



A Study Comparing the Results of Diathermy Incision Versus Scalpel Incision in Patients Undergoing Inguinal Hernioplasty

KEYWORDS

electrocautery, diathermy, scalpel, skin incision

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ABSTRACT *Electrosurgery is a fast developing facet of surgery but still most surgeons are not comfortable with making skin incisions using electrocautery. They prefer the scalpel due to the belief that electrocautery devitalizes tissues and causes poor tissue healing and more complications. This study was undertaken to explore this myth and compare the post-operative complications of incisions by scalpel and incisions by cautery.*

INTRODUCTION

Surgeons have always been in search of an ideal method of making a skin incision which would provide quick and adequate exposure with minimum loss of blood. Electro-surgery has been used extensively since its introduction in 1929, and has now become an indispensable tool in every operating room, especially with the advent of non-explosive anesthetic agents.

The reluctance to incise skin with diathermy is partly attributable to the belief that electrosurgical instruments increase devitalized tissue within the wound, which consequently lead to wound infection, increased scar formation and delayed wound healing.

We have undertaken this study to compare the post-operative complications and healing with incisions given by scalpel and electrocautery in patients undergoing inguinal hernia repair.

METHODOLOGY

The study was conducted at the Department of General Surgery at Osmania General Hospital, Hyderabad, between September 2013 and August 2014. A total of 60 patients were randomised into two groups, Group A (Electrocautery group) and Group B (Scalpel group) with 30 patients each.

Inclusion criteria: All cases of elective uncomplicated inguinal hernia repair.

Exclusion Criteria:

- Age <16 years and >65 years.
- History of alcohol or narcotic abuse.
- Severe hepatic, renal, cardiac dysfunction.
- Diabetes mellitus and immunocompromised status.
- Previous scars, recurrent hernia cases.

Lichtenstein tension free hernioplasty was performed in all patients.

In Group A- Skin incision was taken with electrocautery probe (diathermy) using pulse sine wave current and power setting of 70 watts. In Group B- Skin incision is taken with scalpel. In both groups, bleeding was controlled by forceps coagulation using pulse sine wave on power supply 30 watts.

Premedication was given with injection Ceftriaxone 1gm intravenously, one hour before the surgery.

All incisions were made on medial 3/5th of groin region, 2.5cms above and parallel to inguinal ligament. All the procedures were done under spinal anesthesia.

PARAMETERS STUDIED:

Postoperative pain was assessed by the number of doses of injection Diclofenac 50 mg intramuscular required by the patient.

During post-operative period (upto 7 days) complications like development of Seroma, Haematoma and Purulent collection were noted.

RESULTS

Results were analyzed using Mann Whitney U test and Chi square test. The observer was blinded as to which group a particular patient belongs to.

Mean age of patients in group A i.e., Electrocautery group is 47.8±16.21 and in group B i.e., Scalpel group is 47.7±13.95; no significant difference.

Post operative pain: There is no significant difference between two groups. Analgesic dose requirements were similar in two groups.

Local wound complications:

Overall wound complications were assessed for 7 days post operatively.

The incidence of hematoma in Electrocautery group was 3.3% as opposed to 20% in Scalpel group (p= 0.108).

The incidence of purulent collection in Electrocautery group was 13.3% and 16.6% in Scalpel group.

DISCUSSION

The verb 'to cauterize' known in English since 1541; from Greek *kauteriazain* "burning or branding iron".

Thermal cautery was used in centuries as early as 3000 BC, where battle wounds were treated with heated stones or swords. The development of the first commercial elec-

tro-surgical device is credited to Dr. William T. Bovie, who developed the device during the period of 1914 to 1927 while employed at Harvard University¹. The first use of an electrosurgical generator in an operating room occurred on October 1, 1926 by Dr. Harvey Williams Cushing.

Three types of tissue effect that occur due to radiofrequency current are: vaporization (cutting), desiccation (coagulation), and fulguration (superficial coagulation).

Several studies have been undertaken to compare electrocautery incision with scalpel incision.

In the Sher E. Kehir Institute of Medical Sciences, Srinagar², a prospective study among 240 female patients undergoing cholecystectomy was done. Results of pain assessment at 24 hr post surgery showed significantly less pain appreciated in electrocautery group. Wound hematoma and seroma were more in the scalpel group but difference was not statistically significant. No cases of wound disruption after 6 weeks were observed.

S.R. Kearns et al³ studied diathermy versus scalpel incision in patients undergoing midline laparotomy incision. They had observed that incision with diathermy is faster with less blood loss and lower post operative pain with no significant difference in wound and post operative complications.

Chrysos E. et al, compared diathermy and scalpel incision in tension free inguinal hernioplasty⁴. It was found that blood loss did not differ between two groups. Diathermy group received less analgesics with no difference noted in wound strength and infections were totally absent in both groups.

Kearns et al⁵ in another study concluded that the use of diathermy for skin incision is associated with lesser early postoperative pain and less analgesia requirement. Ahmad

et al. also noted similar findings that postoperative pain was significantly less with diathermy incisions in first 24 hours.

A meta-analysis comparing cutting diathermy with scalpel incisions reveals no difference in wound complications or postoperative pain. The researchers note that scalpel incision involves several instrument exchanges with coagulation diathermy, which could explain the increase in incision time and blood loss during surgery. The risk for sharps injury from the use of scalpels is the most compelling reason to use cutting diathermy instead, the authors write. They note that injuries from scalpels account for 18% of surgical staff cutting injuries, second only to injuries from suture needles, which account for 41% of staff cutting injuries.

Most importantly recent increase in blood borne infections like Hepatitis C, Hepatitis B, and Human immune deficiency virus infection supports the exclusion of scalpel from operative field.

CONCLUSION

Based on observations made in our study, it has been concluded that results of both groups, i.e., electrocautery group and scalpel group are similar in relation to Postoperative pain, Requirement of analgesics and Postoperative wound complications.

We recommend a wider use of electrocautery for skin incision in all surgical procedures, as excessive handling of sharps by the surgical staff is avoided. Traditional fear of wound strength and devitalisation are not reflected in this study.

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