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A Prospective Study to Compare Continuous Versus Interrupted X Suture in Prevention of Burst Abdomen

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Abstract
Background And Objectives*: The present study was undertaken to assess the proportion of burst abdomen in post midline laparotomy patient using interrupted X sutures versus continuous suture technique in sheath closure.*
Materials And Methods: *A total of 100 patients undergoing midline laparotomy electively and in emergency settings ,from the department of general surgery whose satisfying inclusion and exclusion criteria ,after taking written and informed consent were divided in to two groups of 50 each.In group A ,closure was performed using No.1 prolene suture, using interrupted X type, and in group B closure was done by continuous method, and these patients were followed up in the post operative period.*
Results *Patients were followed up in the early post operative period and regular follow up.6 of the patients developed wound dehiscence, in contrast with control group in which 18 patients developed burst abdomen.2 of our patients from the study group developed incision hernia,13 from control group developed incision hernia. In the present study 44 patients in whom interrupted X suturing was done had a normal wound healing compared to 32 patients with continuous group. 10 patients from the interrupted group had a prolonged hospital stay compared to 22 patients from the continuous group. Therefore, Interrupted X suturing technique overweighs the disadvantages of the continuous suturing technique. Hence the technique should be considered.*
Conclusion: *Hence Interrupted X suture is better than continuous sheath closure in prevention of burst abdomen.*
Key words: *Laparatomy, Rectus sheath, Interrupted X, Continuous, Burst abdomen*

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I. Introduction

Acute wound failure,otherwise known as wound dehiscense or burst abdomen refers to postoperative separation of abdominal musculoaponeuroticlayers.wound dehiscence is among the most dreaded complication faced by the surgeon and is of great concern because of the risk of evisceration;the need for some form of intervention and possibility of repeat dehiscence ,surgical wound infection and incisional hernia formation.

Acute wound failure occurs in approximately 1% to 3% of patientswho undergo an abdominal operation. Dehiscence most often develops 7 to 10 days postoperatively but may occuranytime after surgery, from 1 to more than 20 days. A multitudeof factors may contribute to wound dehiscence .Acute wound failure is often related to technical errors in placing sutures tooclose to the edge, too far apart, or under too much tension.

Local wound complications such as hematoma and infection can also predispose to localized dehiscence. In fact, a deep wound infection is one of the most common causes oflocalized wound separation. Increased intra-abdominal pressure(IAP) is often blamed for wound disruption and factors thatadversely affect wound healing are cited as contributing to thecomplication. In healthy patients, the rate of wound failure issimilar whether closure is accomplished with a continuous orinterrupted technique. In high-risk patients, however, continuousclosure is worrisome because suture breakage in one placeweakens the entire closure.

Prevention of acute wound failure is largely a function of carefulattention to technical detail during fascial closure, suchas proper spacing of the suture, adequate depth of bite of thefascia, relaxation of the patient during closure, and achieving atension-free closure. For very high-risk patients, interruptedclosure is often the wisest choice. Alternative methods of closuremust be selected when primary closure is not possible withoutundue tension. Although retention sutures were used extensivelyin the past, their use is less common today, with many surgeons opting to use a synthetic mesh or bioabsorbable tissue scaffold.

II. Background And Objectives

The present study was undertaken to assess the proportion of burst abdomen in post midline laparotomy patient using interrupted X sutures versus continous suture technique in sheath closure.

METHOD OF COLLECTION OF DATA

A total of 100 patients undergoing midline laparotomy after taking written and informed consent and were divided equally in to 50 cases each in the study group(interrupted X)and control group (continous suture) and were followed up in the post operative period.

SOURCE OF DATA:

All patients satisfying inclusion criteria admitted in General surgery Department,GRH for a period of 6 months

III. Methodology

Materials and methods:

All patients undergoing emergency and elective laparatomies at GRH,attachedto Madurai medical college. This is the prospective study.A written an informed consent to be obtained from the patientsto be included in the study and data complaints,Generalexaminations,Abdominalexamination,Biochemical evaluation of blood sugar,bloodurea,electrolytes and other specificinvestigations.post op course carefully observed and criteria managed to analysemorbidity,hospital stay.

