

ORIGINAL RESEARCH

Clinical Profile and Management of Incisional Hernia in a Rural Tertiary Care Hospital

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ABSTRACT

Background:The present study is a Clinical Profile and Management of Incisional Hernia in a Rural Tertiary Care Hospital done at Kamineni Institute of Medical Sciences, Narketpally, from October 2015 to September 2017.

Materials and Methods: Forty cases of incisional hernia which were admitted in Kamineni Institute of Medical Sciences were studied. The statistical data and analysis of the cases studied during this period are presented in this study.

Results: It is more common in females than in males with a ratio of 4.71:1. Incidence of incisional hernia was highest in the age group ranging from 40- 60 years. Most of the patients presented with swelling (82.5%) and swelling with pain (12.5%). Incisional hernia was more common in patients with previous history of gynecological operations (52.5%). The incisional hernia was more common in the infra-umbilical region (52.5%). In majority of patients (95%) the incisional hernia occurred within 3 years of previous operation. The size of the hernial defect less than 40sq.cms was found in 22 patients (55%).33 patients (70%) underwent mesh repair (30 Onlay and 3 sublay repairs), which had good outcome and minimal post operative complications whwn compared to anatomical repair. Post-operative complications included wound infection in 5 patients (12.5%) followed by seroma in 3 patients (7.5%) and no complications in 31 patients. There was only one recurrence constituting for 2.5% of total forty cases reported, and there was zero mortality in the study.

Conclusion: Wound infection following previous surgery was the most important risk factor associated with incisional hernia. The other risk factors were obesity and COPD. Polypropylene mesh repair is superior to anatomical repair as it has less recurrence.

Keywords: Anatomical repair, Etiology, Incisional hernia, Mesh repair.

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INTRODUCTION

Incisional hernia has followed abdominal surgery like a shadow for more than a century now. Incisional hernia is the one true iatrogenic hernia. Incisional hernias are any herniation of the anterior abdominal wall that occurs through a previous surgical incision.^[1] Ian Arid defines incisional hernia as a diffuse extrusion of peritoneum and abdominal contents through a weak scar of an operation or accidental wound. Incisional hernia occurs in 5-11% of patients subjected to abdominal operations.^[2,3] Many factors are associated with incisional hernia like age, sex, obesity, chest infections, type of suture material used and most important wound infection.^[2] All these present a challenging problem to the surgeon.

Incisional hernia usually starts early after surgery, as a result of failure of the lines of closure of the abdominal wall following laparotomy. If left unattended they tend to attain large size and cause discomfort to the patient or may lead to strangulation of abdominal contents. Regardless of the underlying cause, it can also be described as a loss of the tendinous insertion of the linea alba. Like a tendinous transection in the forearm, the lateral obliques tend to atrophy and fibrose.^[4] Furthermore, an incisional hernia can incarcerate, obstruct, perforate or can cause skin necrosis all of which markedly increase the risk to patient's life. With the advent of anesthesia, antisepsis, antibiotics and greater understanding of anatomy, the scientific approach to hernial treatment dawned.

Currently by the judicious use of the above three concepts, incisional hernia is repaired with least morbidity, mortality and recurrence rates. Almost every surgeon has got his own techniques and may modify it to suit the situation.

Newer methods of hernia repair like laparoscopic technique have improvised the management of incisional hernia by reducing the morbidity and less hospital stay to the patient. This study has been undertaken to assess the magnitude of this problem, various factors leading to development of this condition and the different modalities of treatment practiced in our set up.

Aim

To study the clinical profile and management of incisional hernia

Objectives

1. To find out the distribution of incisional hernia according to age and sex.
2. To identify various modes of presentation of incisional hernia.
3. To study the outcome of various modalities of treatment (Anatomical repair and Mesh repair).
4. To study the immediate postoperative complications of repair of incisional hernia.

MATERIALS & METHODS

The present study was carried out in the Department of General Surgery, Kamineni Institute of Medical Sciences, Narketpally. The study includes 40 patients with Incisional hernia who were admitted and operated during the period from October 2015 – September 2017.

Inclusion criteria:

All the patients within age group of 15yrs-70yrs coming to General surgery OPD in the time period of October 2015 to September 2017

Exclusion criteria:

- Incisional hernias associated with other abdominal wall hernias
- Patients aged >70 years

Methods:

The present study "A CLINICAL PROFILE AND MANAGEMENT OF INCISIONAL HERNIA IN A RURAL TERTIARY CARE" is a prospective study which has been carried in Department of General Surgery, Kamineni Institute of Medical Sciences, Narketpally, Nalgonda, during the period of October 2015 to September 2017.

