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A RANDOMISED COMPARATIVE STUDY OF DIATHERMY INCISIONS AND SCALPEL INCISIONS IN OPEN INGUINAL HERNIOPLASTY

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ABSTRACT
INTRODUCTION
The surgical scar remains the only visible evidence of the surgeon's skill and all of his efforts are judged on its final appearance. Incision is the only part of the operation patient sees, so incision should be made bearing in mind the ultimate cosmetic result. This study was undertaken to see the superiority and advantages produced by diathermy incisions when compared to scalpel incisions.
OBJECTIVE
Comparison of Diathermy incision and Scalpel incision in elective open inguinal hernioplasty.
OBJECTIVES
To access the advantages of Diathermy incision with regard to1) Incision time 2)Early postoperative pain relief 3) Post-operative wound complications.
METHODS
A controlled prospective clinical comparative study. 50 cases were studied. Group A-25 cases incision was given by scalpel and GroupB-25 incisions was given by diathermy**.** Comparsion of post operative wound gaping, hypertrophied scar, keloid, duration of incisions in patients studied, pain scale from patients in POD1 and POD2 for scalpel and diathermy incision according to visual analog scale were studied.
RESULTS
According to the data collected and observed,12 percent of the patients who had underwent scalpel incisions had developed post operative wound gaping which was very significant, only 4 percent in patients underwent diathermy incisions had wound gaping. Hypertrophic scar was seen in 12 percent of patients who underwent scalpel incisionbut when compared with diathermy it is 0 percent. Keloid had developed in 2 patients who underwent scalpel incisions alone, so diathermy incisions has a better outcome and cosmetic results when compared to scalpel incisions.Diathermy incisions proves superior in view of reduced incision time, early post operative pain relief and lesser complications
CONCLUSION
This study proves the superiority of diathermy incisions which has early post operative pain relief, lesser incision time, minimal scar and better cosmetic result.

I. INTRODUCTION

The high-frequency electric surgical knife is one of the commoninstruments in surgical operations since its inception in 1929.Whileelectrosurgical instruments are used increasingly for tissue dissection,cutting, and hemostasis, concerns about excessive scarring and poor woundhealing have curtailed the widespread use of diathermy for skin incision. Fearof deep burns with diathermy and resultant scarring continue compared with thescalpel, whichproduces a clean, incised wound with minimal tissue destruction.The use of an electrode delivering a pure sinusoidal current, however, allowstissue cleavage without damage to surrounding area, thus explains the absence oftissue scarring and subsequent healing with minimal scarring

AIM
Comparison of Diathermy incision and Scalpel incision in elective open inguinal hernioplasties
OBJECTIVE
To access the advantages of Diathermy incision with regard to,

- Incision time,
- Early postoperative pain relief,
- Post operative wound complications

II. MATERIALS AND METHODS

Patients presenting to Chettinad hospital and research institute, kelambakkam who are posted for elective open inguinal hernioplasty surgery.After obtaining informed and written consent in

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understandable language from patients are subjected

STUDY DESIGN:An open labelled prospective comparative clinical study

NUMBER OF GROUPS Two

SAMPLE SIZE:25 patients per group irrespective of sex.

Study Group was subdivided into :

STUDY GROUP A : Patients will be subjected to Diathermy incision.

STUDY GROUP B : Patients will be subjected to Scalpel incision.

TIMELINE OF STUDY:MARCH 2021-MARCH 2022

INCLUSION CRITERIA

- All patients undergoing surgery for elective inguinal hernioplasties in the Department of General Surgery in chettinad hospital and research institute, kelambakkam
- Incision made on non-tension area.
- Age 10 - 70 yrs.
- HbA1C - <7.

EXCLUSION CRITERIA

- Pregnant women,
- Emergency cases,
- Immunocompromised patients,
- Patients with pacemaker device,
- Unclear and untidy wounds,

III. METHODOLOGY

A controlled prospective clinical comparative study.

40 cases were studied.

Group A-20 cases incision was given by scalpel

GroupB-20 incisions was given by diathermy**.**

Comparison of post operative wound gaping, hypertrophied scar, keloid, duration of incisions in patients studied, pain scale from patients in POD1 and POD2 for scalpel and diathermy incision according to visual analog scale were studied.

Patients were followed till 21st post-operative day in the hospital following surgery and once in 2 months for 6 months.

IV. RESULTS

AGE DISTRIBUTION OF PATIENTS STUDIED

In this study, the age distribution of the patients and their majority were compared between the two study groups. The majority of the population included in both the study groups were middle aged between 40-60 years.

