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Original Research

Comparison of the outcome of diathermy incisions v/s surgical scalpel incisions in general surgery

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ABSTRACT:
Background: Diathermy is the use of non-ionizing electromagnetic energy from the radio as therapeutic agent. The present study was conducted to compare the outcome of diathermy incisions v/s surgical scalpel incisions in general surgery. **Materials & Methods:** 258 patients reported for various conditions were randomly assigned to group I (129) in which incision with cutting diathermy was performed and group II (129), in which cold steel scalpel was used. Variables such as hospital stay, infection rate and non-infective complications like swelling, bleeding, dehiscence and seroma formation were recorded. **Results:** Out of 258 patients, males were 148 and females were 110. Inguinal hernia was seen in 15, umblical/Paraumblical hernia in10, breast fibroadenoma in 6, lipoma in14, hernia in 30, cholelithiasis in 44, pilonidal sinus in 35, hydrocele in 25, goiter in 12, undescendent testis in 15, pilonidal sinus in 32 and varicocele in 20 cases. The length of incision 9.5 cm in group I and 5.4 cm in group II, closure technique was sub-cuticular in 101 and 69, interrupted in 20 and 35 and mattres in 8 and 25 in group I and II respectively. Hospital stay was 8.4 days in group I and 10.2 days in group II. Complications found to be seroma formation in 12 and 16, wound dehiscence in 3 and 8 and bleeding/haematoma in 1 and 7 in group I and in group II respectively. The difference was significant (P< 0.05). **Conclusion:** Authors found that both techniques were equally effective in the management of cases.
Key words: diathermy, Paraumblical hernia, breast fibroadenoma

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INTRODUCTION

People have been using cautery for medical treatment from many centuries. In early times cautery appliances and methods were crude when wounds would be sealed with branding iron heated in fire to stop bleeding and as a mean of destroying tumors.[1] Use of elecrtrocautery or diathermy for skin incision is as old as invention of these devices. Cutting via diathermy is achieved by the use of a very high frequency usually upwards of 100 kHz continuous (unmodulated) current of sufficient voltage (200-500 V). Use of high frequency is to ensure that the patient's nerves and muscles are not stimulated.[2] Lower frequencies could cause twitching and cramps, with consequent intraoperative problems. Diathermy is the use of non-ionizing electromagnetic energy from the radio as therapeutic agent. It is of Long wave having longest wavelength 300, most penetrating, no longer utilized due to high potential of causing burns and interference with radio transmissions, Shortwave and Microwave.[3]

Diathermy permits the incision to be made quickly, reduces bleeding and causes less postoperative pain; but produces a burn of variable depth in the tissue, which may affect outcome of surgical wound.[4] One additional advantage of cauterization is that it causes

cleansing of gets wound sites by killing off many migrating bacteria, causing reduced postoperative wound infection rate.[5] The present study was conducted to compare the outcome of diathermy incisions v/s surgical scalpel incisions in general surgery.

MATERIALS & METHODS

The present study comprised of 258 patients reported for various conditions in the department of general surgery of both genders. All patients were informed regarding the study and their written consent was obtained.

Demographic profile comprised of name, age, gender etc. was recorded. Patients were randomly assigned to group I (129) in which incision with cutting diathermy was performed and group II (129), in which cold steel scalpel was used. Variables such as hospital stay, infection rate and non-infective complications like swelling, bleeding, dehiscence and seroma formation were recorded in both groups to compare the final surgical outcome compared. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 258		
Gender	**Males**	**Females**
Number	148	110

Table I shows that out of 258 patients, males were 148 and females were 110.

Table II Various cases reported

Diagnosis	Number	P value
Inguinal hernia	15	0.01
Umblical/Paraumblical hernia	10	
Breast fibroadenoma	6	
Lipoma	14	
Hernia	30	
Cholelithiasis	44	
Pilonidal sinus	35	
Hydrocele	25	
Goiter	12	
Undescendent Testis	15	
Pilonidal sinus	32	
Varicocele	20	

Table II, graph I shows that inguinal hernia was seen in 15, umblical/Paraumblical hernia in10, breast fibro-adenoma in 6, lipoma in14, hernia in 30, cholelithiasis in 44, pilonidal sinus in 35, hydrocele in 25, goiter in 12, undescendent testis in 15, pilonidal sinus in 32 and varicocele in 20 cases. The difference was significant (P< 0.05).