A total number of forty cases were studied and the follow up period varied from 3 months to 24 months. Exclusion criteria included incisional hernias associated with other abdominal wall hernias and patients aged above 70 years. Before enrolling patients for the study, written, informed and valid consent was obtained from all patients.

A detailed history of all patients was taken and a thorough clinical examination was done as a very important step to determine the type and cause of hernia. All patients were analyzed in various aspects like age, sex, risk factors, mode of presentation, previous operation and site of previous scar. Patients were also evaluated for other risk factors like obesity, Diabetes Mellitus and malignant disease.

Routine investigations like Blood, Urine, CXR, and ECG were done. All the cases were operated and procedure adopted was anatomical repair or mesh repair. Selection of operative procedure was based on size of defect of incisional hernia. In case of defect size less than 2cm - anatomical repair was done. For large defects mesh repair was performed.

The patients were closely followed up for early post-operative complications. Long term complications like recurrence, chronic infections and sinus tract formation were also evaluated as far as possible. Data is collected from all patients and analyzed. Certain observations were made.

A master chart dealing with all aspects has been designed and presented.

RESULTS

Table 1: Distribution of Patients according to Age (n=40)

Age Group (in Years)	NO. of Patients (Percentage)
11 – 20	1(2.5%)
21-30	4(10%)
31 – 40	10(25%)
41 – 50	11(27.5%)
51 – 60	12(30%)
61 – 70	2(5%)
Total	40 (100 %)

From the above table it is learnt that the incidence of incisional hernia is maximum in the age group of 31-60 years (82.5%). In this study the youngest patient was 16 years and the oldest was 70 years.

Table 2: Distribution of Patients according to Sex (n=40)

Sex	No. of Patients (Percentage)
Males	7(17.5%)
Females	33(82.5%)
Total	40 (100 %)

In this study of 40 cases, it has been found that incidence of incisional hernia is more common in females than in males and the overall M: F ratio is 1:4.71.

Table 3: Mode of Presentation (n=40)

Presenting Complaints	NO. of Patients (Percentage)
Swelling	33(82.5%)
Swelling and Pain	5(12.5%)
Pain	2(5%)
Total	40 (100 %)

In our study, 33 patients (82.5%) presented with only abdominal swelling, 5 patients (12.5%) presented with abdominal swelling and pain in abdomen, 2 patients (5%) presented with pain abdomen as the chief complaint.

Table 4: Size of the Defect (n=40)

Defect Size (in sq.cm)	NO. of Patients (Percentage)
Upto20	6(15%)
21 – 40	16(40%)
41 – 60	13(32.5%)
61 – 80	5(12.5%)
Total	40 (100 %)

From the above table, 6 patients had hernial defect which measured upto 20 Sq.cm. 16 patients had defects between 21- 40 Sq.cm. 13 patients had defects between 40 - 60 Sq.cms and 5 patients had defects more than 60 Sq.cm

Table 5: Previous Surgeries Undergone (n=40)

Past Surgery	NO. of Patients (Percentage)
Hysterectomy	13(32.5%)
L.S.C.S	7(17.5%)
Tubectomy	1(2.5%)
ExploratoryLaparotomy	8(20%)
Appendectomy	7(17.5%)
OpenCholecystectomy	2(5%)
Miscellaneous(Hernioplasty,Nephrectomy)	2(5%)
Total	40 (100 %)

From the above table, it is found that in our study 52.5% of patients had undergone gynaecological procedures. Among which Hysterectomy with/without Bilateral salpingo oophorectomy was the most common operation followed by LSCS. The GI surgeries account for 47.5% which includes Exploratory laparotomy for intestinal obstruction, DU perforation, Appendicular perforation and Miscellaneous.

Table 6: Previous Incisions given (n=40)

Past Surgery	NO. of Patients (Percentage)
LowerMidline Vertical	11(27.5%)
CompleteMidlineVertical	6(15%)
UpperMidline	3(7.5%)
Paramedian	1(2.5%)
McBurney's	6(15%)
LowerTransverse	10(25%)
Miscellaneous(Subcostal,Lumbar,Inguinal)	3(7.5%)
Total	40 (100 %)

The patients underwent previous surgeries using mid-line vertical incision in 15%, lower midline vertical abdominal incision in 27.5%, upper midline incisions in 7.5%, McBurney's incision in 15%, and 25% lower transverse incisions and other miscellaneous incisions comprising of 7.5% which led to the incidence of incisional hernias.

