In the scalpel group; 41 patients underwent elective procedures, and 9 patients had emergency procedures whilst in the diathermy group 43 patients underwent elective procedures, and 7 patients had emergency procedures. There were no significant differences between two groups.

In the scalpel group; 42 patients reported clean post-operative wound and 8 patients reported clean-contaminated post-operative wound while in the diathermy group 43 patients reported clean post-operative wound and 7 patients reported clean-contaminated post-operative wound. There were no significant differences between two groups with respect to post-operative wound classification.

Studies have demonstrated the safety of diathermy incision when compared to scalpel with no difference in terms of wound strength and wound infection. Cochrane data base Sp Rev. 2007 concluded that the use of diathermy approach to vas deferens resulted in less bleeding, hematoma, infection, pain and shorter operating time than traditional incision techniques. Although, both approaches did not differ in their effectiveness.^{[6][7][8][9]}

In the scalpel group; the mean incision time was relatively greater as compared to diathermy group (3.6 ± 0.91 Vs 2.3 ± 0.76 min) and the mean incision blood loss was significantly more among scalpel group as compared to diathermy group (19.17 ± 4.73 Vs 8.51 ± 2.82 ml). There was a

statistically significant difference between two groups with respect to blood loss during incision, it was found more during scalpel group.

Kearns *et al* in 2001 and Shamim in 2009 were able to establish the efficacy of diathermy incision as compared to scalpel incision. They found that diathermy incision resulted in less blood loss, less incision time with reduced need of post operative analgesics in diathermy group with no difference in post operative wound complications and scar formation.^{[10][11]}

Charoenkwank *et al*^[12] in their review could not establish the superiority of electrosurgical incision over scalpel but they did confirm that the use of electrosurgery in making abdominal skin incision is as safe as using scalpel. Another systematic review and meta-analysis revealed that electrocautery is safe and effective while making skin incision, as it significantly reduces incision time, incision blood loss and postoperative pain. Moreover, there was no significant difference in wound infection or scar cosmesis when compared to scalpel.^[13]

CONCLUSIONS

The present study concludes that the use of diathermy for skin incisions in our study subjects is associated with reduced incisional blood loss, incisional time, and hence better efficacy.

Although, the choice of either method remains to rest with the surgeon preference but we advocate that electrocautery can safely be used to make skin incisions without fear of any superficial burns or delayed wound healing.

Conflict of Interest: None to declare

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