►Continous closure were performed using No.1 prolene,care being taken place each bite 1.5 to 2 cm from the linea alba edge with successive bites being placed 1 cm from each other.The edges of linea alba was gentlyapproximated without strangulation with an attempt to keep a suture to wound length ratio 4Interrupted closure was performed using No.1 prolenesuture.A large bite was taken outside in 2cm from the cut edge of the lineaalba.The needle emerged on the other side from inside out diagonally 2 cm from the edge and 4cm above and below the first bite.The strand was subsequently crossed or looped around the free end of sutureand continued outside-in ,diagonally at 90 ‘ to the first diagonal.The two end tied just tight enough to approximate the edges of linea alba taking care not to include bowel or omentum between the edges.This created X like crosses one on the surface and another deep to lineaalba.The next X suture was placed 1 cm away from the previous one.Henceforth in a 14 cm long ,3 X sutures were applied .

ELIGIBILITY CRITERIA:

A.INCLUSION CRITERIA:

All patient scheduled to undergo midline laparatomy for emergency and elective reasons were included in the study

B.EXCLUSION CRITERIA:

1 .patients younger than 16 years

2.patients who had undergone previous laparatomy for any conditions

3.patients who required a re exploratiobn in post op course were ex

ANALYSIS

Data analysis was done with the help of computer using SPSS 18 software .Using this software range, frequencies, percentages, means, standard deviations, chi square and 'p' values were calculated by One way ANOVA and Chi-square test was used to test the significance of difference between quantitative variables.