Table 7: Risk factors responsible for occurrence of incisional hernia during previous operations (n=40)

Post Operative Complicationsof Past Surgery	NO. of Patients (Percentage)
No.Complications	15(57.5%)
Wound Infection	10(25%)
Obesity	7(17.5%)
WoundDehiscence	5(12.5%)
Post-OperativeCough	3(7.5%)
Total	40 (100 %)

In our study, 17 patients had previous post-operative complications in the form of wound infection (10 patients) and wound dehiscence (7 patients). The other risk factor was obesity (7 patients) and post-operative cough (3 patients). 15 patients had no complications following previous surgery. None of the patients had other risk factor like malnutrition, stricture urethra, generalized wasting, avitaminosis, malignant disease, patients on steroid therapy and alcoholism.

Table 8: Time of onset of hernia after previous surgery (n=40)

Duration Since Surgery	No. of Patients (Percentage)
0-3Months	7(17.5%)
>3months-<1 year	20(50%)
1 year – 3 years	8(20%)
>3years	5(12.5%)
Total	40 (100 %)

From the above data it is found that in our study 7 patients (17.5%) presented with incisional hernia within 3 months of the previous surgery, 20 patients (50%) noticed swelling at the operated site within 3 months to one year of surgery and 8 patients (20%) within 1-3 years of surgery i.e., all of them developed incisional hernia within 3 years of surgery

Table 9: Anatomical & MESH Repair (n=40)

Type of Repair	NO. of Patients (Percentage)	
AnatomicalRepair	7(17.5%)	
Mesh Repair	Onlay	30(20%)
	Sublay	3 (12.5 %)
Total	40 (100 %)	

In a total of 40 patients, 7 underwent Anatomical Repair, compared to 33 patients who underwent Mesh Repair. Among these 33, Onlay mesh repair was done for 30 patients which comprises of 75% whereas sublay mesh repair is done for 3 patients comprising of 12%.

Table 10: Post-Operative Complications (n=40)

Complications	NO. of Patients (Percentage)
NOComplications	31(77.5%)
Wound Infection	5(12.5%)
Seroma	3(7.5%)
Death	0(0%)
Recurrence	1(0%)
Total	40 (100 %)

In our study, 31 cases had no complications. 5 patients had wound infection and were managed by regular dressings and appropriate antibiotics according to culture and sensitivity reports. 3 patients had seroma formation which was treated by aspiration and pressure dressing. There was 1 recurrence due to mesh infection. There was no surgery related mortality in this study.

DISCUSSION

Any hernia of the anterior abdominal wall occurring through a previous surgical incision is incisional hernia.^[1] All patients with incisional hernias do not require extensive diagnostic tests.

Incisional hernia is usually a clinical diagnosis. Ultrasonography is the most useful diagnostic test and will often reveal an impalpable defect, particularly in obese patient. Other associated intra-abdominal pathology can also be detected which can be dealt with during operation.

Other investigations are done as routine to assess the fitness for operation like Hb%, urine examination, FBS & RBS for diabetes, blood urea, blood grouping and typing; blood urea, serum creatinine for renal function.

ECG for heart diseases and Chest X-Ray for lung diseases.

Forty cases of incisional hernia admitted in Kamineni Institute of Medical Sciences for treatment between October 2015 - September 2017 are presented in this dissertation.

The maximum age incidence of incisional hernia in our study has been 40-60 years as maximum cases of post Exploratory laparotomy are recorded. Ellis, Gajraj and George in their study noticed a mean age of 49.4 years.^[5] The youngest patient in our study was 16 years and the oldest was 70 years.

