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Study of Outcome of Diathermic Incision Cautery more than 5 cms in General and Urologic Surgery Operations

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Abstract

Introduction: Cutting diathermy is a more recent alternative to scalpel for surgical incisions. Its use was limited due to fear of increased risk of infection, impair healing and decrease cosmesis. However, recent studies suggest otherwise, claiming that diathermy may offer potential advantages with respect to blood loss, incision time and post-operative pain. The aim of this study was thus to evaluate the outcome of diathermic incision in terms of healing, post-op pain and scar characteristics in operations with incisions more than 5 cm in size.

Materials & Methods: A hospital based observational study included 182 cases scheduled to undergo surgery requiring more than approximately 5 cm of incision. Cases were operated by surgeons who have a minimum of 3 years of experience. Incision time, wound healing, post-op pain and scar characteristics were noted at discharge and follow up at 7th and 30th day.

Results: Mean incision time was 24.5 seconds with almost half of the cases (48.9%) had incision time between 20-30 seconds. A significant improvement was observed in all cases regarding mean Southampton wound score and pain score from day of discharge till day 30th of follow up. A significant improvement was also observed in patient and observer scar assessment scale in all the sub categories from day of discharge till day 30th of follow up None of the cases complaint of any surgical site infections or scar related complications.

Conclusion: Electrocautery can be considered as effective and safe in making large skin incision. It is associated with less incision time, faster healing, low post-operative pain and good scar characteristics.

Keywords: Diathermy; Scar Cosmesis; Surgical Incisions; Wound Healing.

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INTRODUCTION

Traditionally scalpels are used for making skin incisions that produce little damage to surrounding tissues.[1] However, there has been a continuous surge in identifying other methods of skin incision and in the recent years electro surgical instruments have achieved great attention in this regard.

Surgical diathermy is being increasingly used for tissue dissection, cutting and haemostasis.[2]

Electrodes used in making diathermy incision generate a pure sinusoidal current. The pure sinusoidal current allows tissue cleavage without damage to surrounding area and healing wound with minimal scarring.[3]

Due to the fear of production of large scars and improper tissue healing has restricted their usage in making skin incisions.[4,5] However, recent studies suggest otherwise, claiming that diathermy may offer potential advantages with respect to blood loss, incision time and post-operative pain[6] with minimal scar and no differences in wound burst strength.[7]

There have been limited studies on outcome of large (>5 cm) diathermy incisions in surgical procedures. The present study was thus planned to fill this lacuna in literature. We studied the outcome of diathermy incisions in terms of incision time, blood loss, post-op pain, wound infection and scarring.

MATERIALS AND METHODS

A hospital based observational study was conducted at Department of Surgery of a tertiary care SMBT IMS & RC, Dhamangaon, Nashik, Maharashtra, India from 31 Dec 2020 – 7 April 2022. Study was commenced after approval from institutional ethical committee and taking informed consent from participants. Study included 182 cases of both gender, 18 to 60 years of age, admitted to various surgical wards and scheduled to undergo surgery requiring more than approximately 5 cm of incision. Patients with bleeding diathesis, on anticoagulants, pregnant females and not fit for anesthesia were excluded.

Pre-operative antibiotic prophylaxis was given depending on site and choice of anesthetists and operating surgeon. Cases were operated by surgeons who have a minimum of 3 years of experience. Operations were performed in the supine/kidney position. Incision was made with the use of diathermy. Incision time calculated from the start of skin incision until deep fascia, aponeurosis or lump reached with complete hemostasis.

Post-op wound pain was calculated using the verbal rating score (VRS) ranging from 0 to 10. Wound healing was classified using the Southampton wound grading system;

- G0: Normal wound healing.
- G1: Normal healing with mild bruising or erythema.
- G2: Erythema plus other signs of inflammation.
- G3: Clear or serosanguinous discharge.
- G4: Purulent discharge.

Cosmetic assessment of scar was done as per "The Patient and Observer Scar Assessment Scale "[8] at discharge and at follow up on 7th and 30th post-operative days.

All the data was noted down in a pre-designed study proforma. Qualitative data was represented in the form of frequency and percentage. Quantitative data was represented using Mean ± SD. SPSS Version 21.0 was used for analysis.