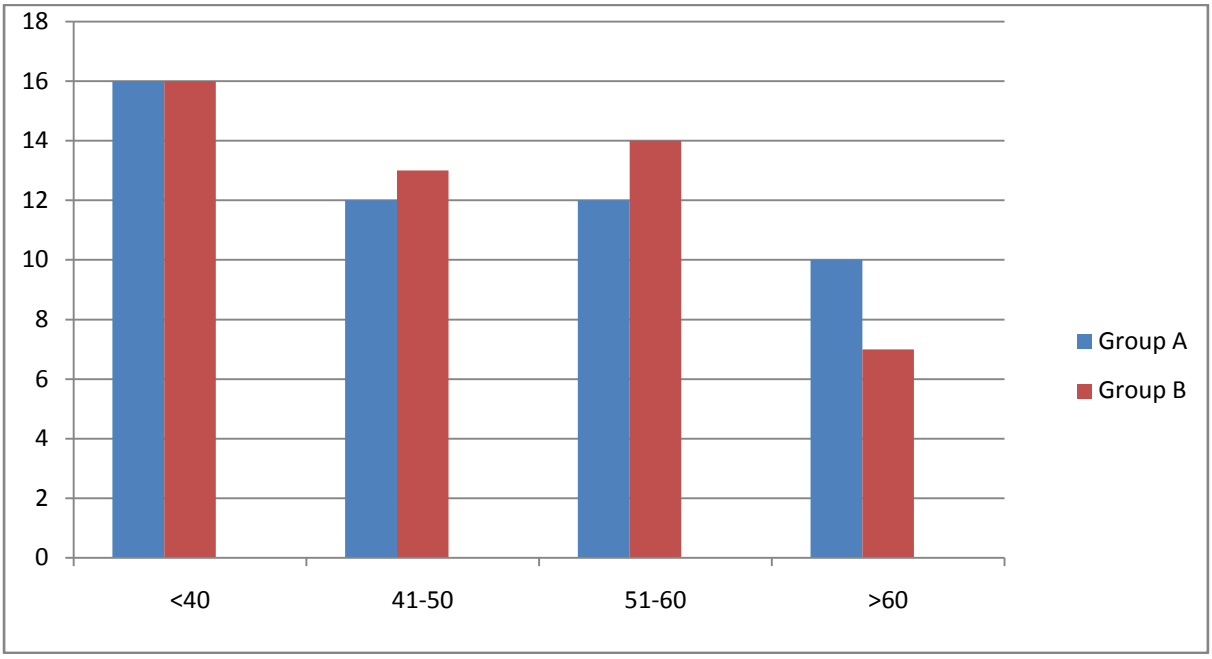
IV. Results And Observation

In the prospective study on efficacy of Interrupted X suturing technique,in rectus sheath closurefor all midline laparatomy in prevention of burst abdomen,conducted in the Department of General surgery at GovtRajaji Hospital Madurai,for the period of 6 months ,a total of 100 patients who underwent midline laparatomy for various indications were included in the prospective study and randomized in to two groups,of 50 patients in group A(interrupted X suture) and 50 patients in Group B (continous suture) were considered for the study.

PATIENT DEMOGRAPHY

AGE AT PRESENTATION

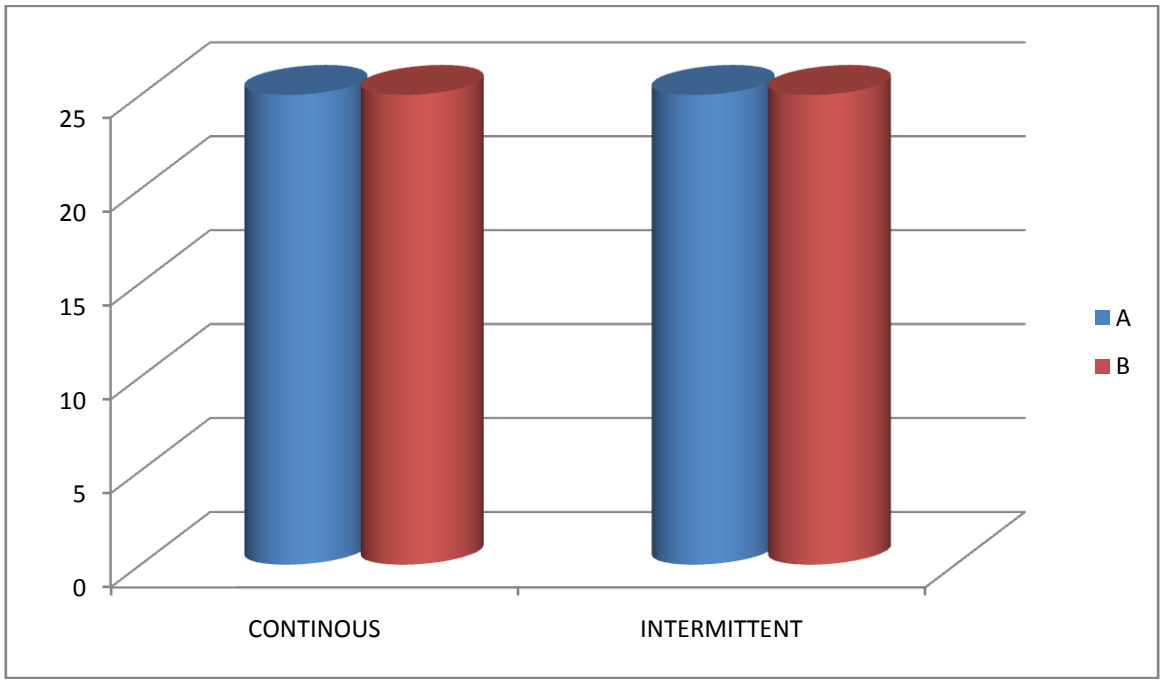
AGE GROUP IN YEARS	NUMBER OF PATIENTS	PERCENTAGE	GROUP A N=50	GROUP B N=50
<40	32	32%	16(32%)	16(32%)
41-50	25	25%	12(24%)	13(26%)
51-60	26	26%	12(24%)	14(28%)
>60	17	17%	10(20%)	7(14%)



In this study age of the study is more than 26 years,youngest person included in the study series was 26 and eldest was 83 years old.Almost 32 % were in <40 years.This includes 50% in group A and 50 % in group B.Average age ih the study series is 47.