The sex incidence of incisional hernia among the 30 cases studied is 1:4.71(M: F) approximately showing a female preponderance. This is because of laxity of abdominal muscles due to multiple pregnancies and also an increased incidence of obesity in females. In comparison with Western countries, incisional hernia in Indians occurs earlier, the reason being early marriage and multiple pregnancy.^[6]

Ellis, Gajraj and George obtained an incidence of 64.6% female population in their study of 383 patients.^[5] J B Shah studies and Goel and Dubey series have male to female ratio 1:1.17 and 1:1.25 (M:F) ratios respectively.^[7,8] Md. Mukhtar Naved, Shital Malua, et al had female preponderance with ratio of 1:9.^[9]

Emergency operation has been reported to carry a higher risk of incisional hernia. Bose et al,^[10] reported in their study that 50% of incisional hernia developed following emergency surgery. 70% of our patients developed hernia following emergency surgery as reported by Umeshchandra DG et al,^[6] Millbourn et al and Carlson et al also reported that incisional hernia is common in females undergoing gynaecological surgeries constituting for 68% and 57% respectively in which lower abdominal incisions are made.^[11,12] In our study 52.5% of patients had undergone gynecological procedures and 47.5% of patients have undergone emergency laparotomies.

Almost all patients presented with abdominal swelling and pain (95%). Only 2 out of 40 patients (5%) presented with pain as the only symptom. Intermittent swelling and pain were found to be the common presentation which was present in 32 cases (53.3%).^[9]

Clinical Manifestations

The patient complains of an unsightly bulge in the previous operation scar as well as of pain and discomfort. They often suffer from a heavy sickening, dragging sensation aggravated by coughing and straining. Sixty percent of patients with incisional hernia do not experience any symptoms. In large dependent hernias, areas of skin may undergo pressure ischaemic necrosis and may ulcerate and rarely the hernia may rupture. If the hernia strangulates, the symptoms

of intestinal obstruction and ischaemic bowel will supervene. Intertrigo may develop in the deep crease between the hernia and abdominal wall. There is often a history of repeated mild attacks of subacute intestinal obstruction, manifesting as colicky pain and vomiting. Rupture of large incisional hernia is encountered occasionally. Defects can be palpated whether single or multiple. Clinically it can be differentiated into enterocele or omentocele. Muscle tone can be assessed by presence of malgagnie's bulgings.

In our study 52.5% of the incisional hernia occurred in Infra-umbilical (Lower midline vertical/ Lower transverse) incisions. This may be because of the following reasons:

1. Intraabdominal pressure is higher in lower abdomen compared to upper abdomen in erect position i.e., 20 cm of water and 8 cm of water respectively.
2. Absence of posterior rectus sheath below arcuate line.
3. This incision is used in gynecological surgeries who have poor abdominal wall musculature.
4. This is also because of faulty technique and use of absorbable suture material.

This is comparable with A B Thakore et al,^[13] studies (67.1%) and Goel and Dubey studies (44.6%).^[8] Over 52.5% of cases occurred following gynecological procedures (Hysterectomy, Tubectomy, Caesarean sections). This may be because most of these procedures were done through lower midline incisions. Ponka in his study noted 36% incidence.^[14]

In the study conducted by Naved et al,^[9] 73.3% of incisional hernia was observed in Infra-umbilical midline incision. Similarly, Millbourn et al and Carlson et al also reported that incisional hernia is common in females undergoing gynaecological surgeries in which lower abdominal incisions are made.^[11,12]

