

A Clinical Study of Efficacy of Diathermy Incision Vs Scalpel Incision in Patients Undergoing Open Hernia Surgery

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ABSTRACT

Introduction:

An incision is a slit or cut used to get access to deeper tissues. Electro cautery is a medical procedure that involves burning a specific portion of the body to remove or close it. Although worries of severe scarring and slower wound healing have limited its use for skin incision, electro- cautery is becoming increasingly often used for tissue dissection.

Materials and Methods:

In this prospective randomised study, 60 patients undergoing mesh plasty for inguinal hernia were divided into two groups. In Group A, a skin incision is produced using electrocautery, while Group B uses a scalpel. The two groups are compared in terms of postoperative discomfort, wound complications, and the use of analgesics. Finally, the Mann-Whitney U Test is used to assess and compare the results for the two groups.

Results:

Pain will be measured six, twelve, and twenty-four hours after surgery using a graphical visual analogue scale. In the event that the pain score exceeds 4, INJ.DICLOFENAC 50 mg IM will be administered. In the post-operative phase, complications recorded in hospital stay are quantified by means of Seroma- discharge of serous collection at suture site, and Hematoma- blood collection.

Conclusion:

The outcomes of both groups, namely the diathermy and Scalpel groups, have been proven to be equivalent based on the findings of this research of the following:

- 1) postoperative pain,
- 2) the need for analgesics, and
- 3) wound complications after surgery.

Keywords: Inguinal hernia, Prolene Mesh, Diathermy, scalpel, Pain, Seroma, Hematoma.

Introduction

An incision is a slit or cut made to get access to deeper tissues. Electro cautery is a medical word that refers to the act of burning a bodily component in order to eliminate or shut it down.¹ Although worries of severe scarring and poor wound healing have limited its use for skin incisions, electrocautery is becoming increasingly popular for tissue dissection.^{2,3} Incisions are often created using a stainless steel scalpel. These incisions are said to be bloodier and more painful. Many new treatments, such as cavitron electron and laser surgical aspirator, have been created to solve this problem, but the cost of these technologies is exorbitant, and they are seldom accessible in our hospital.^{4,5}

Electro-cautery, which is available in all operating rooms, is used less often for skin incisions. Concerns include tissue injury and post-operative problems such as discomfort and scars. According to current advancements and research, electrocautery may be utilised for skin incisions with no postoperative complications such as wound infection or scarring, as well as decreased postoperative discomfort.^{6,7} The purpose of this research is to remove the surgical community's concerns about using electrocautery for skin incisions.

AIM

The aim is to compare post-operative discomfort and complications in electro-cautery and scalpel incisions over skin in patients having open hernia operations.

MATERIAL AND METHODS

The current comparative research was done DD MCH, KEONJHAR. In this prospective randomised study, 60 patients undergoing mesh plasty for inguinal hernia were divided into two groups. In Group A, a skin incision is produced using electrocautery, while Group B uses a scalpel. The two groups are compared in terms of postoperative discomfort, wound complications, and the use of analgesics. Finally, the Mann-Whitney U Test is used to assess and compare the results for the two groups. Ceftriaxone 1 gramme is given 30 minutes before the operation as a premedication. All procedures are conducted under uniform spinal anaesthesia, with all incisions being medial, 2.5cm above, and matching to the inguinal ligament. The abdominal layer is closed using continuous vicryl for external oblique aponeurosis, intermittent vicryl for subcutaneous tissue, and a vertical mattress suture with 2-0 ethylon for skin closure.

Inclusion Criteria:

- Patients of age >12yrs & <70yrs
- Uncomplicated INGUINAL hernias (reducible hernias only)

Exclusion Criteria:

- <12yrs & >70 yrs.
- Emergency surgery, peritonitis, bowel obstruction, strangulation, perforation
- Patient unfit for surgery (both laparoscopic and open repair)
- Irreducible ventral hernias

- Recurrent hernia
- Multiple scars on the abdominal wall, which make intra peritoneal access difficult
- NOT willing to give consent
- Immunocompromised patients (AIDS)
- Severe systemic failure like hepatic, renal, cvs dys-function.
- Diabetes mellitus

Statistical Analysis and Results:

1. Patient Demographics:

- Patients with inguinal hernias totaling 60 are separated into two groups: electrocautery and scalpel for skin incision. Table -1 shows that there was no clear demographic difference between the two groups. The average age of patients in group A (electrocautery) is 46.46 ± 15.45 , whereas in group B (scalpel) is 46.63 ± 13.82 .