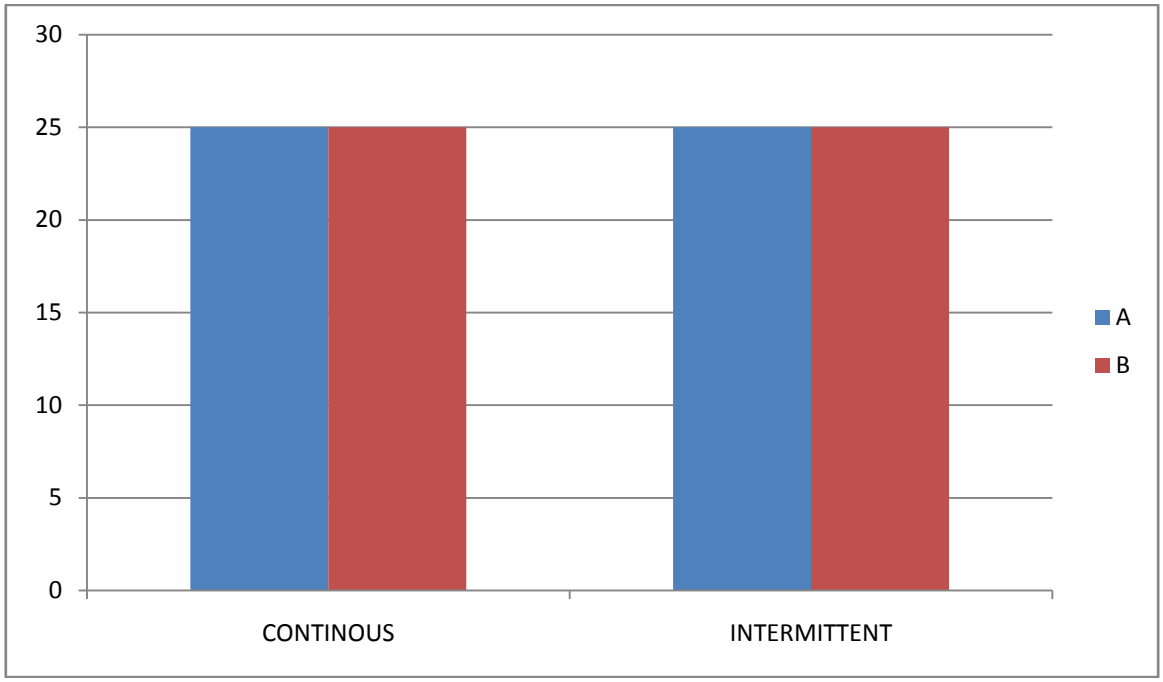
RECTUS SHEATH CLOSURE TECHNIQUE IN EMERGENCY SETTING

TECHNIQUE	**A**	**B**	**PERCENTAGE**
CONTINOUS	**25**	**25**	**50%**
INTERMITTENT	**25**	**25**	**50%**



RECTUS SHEATH CLOSURE IN ELECTIVE SETTINGS

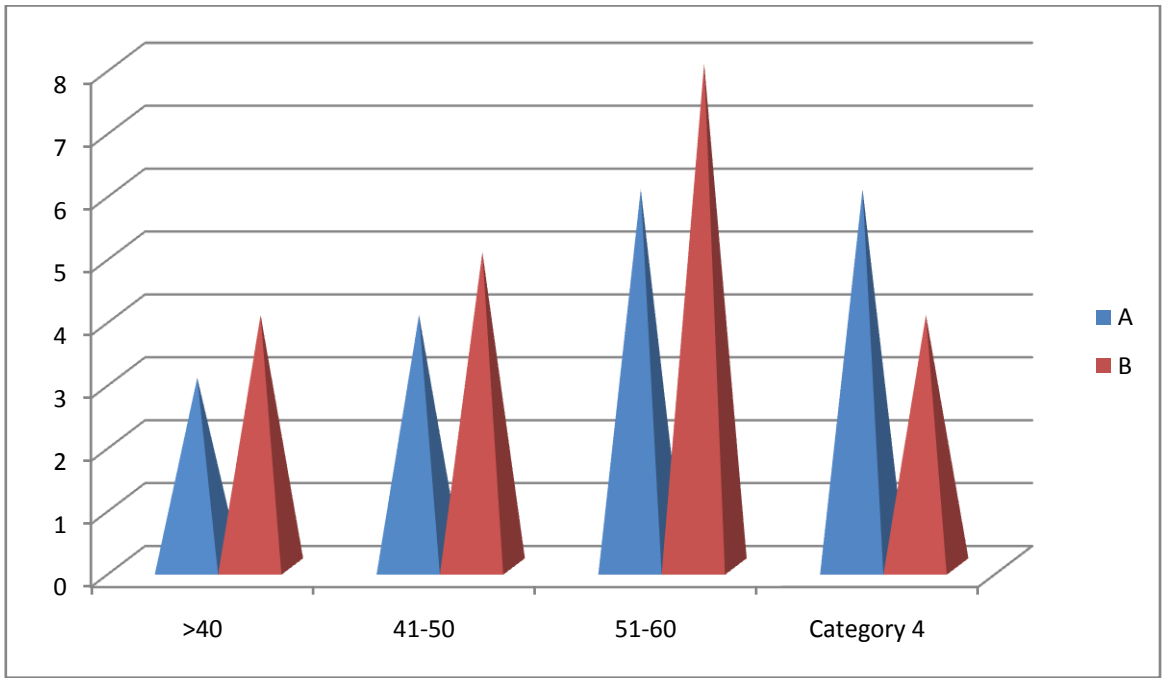
TECHNIQUE	A	B	PERCENTAGE
CONTINOUS	25	25	50%
INTERMITTENT	25	25	50%



50 % of the population in the study belong to Group A,in which them intermittent