RESULTS

Mean age of the study cases was 53.4 years with 87.4% males. Most common surgery in present study was inguinal/umbilical hernia (73.6%). Associated co-morbidities included diabetes and hypertension in 14.3% and 14.8% cases each (Table 1). Mean incision time was 24.5 seconds with almost half of the cases (48.9%) had incision time between 20-30 seconds. A significant improvement was observed in all cases regarding mean Southampton wound score and pain score from day of discharge till day 30th of follow up. All the cases showed normal wound healing and no pain was experienced by most of the patients by the end of day 30th. A significant improvement was also observed in patient and observer scar assessment scale in all the sub categories from day of discharge

Table 1: Distribution of patients as per baseline data

Baseline Variable (n-182)		N	%
Age (years)	<40	66	36.3%
	41-60	65	35.7%
	>60	51	28.0%
Gender	Female	23	12.6%
	Male	159	87.4%
Co-morbidities/ Risk factors	Hypertension	26	14.3%
	Diabetes	27	14.8%
	Alcoholism	32	17.6%
	Smoking	34	18.7%
Type of Surgery	inguinal/umbilical hernia	134	73.6%
	Nephrectomy/ pyeloplasty	25	13.7%
	Appendicitis	23	12.6%

Table 2: Distribution of Outcome variables at discharge and at follow up

Outcome Variable (n-182)		Mean/N	Median	SD/ %
Incision Time (sec)	< 20	41		22.5
	20-30	89		48.9
	> 30	52		28.6
Southampton Wound Score (Mean +/- SD)	Discharge	1.54	2.0	0.61
	Day 7	1.21	1.0	0.54
	Day 30	1.00	1.0	0.00
Pain Score (VAS 0-10)	Discharge	5.67	6.0	1.19
	Day 7	4.15	4.0	0.99
	Day 30	1.03	1.0	0.01
POSAS	Discharge	48.66	52.0	8.05
	Day 7	28.49	30.0	7.15
	Day 30	23.14	22.0	5.04

till day 30th of follow up (Table 2). None of the cases complaint of any surgical site infections or scar related complications.

DISCUSSION

Recent studies suggest that surgical diathermy shows good clinical outcome in the context of incision time, wound related post-operative pain, post-operative wound infections, and length of post-operative hospital stay and cosmetic outcome of scar in cases of elective surgical patients. To test this hypothesis, we conducted a hospital based observational study on 182 cases scheduled to undergo surgery requiring more than approximately 5 cm of incision. We observed that almost half of the cases (48.9%) had incision time between 20-30 seconds. A significant improvement was observed in all cases regarding mean Southampton wound score and pain score from day of discharge till day 30th of follow up. All the cases showed normal wound healing and no pain was experienced by most of the patients by the end of day 30th. A significant improvement was also observed in patient and observer scar assessment scale in all the sub categories from day of discharge till day 30th of follow up. None of the cases complaint of any surgical site infections or scar related complications.

Mahmud R *et al.*[9] in a similar study observed that compared with a scalpel incision, cutting diathermy resulted in significantly shorter incision times and reduced post operative wound related pain (P = 0.03) shorter duration of post-operative hospital stay (P = 0.003) with no differences in the wound complication rate and cosmetic outcome of scar. The study has demonstrated that surgical cutting diathermy is a safe and effective method to make skin incisions in elective surgery.

Ly J *et al.*[6] in a meta-analysis of 14 randomized trials observed that compared with a scalpel incision, cutting diathermy resulted in significantly less blood loss (mean difference 0.72 ml/cm(2); P < 0.001) and shorter incision times (mean difference 36 s; P < 0.001), with no differences in the wound complication rate (odds ratio 0.87; P = 0.29) or pain score at 24 h (mean difference 0.89; P = 0.05). Study concluded that skin incisions made by cutting diathermy are quicker and associated with less blood loss than those made by scalpel, and there are no differences in the rate of wound complications or post-operative pain.

Talpur AA *et al.*[10] aimed to examine the incisional time, blood loss during incision and post-operative wound complications and pain with both methods of skin incision. Study observed that diathermy incision is a safe and expedient technique. It takes less time than scalpel incision and loss of blood is also lower during incision. Diathermy is associated with lesser post-operative pain and complications than the scalpel incision. Diathermy should be method of choice in general elective surgery.

CONCLUSION

Electrocautery can be considered as effective and safe in making large skin incision. It is associated with less incision time, faster healing, low post-operative pain and good scar characteristics. No complication like surgical site infection or scar related issues were observed in any of the cases in present study.

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