The p value for the age distribution is 0.484 which is done using pearson chi square test is not very significant

GENDER DISTRIBUTION

In this study, the gender distribution of the patients and their majority were compared between the two study groups. The majority included in both the study groups were male gender.

The p value for the age distribution is 0.225 which is done using pearson chi square test is not very significant.

TREATMENT DISTRIBUTION OF PATIENTS STUDIED

TYPE OF INCISION	FREQUENCY	PERCENT
SCALPEL	25	50.0
DIATHERMY	25	50.0
Total	50	100.0

POST OPERATIVE HYPERTROPHIC SCAR IN PATIENTS STUDIED:

Hypertrophic scar is seen in scalpel incision with significant P value of 0.074 using Pearson-Chi square test.

POST OPERATIVE KELOID IN PATIENTS STUDIED:

Keloid is considerably seen in scalpel incision with a highly significant P value of 0.0149 using Pearson-Chi square test.

DURATION OF INCISIONS IN PATIENTS STUDIED

The duration of incisions were compared, the mean value is 7.24 and 6.29 in scalpel and diathermy respectively, with a high significant P value of <0.0001.

Diathermy is found to be superior with mean value 6.9 and standard deviation is 0.24. Hence diathermy is easier and less time consuming than scalpel incision with p value of 0.0001which is statistically highly significant

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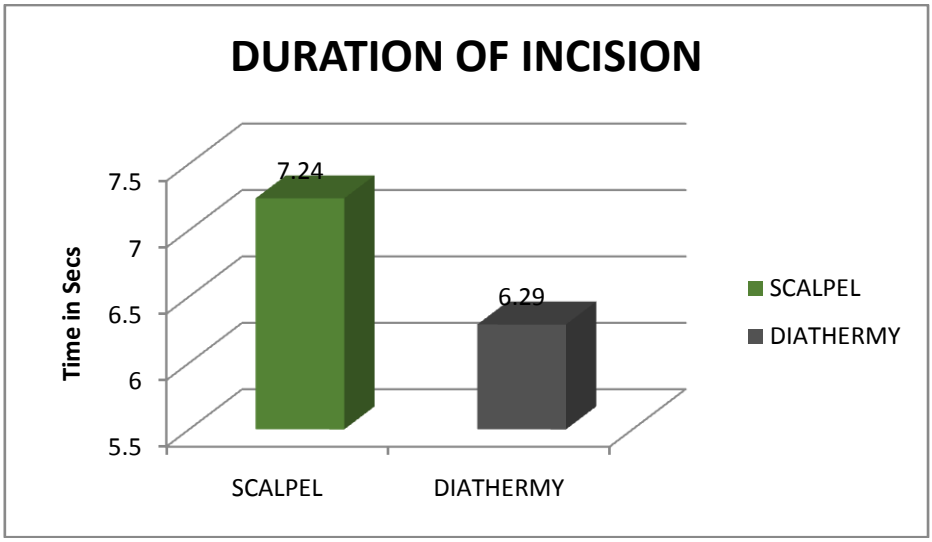
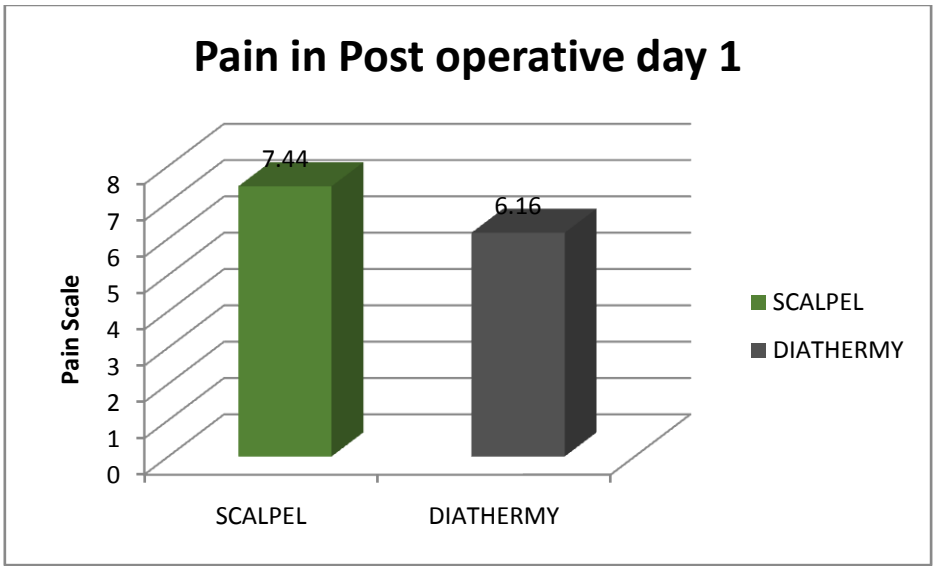
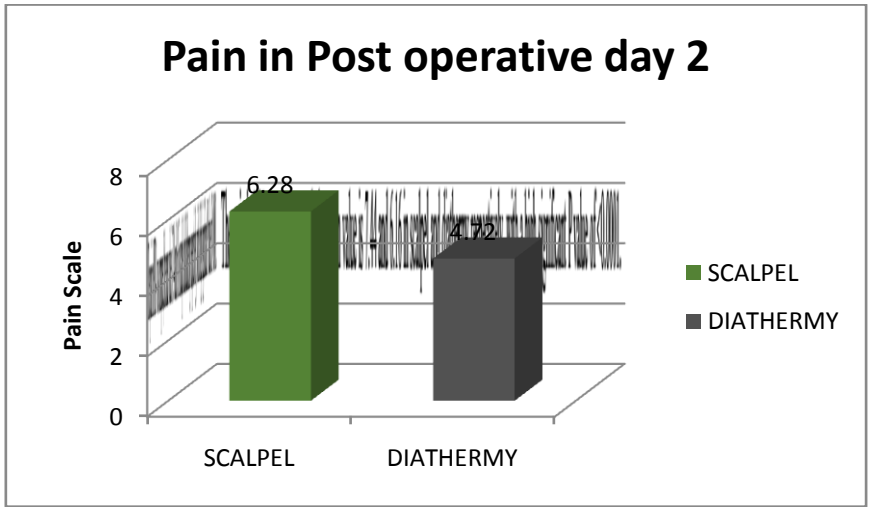