X suturing were used,and another 50 % belong to Group B in wthich them continous suture were used.

RISK FACTORS

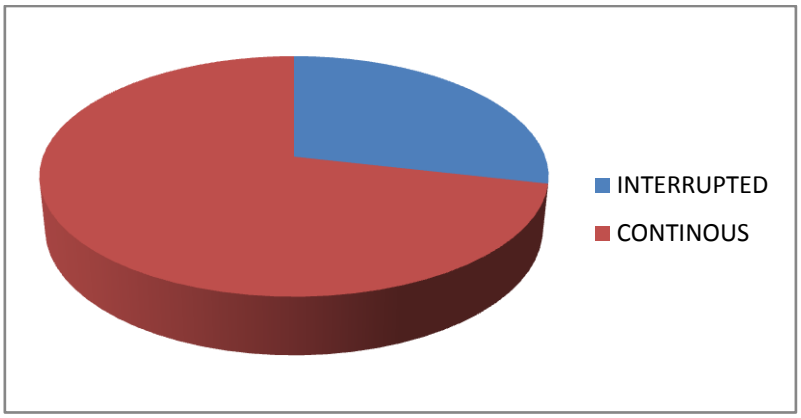
AGE GROUP	A	B	PERCENTAGE IN GROUP A	PERCENTAGE IN GROUP B
<40	3	4	6%	8%
41-50	4	5	8%	10%
51-60	6	8	12%	16%
>60	6	4	12%	8%



In this study we considered risk factors of the patient like obesity,Diabetes,patient on chronic corticosteroid usage,and on chemotherapy /radiotherapy.