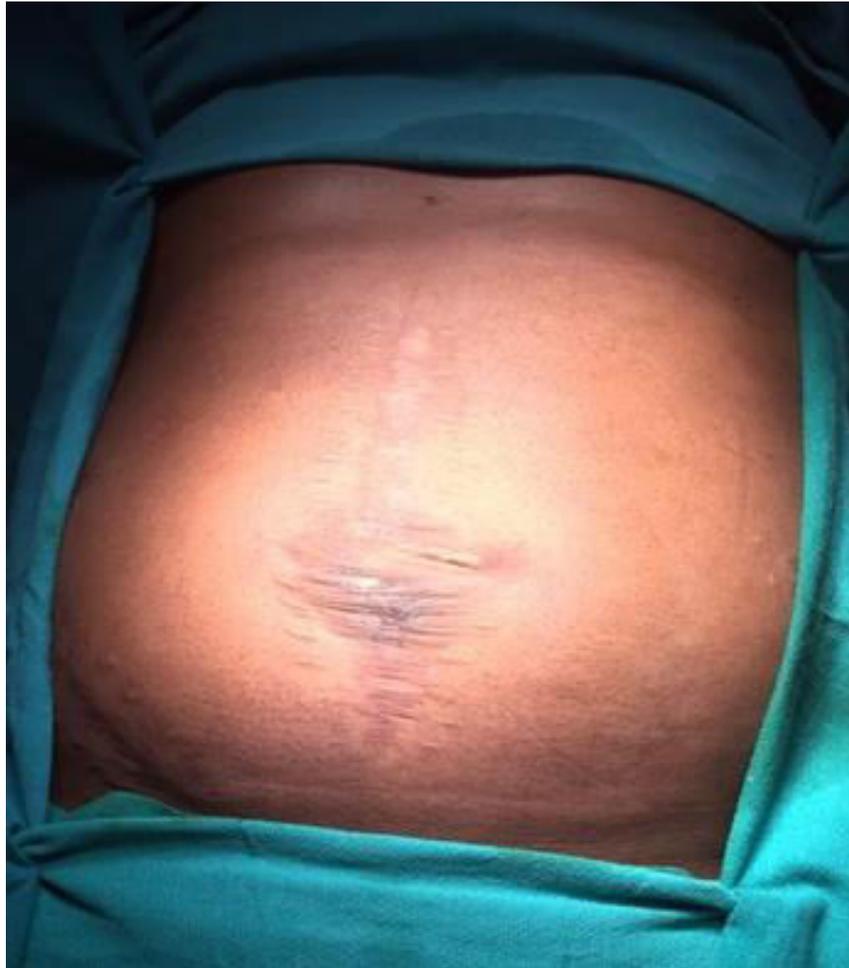


Figure 1: Peri-Operative Picture of Incisional Hernia

Maximum number of patients i.e., 57.5% presented within 1 year of the previous surgery, though all the 40 patients under study presented within 3 years of previous surgery compared to the study conducted by Naved et al,^[9] where in Maximum number of cases 24 (40%) reported between 1–2 years of appearance of incisional hernia followed by 18 cases (30%) reporting between 6 to 12 months.

During the clinical examination in our study 22 patients (55%) were found to have hernial defect of up to 40sq.cms and 18 patients (45%) had defects more than 40sq.cms.

Jack Abrahamson believes that mesh repair is excellent method of repair for large ventral abdominal hernias but has not specified the size of the defect.^[15] In a study done by Umeshchandra DG et al,^[6] 28 out of 30 cases in which polypropylene mesh hernioplasty was done by inlay and onlay technique there is no recurrence and any major complication in any case was found during the follow up study. Burger JW et al. also reported that mesh repair results in significantly lower recurrence rate, less discomfort and it is not generally associated with increased incidence of complications.

In our study, polypropylene mesh and the suture material of the same type was used to repair the incisional hernias and the technique of the repair was decided by the size of the hernial defect, abdominal muscle tone, whether hernial defect could be approximated without tension and general condition of the patient. 33 cases out of 40 cases were treated with polypropylene mesh repair and 7 cases with anatomical repair.



Figure 2: Skin Incision Including the Previous Scar



Figure 3: Raising the Flaps and Opening of Rectus Sheath



Figure 4: Onlay Mesh Placement After Suturing the Rectus



Figure 5: After Complete Onlay Mesh Fixation

Seroma collection in suture line (AR-3, MR-1), and wound infection (AR-0, MR-5) occurred in both the modalities of repair which were treated by regular dressings and appropriate antibiotic medication. Khaira H.S. et al,^[16] reported seroma formation in 6 out of 35 patients and wound infection in 1 out of 35 patients.

In our study one case is reported to have had recurrence, and no mortality reported. However, the follow-up period was variable and short to comment upon.

Usher reported zero percent recurrence in 48 patients who were treated by polypropylene mesh repair.^[14] Jacobus W.A et al,^[17] reported a 10 year cumulative rate of recurrence of 63% in anatomical repair and 32% in mesh repair. The recurrence rate thus varies in different studies but all studies favour mesh repair to decrease the recurrence rate.

With thorough patient evaluation, proper selection of cases, pre-operative skin preparation, meticulous operative technique, use of non-absorbable sutures for musculo aponeurotic tissue, use of suction drain, use of peri-operative broad-spectrum antibiotics, nasogastric aspiration, early ambulation and chest physiotherapy, post operative complications were reduced.

With the use of prosthetic mesh, defects of any size can be repaired without tension, and recurrence is minimized. The polypropylene mesh, by inducing inflammatory response sets up scaffolding that in turn induces the synthesis of collagen. Thus, the superiority of mesh repair over suture repair can be accounted for.

This study may not reflect all the aspects of incisional hernia, as the series is small and follow up has been for a short period. Laparoscopic incisional hernia repair is the newer modality, which requires longer learning curve.