Table 1: Age: (Mean±SD)

	Electrocautery	Scalpel
Age	46.46 ± 15.45	46.63 ± 13.82

Table -1 $t = 0.045$ $DF = 58$ $P = 0.96$

- Post-operative pain:** Post-operative pain is evaluated by VAS (visual analogue scale) at 6 hours, 12 hours and 24 hours respectively in the postoperative periods. The Mann Whitney U Test was used to analyze the data in our study, and the results are shown in table 2. Between the two groups, there is no discernible difference.

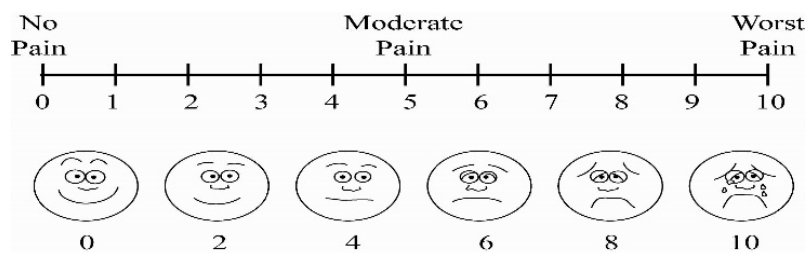
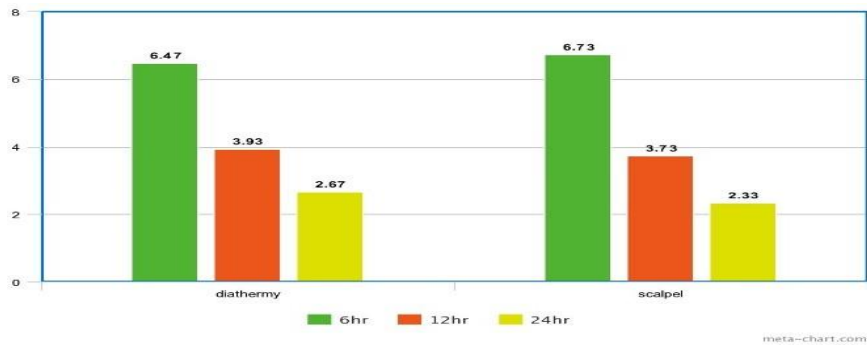


Figure 2: VAS (Visual Analogue score)

Table 2 Pain Score:

Time	Electrocautery		Mann-Whitney U test
6 hours	6.47 ±0.921	6.73 ±0.727	P = 0.229
12 hours	3.93 ±0.891	3.73 ±0.679	P = 0.332
24 hours	2.67 ±0.760	2.33 ±0.596	P = 0.058



Graph 2: Pain Score comparison

4. Requirement of analgesics in post-operative period:

The dose of painkiller, INJ DICLOFENAC 50 mg IM, was recorded in both groups after surgery, and the findings are presented in table 3. The Mann Whitney U test was used to examine the results. In both groups, the dosage requirements are similar.

Analgesic Doses: (Mean±SD)

- P = 0.682
- X2 with Yate’s correction = 0.1307 DF = 1 P = 0.717688
- DF = Degrees of freedom
- X2 = Chi-square

Even though scalpel group appears more hematoma, difference is not statistically important.

Other complication i.e purulent collection in post-operative wound is similar in two group

5. Wound complications

Overall wound problems are monitored for seven days after surgery.

