



SKIN INCISIONS WITH DIATHERMY AND SCALPEL IN ABDOMINAL SURGERY: A COMPARATIVE STUDY.

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ABSTRACT

Skin incisions are made traditionally with scalpel. The cutting diathermy for making surgical incision has met with scepticism because of possible excessive scarring, impaired wound healing, higher risk of SSI. This study was undertaken to compare the outcomes of diathermy and scalpel skin incisions in patients undergoing varied abdominal surgery in terms of incision time, blood loss, postoperative pain, wound healing, postoperative wound complications and patient's compliance. **Patients and methods:** One hundred patients of either sexes were considered in this prospective, comparative study in patients undergoing abdominal surgeries. The study population was divided into two groups of 50 patients each to compare the outcomes of diathermy and scalpel skin incisions in patients undergoing varied abdominal surgery in terms of incision time, blood loss, postoperative pain, wound healing, postoperative wound complications and patient's compliance. **Results and observations:** The Mean duration of Incision in the Diathermy group was 13.34±5.62 secs and that of Scalpel group was 20.71±6.87 secs with 95% confidence interval of 4.74 – 9.74. Incision time was less in electrocautery group (P <0.001). The mean value of incision related blood loss in electrocautery group was 3.66± 2.15 and scalpel group was 11.58±4.83ml (P <0.001). Post operative pain, complications, scar compliance are comparable in both groups. **Conclusions:** The diathermy is the ideal method of incision in high-risk patients, where both the blood loss and operating time are at a premium. Diathermy incisions heal like that of scalpel incisions and is comparable to each other.

KEYWORDS : Surgical incisions-Diathermy -Scalpel.

INTRODUCTION.

Incision is a cut or slit to gain access to underlying structures. Traditionally incisions are made with stainless steel scalpel knife. Surgical skin incisions can be made with cutting diathermy as well. Making incision with scalpel involves cutting through skin using a sharp blade while cutting diathermy incises skin by generating heat. Reduced blood loss, rapid haemostasis, dry and rapid separation of the tissue, and a possible decreased risk of unintentional damage caused by the scalpel to working personnel are the potential advantages of electro-surgery [1,2]. Despite its several advantages, the idea of diathermy as a cutting instrument instead of a conventional scalpel for making surgical incision has met with scepticism because of excessive scarring, impaired wound healing, higher risk of SSI due to collateral heat damage and necrosis of wound edges. [3,4]. This study was undertaken to compare the outcomes of diathermy and scalpel skin incisions in patients undergoing varied abdominal surgery in terms of incision time, blood loss, postoperative pain, wound healing, postoperative wound complications and patient's compliance.

Patients and Methods:

One hundred patients of either sexes were considered in this prospective, observational, and comparative study in patients undergoing abdominal surgeries in a teaching Hospital during one year period.. Incision wounds in patients undergoing elective & emergency abdominal surgeries. ASA Class I & II patients. Age: 25-65 years were included. Patients on long term steroid and immunomodulator therapy, with previous open abdominal surgery were excluded. The study population was divided into two groups; 50 patients in the group A for diathermy wounds and 50 patients in the group B for scalpel wounds. Comparison between incision time, incisional blood loss, postoperative pain, postoperative complications and Scar Characters in both the groups were compared. Incisional blood loss was determined with gauze swabs used during the incision and haemostasis. The weight of the gauze was done to calculate incisional blood loss. 1 ml of blood loss corresponds to 1 gm difference between dry and soaked gauze and blood loss per unit wound area was

calculated as ml/cm2. Wound related pain was assessed using verbal analogue scale on three consecutive postoperative days. Clinical assessment of the wound was done for 3-7-10 postoperative days for wound related complications like Hematoma, Seroma, Purulent Discharge, wound dehiscence. ASEPSIS score was used to assess wound infection (5). Subjective evaluation was carried out to determine the patient satisfaction and acceptability of the aesthetic outcome. Statistical analysis performed using spss 18 software, chi-square test, Fischer exact test was performed. p value of <0.05 was considered as significant.