Graph I Various cases reported

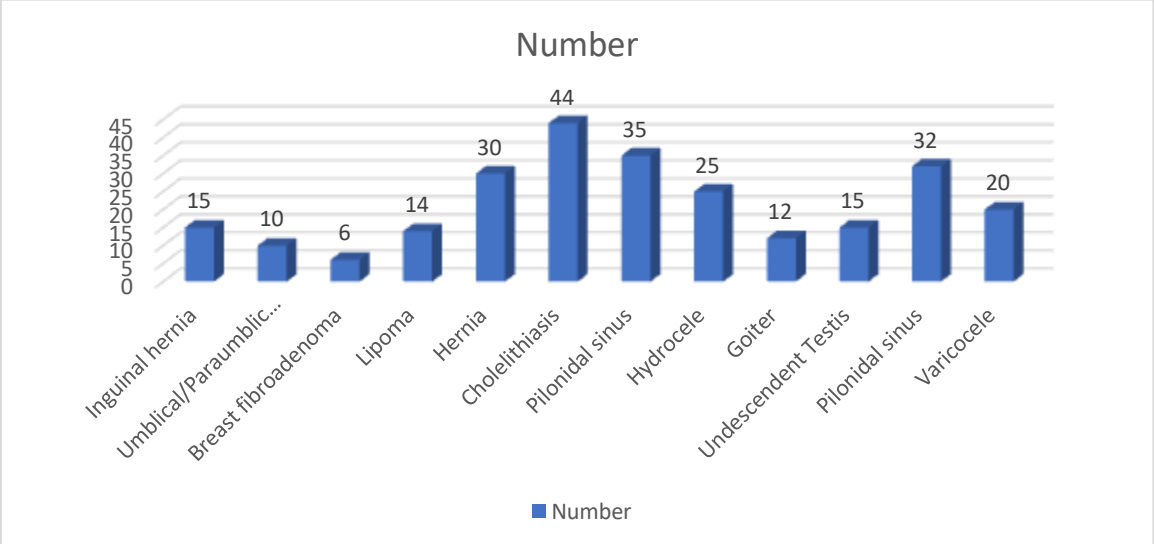

Table III Assessment of parameters in both groups

Parameters	Group I (129)	Group II (129)	P value
Length of incision	9.5	5.4	0.51
Closure technique			
Sub-cuticular	101	69	0.001
Interrupted	20	35	
Mattres	8	25	
Hospital stay (Days)	8.4	10.2	0.12
Complications			
Seroma formation	12	16	0.02
Wound dehiscence	3	8	
Bleeding/haematoma	1	7	

Table III shows that length of incision 9.5 cm in group I and 5.4 cm in group II, closure technique was sub-cuticular in 101 and 69, interrupted in 20 and 35 and mattres in 8 and 25 in group I and II respectively. Hospital stay was 8.4 days in group I and 10.2 days in group II. Complications found to be seroma formation in 12 and 16, wound dehiscence in 3 and 8 and bleeding/haematoma in 1 and 7 in group I and in group II respectively. The difference was significant (P< 0.05).

DISCUSSION

With the passage of time this technique has been modified and now because of advances in technology, fire heated cautery has been replaced by Electrocautery.[6] Despite advancement in technology the safety factor and outcomes of resultant wound by using electrocautery remain under question.[7] Although there are studies on effects of electrocautery and diathermy in foreign literature, clinical trials at local level are very few.[8] Depending on the voltage used, the electrocautery can have varying effects on the patient's body. When used for skin or tissue cutting to access surgical site; it causes vaporization of soft tissue by producing temperatures up to 1000^{o}C at the tip of electrode, resulting in tissue cleavage.[9] It also causes denaturation of proteins an important factor in coagulation of blood, used to seal off bleeding blood vessels during surgery to keep the site clean and reduce blood loss. Electrocautery is also used in ablation or removal of lesions such as warts, suspected skin cancers.[10] The present study was conducted to compare the outcome of diathermy incisions v/s surgical scalpel incisions in general surgery.

In present study, out of 258 patients, males were 148 and females were 110. We found that inguinal hernia was seen in 15, umblical/Paraumblical hernia in10, breast fibroadenoma in 6, lipoma in14, hernia in 30, cholelithiasis in 44, pilonidal sinus in 35, hydrocele in 25, goiter in 12, undescendent testis in 15, pilonidal sinus in 32 and varicocele in 20 cases. Jamali et al[11] 100 consecutive patients for elective general surgery were randomly assigned to either group A incision with cutting diathermy (n=50) or group B cold steel scalpel (n=50). Data including demographic details, hospital stay, infection rate and non-infective complications like swelling, bleeding, dehiscence and seroma formation were recorded in both groups to compare the final surgical outcome compared. A total of 80 patients were included in the study, placed alternatively into two groups of 40 patients each with majority being male (n = 61, 76.3%). The mean age was 22.46 years. The positive predictive value for patients of Group A was 92.5% while for Group B was 77.5%. When diagnostic accuracy was compared on the basis of Gender for the two groups, the positive predictive value for male patients of Group A and B was 90.09% and 89.28% respectively, but for females the positive predictive value of Group A and B was 100% and 50% respectively. In Diathermy (Group A) total 20% patients developed complications and these were seroma formation (n=4, 8%), wound dehiscence (n=3, 6%) and wound infection (n=3, 6%). In Scalpel (Group B) total 26% patients developed complications (P-value=0.370) in which seromas was noted (n=5, 10%) then wound infection (n=4, 8%), then wound bleeding (n=3, 6%) and lastly seroma formation (n=1, 2%). Hospital stays were also almost similar with mean value 8.24 days in diathermy group and 10.54 days in scalpel group. No remarkable difference in demographics, characteristics and in other variables of patients was noted.

We found that length of incision 9.5 cm in group I and 5.4 cm in group II, closure technique was sub-cuticular in 101 and 69, interrupted in 20 and 35 and mattres in 8 and 25 in group I and II respectively. Hospital stay was 8.4 days in group I and 10.2 days in group II. Complications found to be seroma formation in 12 and 16, wound dehiscence in 3 and 8 and bleeding/haematoma in 1 and 7 in group I and in group II respectively.

CONCLUSION

Authors found that both techniques were equally effective in the management of cases.

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