COMPARATIVE STUDY IN PAIN SCALE FROM PATIENTS IN POD1 AND POD2



The pain in POD-1 was compared, the mean value is 7.44 and 6.16 in scalpel and diathermy respectively, with a high significant P value of <0.0001.



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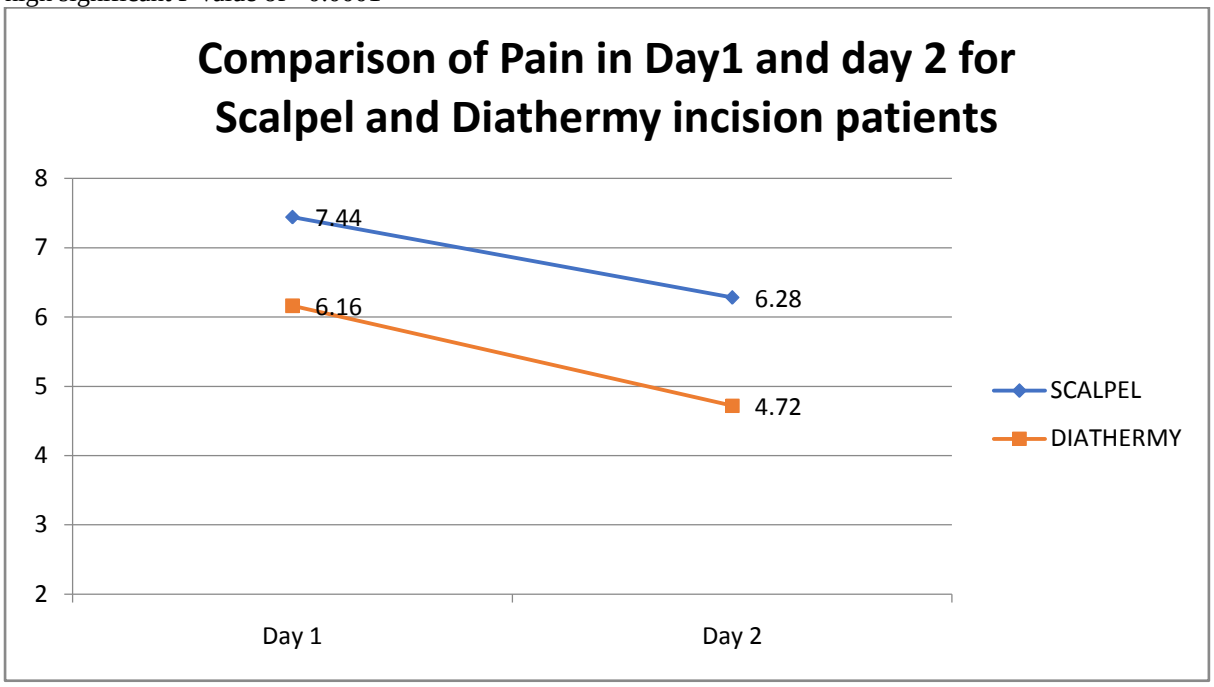
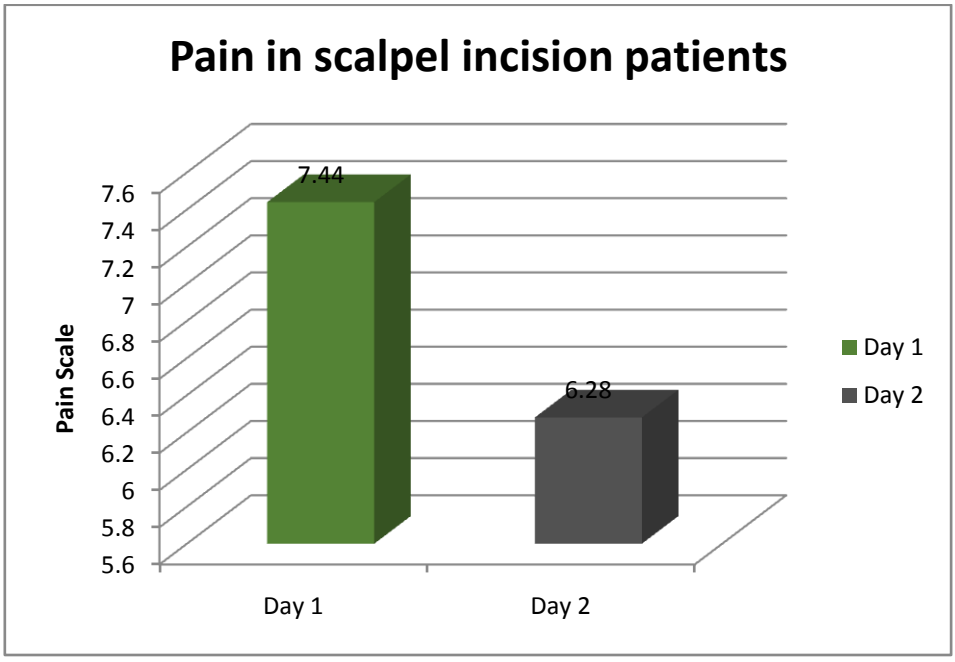
The pain in POD-2 was compared, the mean value is 6.28 and 4.72 in scalpel and diathermy respectively, with a high significant P value of <0.0001



Pain scale according to visual analog scale was studied comparing the treatment groups in post operative day 1 and 2 respectively and results are mentioned above. In post