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Comparison of Outcomes with Diathermy and Scalpel Skin Incision in Elective Inguinal Hernia Surgery

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Abstract

Background: Electrocautery for surgical incision is rarely used for fear of unhealthy healing and poor scar cosmesis. There is paucity of literature on the use of diathermy for incisions in elective surgeries in the randomised setting. The present study was designed to address this lacunae in literature. **Material and Methods:** This was a hospital-based prospective randomised control study conducted among 100 patients who underwent elective inguinal hernia surgery in a tertiary care center in Tamil Nadu, India from January 2019 to June 2020. The patients were randomised into two groups based on computer generated random numbers table. Post operative wound was evaluated on post operative day 2 and 5 using the Southamptom wound grade and scar cosmesis was assessed using the Manchester scar score at 6 months postoperatively. **Results:** On statistical analysis, for incision time, there was no significant difference between the two groups, whereas on evaluating the blood loss between the two groups there was statistically significant difference. There was no statistically significant difference between the two groups on day 2 and day 5 of the wound complication and 6 months postoperatively there was no significant difference between the two groups in terms of scar cosmesis. **Conclusion:** Diathermy incisions are comparable to a scalpel incision in terms of incision time but diathermy results in significantly less blood loss. Postoperative wound healing and scar characteristics were found to be similar for both groups with no statistically significant difference.

Keywords: Diathermy, Scalpel Skin Incision, Elective Surgery

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Introduction

Surgical incisions and their resultant scars are the most important cosmetic outcomes for the patient. Since the emergence of the surgical practice, incisions have been made with use of stainless-steel scalpel.

The electrosurgical unit has been one of the most practice changing inventions in the surgical specialty with it being the most common aid to achieve hemostasis. However, its use to make incisions has not gained mainstream acceptance for fear of excessive scarring. Although several studies have found comparable outcomes with the use of scalpels, they are limited by their sample size, the absence of a control group and their retrospective nature.

With the aim of bridging this lacuna in literature, we undertook a study to compare the outcomes of scars resulting from use of electrocautery and stainless-steel scalpels for incisions.

Methodology

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The study was conducted in a tertiary care hospital in the state of Tamil Nadu. Ethical committee approval was obtained and the sample size of 100 patients was calculated to be of statistical significance.

All patients undergoing elective inguinal hernia repair during January 2019 to June 2020 were included in the study population. Patients were randomized using computer generated random number table, with even numbers being allocated to the scalpel group and off numbers being allocated to the electrocautery group.

Patients undergoing recurrent hernia repair, pediatric herniotomy and immunocompromised status were excluded from the study group. After obtaining informed consent, all patients underwent open hernia repair with mesh using Lichtenstein's technique under spinal anesthesia. Intraoperative blood loss was assessed by weighing the used gauze pieces with 1gm increase in weight being correlated with 1 ml. Skin closure was done using silk 2/0 sutures. Patients were administered injectable ceftriaxone 1 gm at the induction of anesthesia and were continued on non- steroidal analgesics for 5 days post operatively. All patients were discharged on post operative day 2 and were followed up with daily wound check till suture removal on day 10. Wound healing was graded as per Southampton wound grade, with grade 3 and 4 being considered as wound complication. Scar cosmesis was assessed at 6 months postoperatively using Manchester scar score.

Statistical Methods

Data was analyzed using SPSS software. Results were presented in tables. Chi square test was used to assess statistical significance.

RESULTS

Table 1: Demographic Distribution

		Group		**Total**
		Scalpel	**Diathermy**	
AGE	<20	2	2	4
	21-30	5	2	7
	31-40	5	7	12
	41-50	12	12	24
	51-60	16	14	30
	>61	10	13	23
Total		50	50	100
Age Distribution				
		Group		Total
		SCALPEL	DIATHERMY	
SEX	Male	50	48	98
	Female	1	1	2
Total		50	50	100
Sex Distribution				

The age group and sex distribution among the study groups were comparable with no statistically significant intergroup variation.

In the scalpel group, mean blood loss was 4.05ml (SD 0.67ml), whereas in the diathermy group, mean blood loss was 0.60ml (SD 0.43ml). On analysis, the p value was <0.0001. There was statistically significant difference between the two groups.

Table 2: Describes the Wound Complication on Day 5

		WOUND COMPLICATIONS DAY 2		**Total**	**P value**
		No	**Yes**		
Group	SCALPEL	46	4	50	0.736
	DIATHERMY	47	3	50	

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Total		93	7	100	
Describes the Wound Complication on Day 2					
		WOUND COMPLICATIONS DAY 5		Total	P value
		No	Yes		
Group	SCALPEL	45	5	50	0.372
	DIATHERMY	42	8	50	
Total		87	13	100	

On post operative day 2, 4 patients developed wound complications in scalpel group and 3 patients developed wound complications in diathermy group, and the difference was not statistically significant (p value 0.736). On postoperative day 5, 5 patients developed wound complications in scalpel group and 8 patients developed wound complications in diathermy group, with no statistically significant difference in the findings (p value 0.372).

Table 3: The scar assessment in the wound at 6 months post operatively

Group		**N**	**Mean**	**Std. Deviation**	**P value**
Scalpel	50	6.98	0.62	0.615	
Diathermy	50	6.92	0.57		
The scar assessment in the wound at 2 months post operatively					
Group		N	Mean	Std. Deviation	P value
Scar Assessment	Scalpel	50	7.02	0.62	0.403
	Diathermy	50	6.92	0.56	

Six months postoperatively the mean scar assessment score in scalpel group was 6.98 (SD 0.62), whereas the mean scar assessment score in diathermy group was 6.92 (SD 0.57). The difference was found to be statistically insignificant (p value 0.615).

DISCUSSION

Surgical wound healing and scars are one of the important cosmetic outcomes for patients. There has been a hesitation with the adoption of diathermy for surgical incisions due the fear of compromised wound healing and unhealthy scars. The present study observed no statistically significant difference in the outcomes. These findings are similar to those of Farshad Zarei et al, Muhammad Shamim et al and Aird LN, et al.[1-3]

Blood loss and operative time have an important bearing on the surgical outcome. In the present study the difference in blood loss using both techniques were statistically significant. These findings were also observed by AA Talpur et al,[4] however, were in contradiction to the study by Emmanuel Chrysoes et al,[5] who found no difference in blood loss.

Although the present study was performed in clean cases, Okereke CE et al,[6] found similar results in the study conducted on open appendectomy patients where surgical outcome, post-operative pain, wound infection and surgical scar cosmesis were similar in both groups.

Ayandipo OO et al,[7] in their prospective randomized double blind study conducted in found the use of electrocautery is associated with reduced incision time, incisional blood loss, and postoperative pain. This is in contrast to our results where we have observed no difference in incision time but a significant difference in blood loss.

The use of electrocautery has also helped reduce blood loss and achieve hemostasis in patients with bleeding disorders as noted by Milcho J Panovski et al and M Ihsan Karaman et al.[8,9]

CONCLUSION

Based on the observations made from this study, it is concluded that the diathermy incision is similar to the scalpel incision in terms of incision time but diathermy incision has significantly less blood loss than the scalpel incision. Postoperatively, on assessment of wound infection and scar characteristics, it was found that the diathermy was no different from a scalpel incision.

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From these findings we can safely say that diathermy can be used in place of scalpel in making a skin incision.

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