

Incision Pain: A Comparison Between Use of Diathermy Versus Scalpel in Patients Undergoing Elective Abdominal Surgery

Ghansham,^{1*} Sagheer Hussain Shah,¹ Zeeshan Hyder¹

ABSTRACT

Objective To compare the mean postoperative wound pain score in diathermy (cutting) versus scalpel made skin incisions in patients undergoing elective abdominal surgery.

Study design Randomized clinical trial.

Place & Duration of study Department of Surgery Jinnah Postgraduate Medical Center Karachi, From February 2015 to August 2015.

Methodology Patients who underwent clean elective abdominal surgery were randomly assigned into either group A (diathermy incision) or group B (scalpel incision). Antibiotic prophylaxis was given at the time of induction of anesthesia. Postoperatively 20ml bupivacaine (0.25%) was infiltrated into the wound and regular dose of diclofenac sodium was given. Patients were assessed for pain by numerical analogue scale at the end of 48 hours after surgery.

Results A total of 60 patients were included. They were divided into group A and B with 30 patients in each group. Mean postoperative wound pain score was significantly low in group A than groups B (1.30 ± 0.98 vs. 1.97 ± 0.81 ; $p=0.0006$).

Conclusion Cutting diathermy is safe and effective method to make skin incision in elective abdominal surgeries and has significant advantage over scalpel skin incision in relation to postoperative pain.

Key words Laparotomy, Scalpel, Diathermy, Postoperative pain.

INTRODUCTION:

Abdominal surgeries are associated with number of complications that may range from simple wound infection to wound dehiscence and incisional hernia.¹ Postoperative pain is one of the significant complaints after surgery. Pain in immediate postoperative period increases morbidity and delays recovery. Good pain control helps in alleviating patient's distress and also reduce the stress response.²

¹ Department of Surgery, Jinnah Postgraduate Medical Centre, Karachi

Correspondence:

Dr. Ghansham^{1*}
Department of Surgery
Jinnah Postgraduate Medical Center Karachi
E mail: drsham84@hotmail.com

The standard practice is to use scalpel to make surgical incision. Diathermy and more recently the harmonic scalpel have been used for making the skin incision. In diathermy a high frequency current passes through the tissues and produces heat energy.³ Harmonic scalpel uses high frequency ultrasonic waves resulting in desiccation the tissues.⁴ The use of diathermy has increased as it is found efficient with less bleeding. This also saves time. It is also associated with less postoperative pain.⁵⁻⁷ In one study it was reported that the use of diathermy for making skin incision does not increase the frequency of wound infection.⁸

Recent literature review also favors the use of diathermy for making safe laparotomy skin incision.⁹ The rationale of this study was to provide supporting local evidence for the use of this simple technique

by determining the mean postoperative pain and its effect on recovery in patients undergoing abdominal surgeries using diathermy versus scalpel skin incisions.

METHODOLOGY:

This was a randomized clinical trial carried out at Department of Surgery Ward 26, Jinnah Postgraduate Medical Center Karachi, from February 2015 to August 2015. All patients between the age of 13 and 60 year, with ASA I to III, undergoing an elective abdominal surgery were recruited. Patients with diabetes mellitus, previous abdominal surgery and emergency surgery were excluded. Patients were assigned into either group A (diathermy incision) or group B (scalpel incision) by random allocation. Antibiotic prophylaxis was given at the time of induction of anesthesia. All patients had their wound infiltrated with 20 ml of bupivacaine (0.25%) at the end of procedure. Diclofenac sodium 75mg intramuscular injection, 8 hourly was given postoperatively for pain. Patients were assessed for pain by numerical analogue scale at the end of 48 hours of surgery. Patients were asked to point the value on the scale according to the severity of pain perceived.

A proforma was used to document findings. To minimize the bias, all the patients was examined by an independent observer who was unaware of the group allocation, to fill the proforma. Statistical analysis was performed by using SPSS for Windows version 16. Mean ± standard deviation was used to

describe the numerical data like age and postoperative pain scores. Frequencies and percentages were used to summarize categorical data like gender and mobilization status. Unpaired student t-test was applied to compare the mean difference of postoperative pain scores between the two groups. Statistical significance was taken at $p < 0.05$. Stratification was done with regard to age, gender and mobility of the patient to control effect modifiers and t test was applied after stratification.

RESULTS:

The mean age of the patients in group A was 33.35 ± 4.68 year and in group B was 33.67 ± 4.85 year. There were 31 (51.7%) male and 29 (48.3%) female patients. Mean postoperative wound pain score was significantly low in group A than groups B (1.30 ± 0.98 versus 1.97 ± 0.81 - $p=0.0006$). This is shown in table I. Stratification of results according to gender and age are given in table I and II.

DISCUSSION:

Diathermy has been used for tissue dissection and hemostasis.^{10,11} However surgeons were reluctant to use it for making skin incision.¹¹ This was due to the studies which showed that the use of diathermy causes devitalization of tissue within the wound which consequently lead to wound infection, delayed wound healing and excessive scarring. This has been challenged by randomized clinical trials. These studies showed that diathermy is a safe option with other advantages.^{7,11} Despite this evidence many surgeons still advocate the use of scalpel in making

Table I: Mean Postoperative Wound Pain Score Between Groups By Gender

Gender	Groups	n	Pain Score		p-value
			Mean	Standard Deviation	
Male	Group A	17	1.12	1.05	0.026
	Group B	14	1.93	0.82	
Female	Group A	13	1.54	0.87	0.06
	Group B	16	2.19	0.91	

Table II: Mean Postoperative Wound Pain Score Between Groups by Different Age Groups

Age Groups	Groups	n	Pain Score		p-value
			Mean	Standard Deviation	
< 35 Year	Group A	20	1.0	0.22	0.05
	Group B	19	0.87	0.20	
>35 Year	Group A	10	0.90	0.87	0.01
	Group B	11	2.0	0.89	

skin incisions.¹² This study was conducted in Pakistani context as many surgeon are still quite reluctant to use diathermy for incision. The results are encouraging and addresses the skepticism of the surgical fraternity.