operative day 1, the standard deviation of scalpel and diathermy is 0.51 and 0.80 respectively whereas in post operative day 2, the standard deviation of scalpel and diathermy is 0.54 and 0.79.

The p value is 0.0001 and is highly significant which also shows the early post operative pain relief is observed in diathermy incision than in scalpel incision

COMPARISON OF PAIN BETWEEN DAY 1 AND DAY 2 FOR SCALPEL INCISION:



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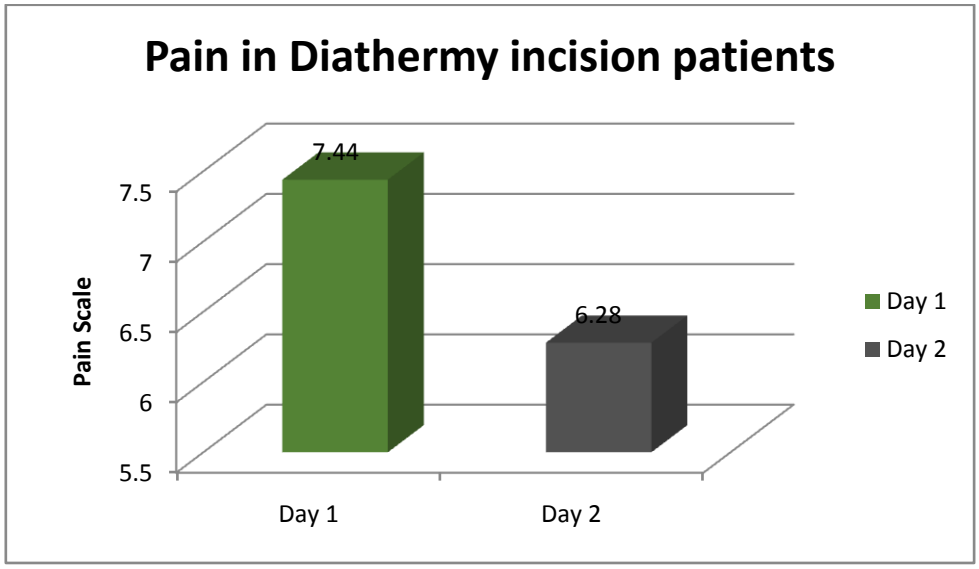
The pain in scalpel incision was compared and the mean value in POD1 and POD2 is 7.4400 and 6.2800, with a p value of 0.0501, which is highly significant.