We looked at problems including seroma, hematoma, and purulent collection in our study

Table 4a:

Groups	Yes	No	Total
Electrocautery	2(6.6%)	28	30
Scalpel	6 (20%)	24	30

X² with Yate's correction = 2.3077 DF = 1 P = 0.128

A. Seroma

Table 4b:

Group	Yes	No	Total
Electrocautery	8(26.6%)	22	30
Scalpel	9(30%)	21	30

X² with Yate's correction = 0.0821 DF = 1 P = 0.7744

B. Purulent Collection

Table 4c:

Group	Yes	No	Total
Electrocautery	4 (13.3%)	26	30
Scalpel	5 (16.6%)	25	30

Discussion

The electrosurgical unit (ESU) is the most popular kind of electrical equipment in contemporary operating rooms. Many research have indicated that diathermy is increasingly being utilised for creating skin incisions, establishing hemostasis, and dissecting tissue planes. It improves hemostasis, reduces total intraoperative time, and produces a wound that heals similarly to a Scalpel wound.^{8,9} Despite these advantages, surgeons' use of it for skin incisions in impoverished nations, including ours, remains inadequate. We can bring to a lack of research. The presence of this group of patients at this area, as well as an obsolete idea that diathermy produces skin incisions, increases the quantity of devitalized tissue in the wound. Surgeons often avoid using diathermy for skin wounds owing to concerns about delayed wound healing, infections, and severe scarring. The current hospital-based randomised control experiment was therefore done to evaluate diathermy with steel scalpel skin incisions in inguinal hernia repair in terms of: incision time, incisional blood loss, post-operative discomfort, and post-operative wound complications.^{10,11,12}

The average age of study individuals having hernia repair was 48.0 years, with mean ages of 50.1 and 45.9 years for the scalpel and cautery groups, respectively. The mean BMI for the scalpel and cautery groups was 25.8 and 25.3 kg/m², respectively. Both groups had similar baseline demographic factors. Cautery resulted in a considerably lower mean incisional time (7.04 ± 0.88 sec/cm²) compared to scalpels (8.41 ± 1.39 sec/cm²; p<0.01). Compared to the Scalpel, diathermy resulted in decreased blood loss (1.17 ± 0.67 ml/cm² vs. 1.84 ± 0.89 ml/cm²; p<0.01). The cautery group had a substantially lower mean VAS (visual analogue score) than the scalpel group at 6, 12, and 24 hours (p<0.01). According to this research, the diathermy group had

much less postoperative discomfort than the control group. This is because diathermy's heat affects sensory nerve fibres, causing nerve impulse transmission to be interrupted. The application of a pure sinusoidal current produces cell vaporisation, resulting in fast tissue and nerve necrosis without causing damage to surrounding tissues. As a consequence, patients with diathermy skin incisions have entire or partial damage to the cutaneous nerves in the region of the surgical wound, with a lower postoperative pain profile.

Seroma and hematoma development were seen in 45 (18.2%) and 23 (9.1%) individuals in the Scalpel group, compared to 53 (21.2%) and 15(6.1%) in the cautery group ($p>0.05$). Purulent collection revealed surgical site infection in 23 (9.1%) of the Scalpel group compared to 38 (15.2%) of the cautery group ($p=0.078$). Surgeons have long sought the best way of producing a skin incision that allows for speedy and adequate exposure while minimising blood loss. Diathermy is mostly used for hemostasis and skin incisions. In our prospective research, 60 patients were randomly allocated to one of two groups, incisions are produced using a Scalpel or diathermy depending on the group, and patients are examined postoperatively for pain, analgesia needs and postoperative wound problems.

This study found no difference in postoperative pain, analgesic need, or wound complications between the two groups.

Conclusion

The outcomes of both groups, namely the diathermy and Scalpel groups, have been verified to be equivalent based on the following findings of this study:

1. Post-operative pain.
2. Need for analgesics.
3. Wound issues after surgery.

The diathermy group (46.46±15.45) and scalpel group (46.63±13.82) had comparable age distributions ($P = 0.96$). Post-operative pain levels are comparable in both groups. Although the hematoma in the Scalpel group is larger, the difference is not statistically significant. Postoperative seroma and purulent collection are comparable in both groups. Based on the findings of this research, we recommend that diathermy be used more broadly in all surgical procedures to create skin incisions since it is a reasonably safe strategy.

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