RESULT AND OBSERVATIONS:

Among both groups, the youngest patient was aged 25 years and the oldest patient was 65 years old. The most common age group in the study was between 35-50 years. There were 27 males and 23 females in the Diathermy group, while there were 26males and 24 females in the Scalpel group. The maximum length of incision was 12 cm and minimum length was 5cm in Diathermy group (Mean 8.7cm). In the Scalpel group the maximum length of incision was 12.5 cm and the minimum length was 5.8cm (Mean8.5cm). The Mean duration of Incision in the Diathermy group was 13.34±5.62 secs and that of Scalpel group was 20.71±6.87 secs with 95% confidence interval of 4.74 – 9.74. Incision time was less in electrocautery group than in scalpel incision group with a statistically significant difference. (P value <0.001). The mean value of incision related blood loss in electrocautery group was 3.66± 2.15 and scalpel group was 11.58±4.83ml. The P value was found to be <0.001. Verbal rating scale (VRS) was used to assess post-operative pain for 3 days. It was divided into no pain, mild, moderate and severe pain.

Table 1: Post operative results of both groups of patients

Descriptions	Diathermy	Scalpel	P Value
Incision time (Sec)	14	21	<0.001
Blood loss(mean)	4ml	12ml	<0.007
Post Operative pain(N)	38	30	0.284
Wound complications (N)	17	12	>0.05
Scar Compliance	48	47	0.800

In the present study 17(34%) in skin incision with Diathermy had postoperative complications as compared 16(32%) patients in the Scalpel group It was found to be statistically insignificant. ($p>0.05$). In this study patient acceptance for wound appearance is not statistically significant as p value is 0.800(Table 1).

DISCUSSION:

The diathermy incision technique is now becoming extremely popular because of rapid haemostasis, faster dissection and for reduced overall operative blood loss. [6,7]. This hesitation to make skin incisions with diathermy was due to the belief that diathermy increases devitalized tissue within the wound, which may cause wound infection and result in scar formation. However, pure sinusoidal current delivered by oscillator units has increased the interest in electro surgery. Preliminary studies on electrosurgical procedures with diathermy demonstrated that it was associated with only charring of skin [8].

The current study demonstrated that blood loss was significantly minimal in the diathermy group compared to the scalpel group (9,10,11). This study found that the electrocautery incisions were significantly superior to scalpel incisions with respect to incision time and incision related blood loss [12]. Incision time and incision related blood loss in the electrocautery group is significantly less in comparison with that of steel scalpel group which was similar to other study [10]. The incision time was significantly longer for scalpel group which was similar to the results obtained in other studies [8,12]. Post operative pain perception was significantly low with diathermy [8]. In the present study no such significant difference in post-operative pain found between the two groups. Incisions made with a steel scalpel resulted in a lower percentage of surgical site infection than incisions produced with electrocautery.[13]. The risk of post-operative wound infection was identical in both scalpel and electrocautery groups and was statistically insignificant.[14]. No significant difference was observed in the scar between the scalpel and diathermy group. The present study also corroborated with the other studies [15,16,17,18]. Incision by scalpel with electrosurgical needle incision had shown the later technique to be highly effective, to be consistently quicker, and to give better cosmetic results with minimal complications.[52]. It is a convenient technique and well tolerated by patients with no added discomfort.

CONCLUSIONS:

The diathermy is the ideal method for incision in high-risk patients, where both the blood loss and operating time are at a premium. Diathermy incisions heal like that of scalpel incisions. It is safe and efficient and has tremendous potential in all surgical fields.

Limitation:

The sample size small and it's a single centre study. A large-scale randomized trials with larger sample size would have been appropriate to assess the clinical and cosmetic outcome between diathermy and scalpel groups.

Conflict of interest: None

Ethical Issue: None

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