Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2015; 3(1B):80-84 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2015.v03i01.019

Research Article

Clinical Profile and Management of Incisional Hernia with Special Reference to Use of Polypropylene Mesh: A Case Series

Umeshchandra D.G.[1], Ankur Bhatia[2], Varun Patnam[3]
Depart of Surgery, Basveshwar Teaching and General Hospital, Gulbarga, Karnataka-585105, India

***Corresponding author**
Dr. Umeshchandra D.G
Email: drumesh27@gmail.com

Abstract: Incisional hernia represents the defect in the parietal abdominal wall fascia through which intra-abdominal or pre-peritoneal contents can protrude due to architectural deterioration of muscular aponeurosis or they may develop from failed healing of anterior abdominal wall incision. It is a common complication of abdominal surgery and an important source of morbidity. It may be repaired using either anatomical, mesh or laparoscopic methods. This is a clinical study done to understand the relative importance of various factors and predisposing to incisional hernia, the occurrence with relation to the factors and selecting the most optimum technique which has least recurrence rate especially the use of Polypropylene Mesh. This study was conducted in patients who were admitted at our institution over a period of 2 years with complain of incisional hernia. 30 patients were analyzed for factors resulting in occurrence of incisional hernia & selecting the most optimum technique of repair, which has least recurrence rate specially the use of polypropylene mesh repair. In this study majority of the patients presented within 6 months, with incidence more common in females, who underwent gynaecological procedures by lower and midline incisions. Its appearance was most common in the age group of 31-40 years. The predominant risk factors being wound infection and lax abdomen. The most common post-operative complications were mainly fever, pain and wound infection. Mesh repair is superior to anatomical suture repair with regard to recurrence of hernia. Polypropylene Mesh is one of the best synthetic materials for repair and "INLAY" mesh repair is the best technique for repair of incisional hernia.
Keywords: Incisional hernia, Risk factors, Polypropylene mesh, Inlay repair, Onlay repair.

INTRODUCTION

The incisional hernia is the result of failure of the lines of closure of the abdominal wall following laparotomy. Incisional hernia is the second most frequent type of hernia after inguinal hernia owing to rapid increase in number of abdominal operations performed. Ellis *et al*. [1], Mudge *et al*. [2] reported that incidence of incisional hernia after major abdominal surgery is 5-10% even at the best centres. It reaches 10% or more with prolonged follow-up. Most of them presenting within one year of initial surgery and upto 80% appear within two years.

Abrahamson[3] reported that many factor singly or in various combinations, may cause failure of wound to heal satisfactorily and may lead to the development of a post operative hernia. Transverse incisions are associated with fewer complications and there is lower incidence of late incisional hernia after transverse compared with vertical laparotomy [4]. Abrahamson [5] reported that layered closures are followed by greater incidence of post-operative hernias than are wounds closed by single layer mass closure technique. Absorbable sutures should not be used for closure of laparotomy wounds. Rubio [6] reported that mass closure with a continuous heavy monofilament polyamide or polypropylene as a single thread or in the form of a commercially available loop is associated with decreased incidence of incisional hernia. Abdominal fascial closure with a continuous non-absorbable suture has a significantly lower rate of incisional hernia [7]. Closing wounds with tension creates an area of pressure necrosis due to pull in opposite direction by abdominal muscles; this pressure necrosis is a primary cause of wound dehiscence [8].

Sepsis is the second major cause of early wound failure; it is a contributing factor in more than 50% of postoperative hernias that develop within one year of operation. Infection causes inflammation and oedema of tissues, which become soft and weakened so that the sutures tear the tissues and pull out under the strain of intra abdominal pressure [5]. Ellis *et al.* [1] reported that obesity leads to threefold increase in herniation and recurrence.

The general condition of patients influences the rate of post-operative ventral hernia. The factors

include age, generalized wasting, malnutrition, starvation, hypoproteinemia, malignant disease, anaemia, diabetes mellitus, liver failure, ascites, prolonged steroid therapy, immunosuppressive therapy and alcoholism [5]. Post operative complications increase the incidence of post-operative hernia. These include prolonged postoperative paralytic ileus intestinal obstruction and chest complications such as chronic obstructive lung disease, pulmonary collapse, bronchopneumonia, emphysema and asthma [5].

Indications for surgery include aesthetic reason for large and unsightly hernia, pain and discomfort, large hernias with small openings, history of recurrent attacks of sub-acute intestinal obstruction, incarceration, irreducibility and strangulation.