Ahmed NZ et al in his meta-analysis concluded that diathermy incisions are equally prone to get wound infection as do the incisions made with scalpel. Further more, lower incidence of early postoperative pain, swiftness of the technique, and a reduced blood loss are the encouraging facts supporting the routine use of diathermy for abdominal skin incisions after taking careful precautions.⁵ Ly J et al found in their study that postoperative pain scores at 24 hours were not significantly different between cutting diathermy and scalpel groups.⁷ Some clinical studies have reported reduced pain at 48 hours when cutting diathermy was used for skin incision.^{6,9} However more recent studies found no difference in postoperative pain perception.¹¹

The fear of tissue injury in diathermy incision was first unfolded when this technique was used by Peterson in reconstructive and cosmetic faciomaxillary surgery and Mann and Klippel in pediatric surgery with minimum scarring and excellent results.^{13,14} Ali et al in their study concluded that diathermy can safely be used to make skin incision.¹⁵ Kearns et al who compared electrosurgical and scalpel methods in hundred patients undergoing elective midline incision have indicated that the diathermy incision had significant advantages over scalpel incision based on incision time, blood loss, early postoperative pain and analgesia requirements.⁹ Same were the findings of our study.

CONCLUSIONS:

Significant difference in mean postoperative wound pain on day 2 was observed in diathermy versus scalpel skin incisions. Diathermy is thus a safe and effective method to make the skin incision.

REFERENCES:

1. Halm JA, Lip H, Schmitz PI, Jeekel J. Incisional hernia after upper abdominal surgery: a randomised controlled trial of midline versus transverse incision. *Hernia*. 2009;13:275-80.
2. Akhtar MI, Saleem M, Zaheer J. Wound infiltration with Bupivacaine versus Ketorolac for postoperative pain relief in minor to moderate surgeries. *J Pak Med Assoc*. 2009;59:385-8.

3. Marwah S, Marwah N, Singh M, Kapoor A, Karwasra RK. Addition of rectus sheath relaxation incisions to emergency midline laparotomy for peritonitis to prevent fascial dehiscence. *World J Surg*. 2005;29:235-9.
4. Oztgün H, Tuncyurek P, Boylu S, Erpek H, Yenisey C, Köse H, et al. The right method for midline laparotomy: what is the best choice for wound healing? *Acta Chir Belg*. 2007;107:682-6.
5. Ahmad NZ, Ahmed A. Meta-analysis of the effectiveness of surgical scalpel or diathermy in making abdominal skin incisions. *Ann Surg*. 2011;253:8-13.
6. Shamim M. Diathermy vs. scalpel skin incisions in general surgery: double-blind, randomized, clinical trial. *World J Surg*. 2009;33:1594-9.
7. Ly J, Mittal A, Windsor J. Systematic review and meta-analysis of cutting diathermy versus scalpel for skin incision. *Br J Surg*. 2012;99:613-20.
8. Ali Q, Siddique K, Mirza S, Malik AZ. Comparison of superficial surgical site infection following use of diathermy and scalpel for making skin incision in inguinal hernioplasty. *Niger J Clin Pract*. 2009;12:371-4.
9. Kearns SR, Connolly EM, McNally S, McNamara DA, Deasy J. randomized clinical trial of diathermy versus scalpel incision in elective midline laparotomy. *Br J Surg*. 2001;88:41-4.
10. Cushing H. Electrosurgery as an aid to the removal of intracranial tumors with a preliminary note on a new surgical current generator. *Surg Gynecol Obstet*. 1989;64:751-84.
11. Siraj A, Farooq-Dar M, Gilani AB, Raziq S. Elective midline laparotomy: Comparison of diathermy and scalpel incisions. *Professional Med J*. 2011;18:106-11.
12. Kumar V, Tewari M, Shukla HS. A comparative study of scalpel and surgical diathermy incision in elective operations of head and neck cancer. *Indian J Cancer*. 2011;48:216-9.

13. Peterson A. The use of electrosurgery in reconstructive and cosmetic maxillofacial surgery. *Dental Clin North Am.* 1982;20:799-823.
14. Mann W, Klippel CH. Electrosurgical skin incisions. *J Pediatr Surg.* 1977;12:725-6.
15. Ali Q, Siddique K, Mirza S, Malik AZ. Comparison of superficial surgical site infection following use of diathermy and scalpel for making skin incision in inguinal hernioplasty. *Niger J Clin Pract.* 2009;12:371-4.

Author's Contributions:

Ghansham : Analyzed, edited, reviewed the data.

Sagheer H Shah: Supervised and analyzed final data.

Zeeshan Hyder: Data collection.

Conflict of Interest:

The authors declare that they have no conflict of interest.

Source of Funding:

None

How to cite this article:

Ghansham, Shah SH, Hyder Z. Incision pain: A comparison between use of diathermy versus scalpel in patients undergoing elective abdominal surgery. *J Surg Pakistan* 2016;21(2):54-57.

Doi:<http://dx.doi.org/-10.21699/jsp.21.2.4>