COMPARISON OF PAIN BETWEEN DAY1 AND DAY2 FOR DIATHERMY INCISION



The pain in diathermy incision was compared and the mean value in POD1 and POD2 is 6.1600 and 4.7200, with a p value of 0.0461, which is highly significant.Three complications were taken into account and compared with the patients who underwent scalpel and diathermy incisions and had wound gaping at seventh post operative day, hypertrophic scar was observed only in scalpel incision, keloid was also noted only in scalpel incision. All data were included and calculated in the two tables and results are discussed.

In seventh post operative day, wound gaping was observed in three patients which accounts to 12 percent who underwent scalpel incisions whereas in diathermy incisions only one patient had wound gaping which accounts only 4 percent as shown in table 13 and p value is observed to be 0.297, which is highly significant.

Hypertrophic scars were observed in some of the patients and their results were tabulated. 12 percent of the patients who underwent scalpel incision developed hypertrophic scars. No single case developed hypertrophic scar who underwent diathermy incision so the study proves that diathermy incision is superior to scalpel in preventing post operative complications as shown in table 14. p value 0.074 which is statistically significant.

Keloid was observed in 8 percentage of patients who underwent scalpel incision and none of them developed keloid in diathermy incision as shown in table 15. P value 0.149 which is statistically not very significant.

V. DISCUSSION

Traditionally scalpel was used for various skin incisions, but with the invention of surgical diathermy in the beginning of 20th century it has increasingly been used for the tissue dissection and hemostasis.Many surgeons are reluctant in making incision for the skin and fascia using diathermy. There is perceived fear of devitalization of tissues within the wound which may delay wound healing leading to more scaring. This has been challenged by the current and recent research work which suggested diathermy to be safe option with no added risk.

The high-frequency electric surgical knife is one of the commoninstruments in surgical operations since its inception in 1929.Whileelectrosurgical instruments are used increasingly for tissue dissection,cutting, and hemostasis, concerns about excessive scarring and poor woundhealing have curtailed the widespread use of diathermy for skin incision. Fearof deep burns with diathermy and resultant scarring continue compared with thescalpel, whichproduces a clean, incised wound with minimal tissue destruction.The use of an electrode delivering a pure sinusoidal current, however, allowstissue cleavage without damage to surrounding area, thus explains the absence oftissue scarring and subsequent healing with minimal scarring

Ahmad et al., (2011) revealed findings in diathermy vs scalpel incisions in abdominal surgeries and stated that post operative infections are comparatively low in diathermy than in scalpel groups.

Ali et al., in (2009) concluded that diathermy can safely be used to make skin incision and noted that SSI is 12.5% cases in the diathermy group whereas in the scalpel group it was 17.5% but this difference was not found to be statistically Furthermore, the recent increase in blood borne diseases such as hepatitis C and human deficiency virus infection makes exclusion of the scalpel from the operating field an attractive option.

Dixon et al.,(2010) has shown that diathermy incision is more rapid than scalpel incision.

Byrne FJ et al (2007)., have demonstrated a clear advantage in the use of diathermy to create a hip incision showing a significant reduction in wound-related blood loss and a reduction, whilst not statistically significant, in total operative blood loss in his study titled " Diathermy versus scalpel incisions for hemiarthroplasty for hip fracture: a randomized prospective trial " [4].

Muhammad Shamim et al(2009)., has concluded in his study titled " General Surgery: Double-Blind, Randomized, Clinical Trial " that diathermy incision has significant advantages compared with the scalpel because of reduced incision time, less blood loss, & reduced early postoperative pain [5].

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