WOUND DEHISCENCE
EMERGENCY CASES

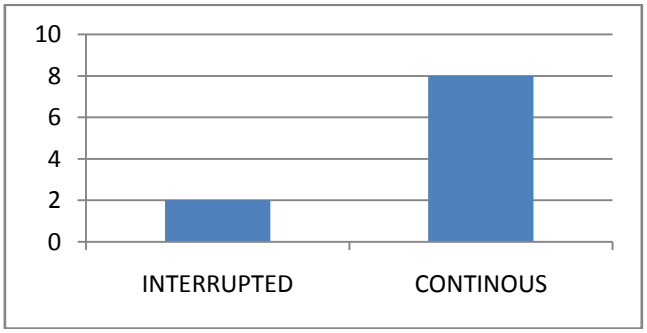
Interrupted X suture	**4**
Continous	**10**



P value=0.0347

ELECTIVE CASES

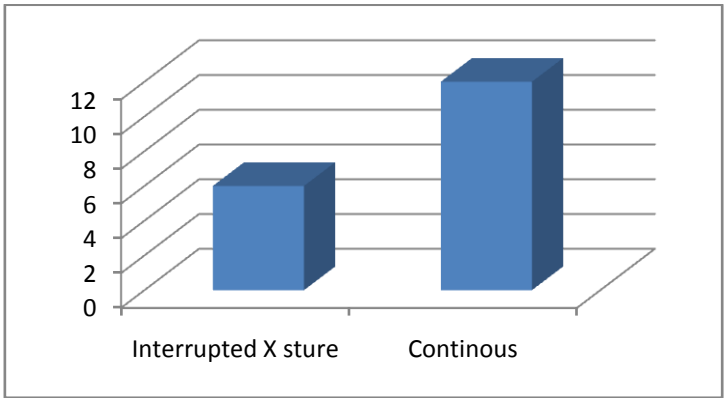
INTERRUPTED X SUTURE	**2**
CONTINOUS	**8**



P value=0.021
Out of 100 patients,6 patient in which intermittent X suturing was done developed burst abdomen,18 patients from continous group developed burst abdomen with significant p value of <0.05

PROLONGED POST OP HOSPITAL STAY
EMERGENCY CASES

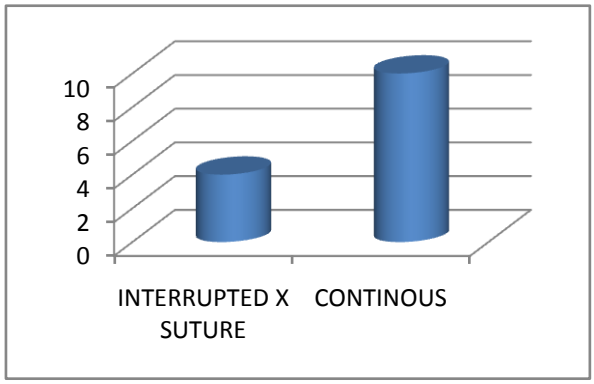
Interrupted X suture	**6**
Continous	**12**



