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

[1]Vinugopinath and [2]H. Noorul Ayesha
[1,2]Department of General Surgery Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

Abstract
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. 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. 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. 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.

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Key Words
Diathermy, scar cosmesis, surgical incisions, wound healing

Corresponding Author
H. Noorul Ayesha,
Department of General Surgery Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

Author Designation
[1]Professor
[2]Junior Resident

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INTRODUCTION

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].

Aim and Objectives: The aim of this comparative study is to find out the role of prophylactic division of ilio inguinal nerve in reducing chronic post-operative pain following open hernia repair Lichenstein's mesh repair.By electively dividing the iliinguinal nerve during lichenstein's mesh plasty repair, the post-operative outcome of chronic groin pain which is inguinodynia is reduced as per various studies.

This comparative study is conducted to test the effectiveness of ilioinguinal neurectomy in post-operative pain perception. We have also evaluated the groin numbness which is a possible outcome of this neurectomy. And to find out whether neurectomy is useful in reducing post-operative pain along with negligible groin numbness.

MATERIALS AND METHODS

This study was conducted from February 2023 to September 2024 , 50 patients who were older than 18 years with primary unilateral uncomplicated inguinal hernia, who presented for operation in the department of General surgery, Sree mookambika college of medical sciences kulasekharam were considered eligible for the study. After a approval by local bioethics committees, informed consent was obtained of preoperatively on hospital admission. 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.

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.

Statistical analysis was done using the statistical package for social sciences (SPSS).Different statistical methods were used as appropriate. Mean ± SD was determined for quantitative data and frequency for categorical variables. The independent t- test was performed on all continuous variables. The normal distribution data was checked before any t-test. The Chi-Square test was used to analyze group difference for categorical variables A p- value < 0.05 was considered significant.

RESULTS AND DISCUSSIONS

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 .

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 .

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.

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/	Hypertension	26	14.3%
Risk factors	Diabetes	27	14.8%
Alcoholism	32	17.6%	
Smoking	34	18.7%	

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
	Discharge	1.54	2.0	0.61
Southampton Wound Score	Day 7	1.21	1.0	0.54
(Mean +/- SD)	Day 30	1.00	1.0	0.00
	Discharge	5.67	6.0	1.19
Pain Score (VAS 0-10)	Day 7	4.15	4.0	0.99
	Day 30	1.03	1.0	0.01
	Discharge	48.66	52.0	8.05
POSAS	Day 7	28.49	30.0	7.15
	Day 30	23.14	22.0	5.04

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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