Post- operative care:

- Nasogastric aspiration was done 2 hourly to keep stomach decompressed. Ryle's tube was removed once patient passed flatus.
- Deep breathing exercises were commenced as soon as patient was able to do them. Patients were encouraged to move limbs while in bed.
- Operative wound was dressed and supported with Elastoplast. All patients were instructed to support their operated wound in case of cough or vomiting.
- Chest physiotherapy and tincture benzoin inhalations were started from the post-operative evening.
- I/V fluids – till patient passed flatus.
- Early limited ambulation was done as soon as patient was able to bear the pain.
- Negative suction drain was kept till the drainage became less than 25 cc.
- Broad spectrum antibiotics continued till the removal of suction drain.
- Laxatives – to avoid straining while passing stools.
- Skin sutures removed on 8th -10th post-operative day.
- Following discharge, patient was advised to restrict heavy work for 6 months and in child bearing age, females were advised to avoid pregnancy for 1yr.

CONCLUSION

- Incisional hernia is a challenging operation for a surgeon in view of its high recurrence rate.
- As per the present study, incisional hernia is more common in females and mostly seen after previous gynecological surgeries involving infra-umbilical incisions.
- All cases presented with swelling and few cases had associated pain in the swelling.
- Mesh repair was done in maximum number of cases with no recurrence of hernia. The one recurrence which occurred was in the patient who underwent anatomical repair.
- Infection rates were minimal and zero mortality was observed.

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REFERENCES

1. Jeffrey A. Blatnik, Michael J. Rosen : Shackelford's Surgery of Alimentary tract: 7th ed. Philadelphia : Elsevier, 2013; 597-612.
2. Bucknall TE, Cox PJ, Ellis H. Burst abdomen and incisional hernia: A prospective study of 1129 major laparotomies. British Medical Journal 1982;284:931-3
3. Mudge M, Hughes LE. Incisional hernia: A 10 year prospective study of incidence and attitudes. Br J Surg 1985; 72: 70 -1
4. DuBay DA, Choi W, Urbanek MG, et al: Incisional herniation induces decreased abdominal wall compliance via oblique muscle atrophy and fibrosis. Ann Surg 245:140, 2007.
5. Ellis H, Gajraj H, George CD. Incisional hernias- when do they occur? Br J Surg 1983; 70: 290
6. Umeshchandra DG et al., Sch. J. App. Med. Sci., 2015; 3(1B):80 - 84.
7. Shah JB. Incisional hernia- A study of 50 cases. Indian Journal Of Surgery 1977; 39: 353-56

8. Goel TC, Dubey PC. Abdominal incisional hernia- Anatomical technique of repair. *Indian Journal Of Surgery* 1981;43:324-27
9. Md. Mukhtar Naved, Shital Malua, Pankaj Bodra, Priya Shalini Lakra, Nishant, Anup Kumar Tirkey. Study of clinical profile and management of incisional hernia. *International Journal of Contemporary Medical Research* 2017;4(4):965 -967.
10. Bhutia WT, Sarath Chandra S, Srinivasan K, Anantha Krishnan N; Factors predisposing incisional hernia after laparotomy and influencing recurrence rates after different methods of repair. *Ind J Surg.*, 1993; 55(11): 534 -543.
11. Millbourn D, Cengiz Y, Israelsson LA. Effect of stitch length on wound complications after closure of midline incisions: A randomized controlled trial. *Arch Surg.* 2009;144:1056 -9.
12. Carlson MA. New developments in abdominal wall closure. *Chirurg.* 2000;71:743-53.
13. Parekh JN, Shah DB, Thakore AB. Incisional hernia- A study of 76 cases. *Indian Journal Of Surgery* 1988; 50: 49 -53
14. Ponka JL, *Hernias of the abdominal wall.* Philidelphia, PA: WB Saunders; 1981.
15. Abrahamson Jack. "Hernias" Chapter 14 th in Michael J Zinner, Seymour Schwartz, Harold Ellis, Editors. *Maingot's Abdominal Operations.* Volume 1. 10 th edition. Connecticut: Prentice hall international inc; 1997. 479pp.
16. Khaira HS, Lall P, Hunter B, Brown HJ. Repair of incisional hernias. *J R Coll Surg Edinb* 2001; 46: 39-43
17. Jacobus WA et al. Long term follow-up of a randomized controlled trial of suture versus mesh repair of incisional hernia. *Annals of Surgery* 2004; 240(4): 578 -8