P value=0.044

ELECTIVE CASES

Interrupted X suture	**4**
Continous suture	**10**

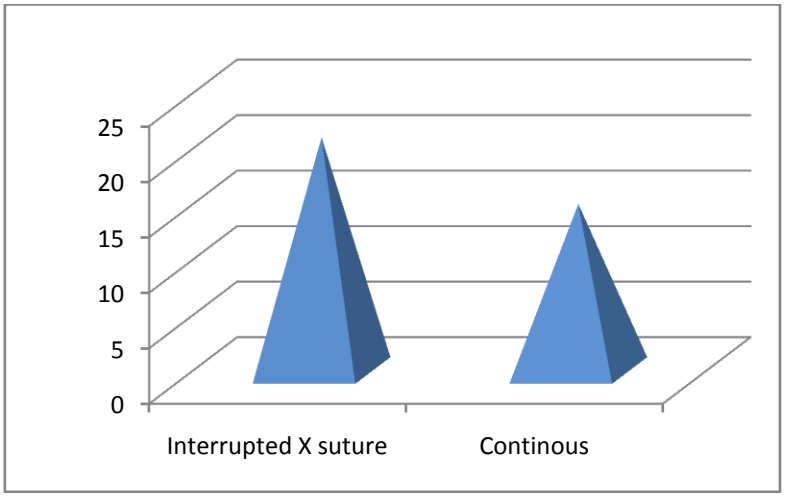


p value=0.0347

NORMAL WOUND HEALING

EMERGENCY CASES

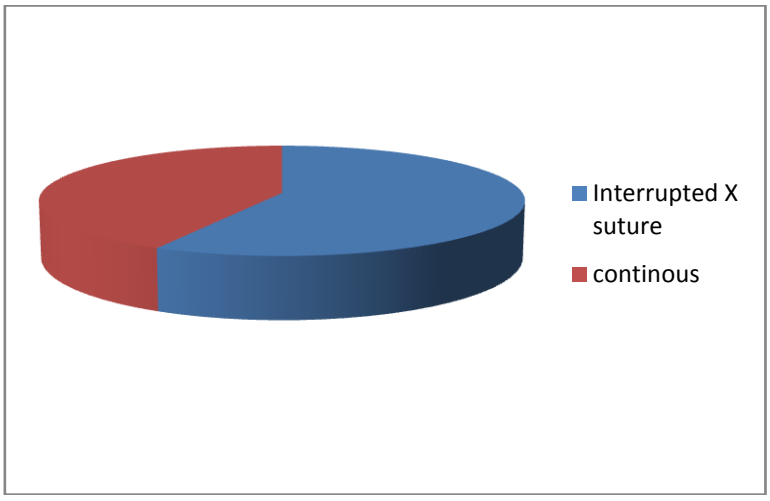
Interrupted X surure	**21**
Continous	**15**



P value=0.03478

ELECTIVE CASES

Interrupted X suture	**23**
Continous	**17**



p value=0.02108

INCISIONAL HERNIA
EMERGENCY CASES

Interrupted X suture	**1**
Continous suture	**7**

P value=0.013

ELECTIVE CASES

Interrupted X suture	**1**
Continous	**6**

P value=0.026

V. Summary

WOUND DEHISCENCE, is a dreaded complication that leads to infectious complications, mentaldi stress, prolonged hospital stay, sepsis, resurgeryetc. Host factors like diabetes, obesity, immunocompramised status, patient, malignancy completed chemotherapy ,radiotherapy, surgeons expertise,technique, suturingmaterial,any factors that leads to increased intraabdominal pressure.

Continous suturing of rectus sheath,in an emergency cases leads to increased rate of wound dehiscence in the post operative period leading on to formation of incisional hernia in the future,hence such a patients needs resrgery in the post operative period in the hospital or may undergo for incisional hernia repair in the future.Disadvantages of continous sheath closure includes, single knots are are usually placed.Hence if patients developes wound infection ,or any factors that increases intra abdominal pressure leads to give away of rectus.In contrast if Interrupted X suturing is applied,three or four intermittent knots will hold the rectus that prevents the formation of wound dehiscence.

VI. Conclusion

Hence study conducted in 100 patients who underwent laparatomy 50 patients in which them Interrupted X suture was applied,they were followed up in the early post operative period and regular follw up.6 of the patients developed wound dehiscence,in contrast with control group in which 18 patients developed burst abdomen.2 of our patients from the study group developed incisional hernia,13 from control group developed incisionalhernia.Therefore,InterruptedX suturing technique overweighs the disadvantages of the continous suturing technique.Hence the technique should be considered.

Bibilography

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