During past half century a wide variety of biological and inorganic substances have been advocated and used as prosthesis in repair of various types of abdominal hernia. The use of sheets of non-absorbable synthetic mesh placed across the defect & stitched to the abdominal wall has revolutionized the repair of abdominal wall defects and has rendered obsolete most of the older types of operations. The ideal mesh is one that is cheap, universally available, easily cut to required shape, flexible, slightly elastic and pleasant to handle. Additionally, it should be practically indestructible, capable of being rapidly fixed and incorporated by human tissue. It must be inert, elicit little tissue reaction & consequently not rejected even in the presence of infection. It must be sterlizable and non-carcinogenic.

Polypropylene mesh popularized by Usher [9], meets the requirement of the ideal prosthesis and today is the most commonly used material for repair of these hernias.

MATERIAL AND METHODS

This present study was conducted from November 2011-April 2013 in patients who attended and admitted in Department of Surgery, Basveshwar Teaching and General Hospital attached to Mahadevappa Rampure Medical College, Gulbarga, with complain of incisional hernia. Patients were analyzed for factors resulting in occurrence of incisional hernia & selecting the most optimum technique of repair, which has least recurrence rate specially the use of polypropylene mesh repair.

Criteria for using herniorraphy was Small incisional hernia with muscle defect less than 6 cm or 4 fingers (on leg raising/head raising test for anterior abdominal wall contraction) and Muscle tone of the abdominal wall adequate. Criteria for using prolene mesh for hernioplasty was big incisional hernia with muscle defect more than 6 cm or 4 fingers (on leg raising/head raising test for anterior abdominal wall contraction), in giant ventral hernias in which primary repair is impossible without tension and recurrent incisional hernia with distorted local anatomy with poor muscle tone of abdominal wall.

A total of 30 patients were studied, who were admitted and underwent hernia repair. Following observations were made.

RESULTS

Incisional hernia occurred commonly in patients of 31-40 year (26.67%) age group patients in females and 51-60 years (13.33%) age group in males. There was female preponderance, with male to female ratio being 1:2.67. Most of the cases (76.67%) of incisional hernia developed nearly within 6 months of previous operation. All patients presented with bulge at scar site. In (50%) of cases pain was a prominent symptom, with skin ulceration in (10%) cases. Size of musculoaponeurotic defect at scar site, through which incisional hernia occurred was <6 cm2 in (33.33%) cases and >6cm2 in (66.67%) cases.

Incisional hernia commonly occurred in obese (36.67%) females. Anemia was present in (73.33%) cases and poor muscle tone of abdominal wall was present in (73.34%) cases.

Maximum number of incisional hernia developed after emergency operation on female pelvic organs i.e. caesarean section by lower midline incision (53.33%). Second most common cause was following exploratory laparotomy for perforative peritonitis (40%). Prominent risk factors which lead to occurrence of incisional hernia were wound infection (76.67%), obesity (36.67%), post-operative cough (33.33%), post-operative distension (20%), anaemia (73.33%), burst abdomen (20%), relaparotomy (13.34%) and Diabetes (16.67%) (Table 1). Commonest risk factor present at the time of incisional hernia repair were obesity (36.67%), relaparotomy (13.34%), anaemia and respiratory problem (26.67%) (Table 2).

In 2 cases where defect was less than 6 cm^2 and abdominal tone was good, herniorraphy could be successfully done with no recurrence. In 6(20%) cases where defect was greater than 6 cm^2 abdominal tone was not good and anatomy was distorted, “Onlay mesh” repair could be done. And in 22 cases “Inlay mesh” repair was performed with good outcome (Table 3). No recurrence was found in any case during the follow up study. In 4 out of 30 cases wound was infected during first post-operative week which was cured with conservative approach. Seroma collection occurred in 2 out of 30 cases. Fever, pain and seroma collection were most common short term complications, more frequent in the herniorrhapy followed by “onlay” hernioplasty and “inlay” hernioplasty (Table 4). Polypropylene mesh was found to be excellent synthetic material for repair of giant ventral hernias with strict aseptic precaution

and complete haemostasis during operation. None of the cases required removal of mesh due to complication.

Table 1: Risk factors responsible for occurrence of incisional hernia during previous operation

Responsible risk factor	Number of cases	Percentage
Anaemia	22	73.33
Infection	23	76.67
Burst abdomen	6	20.00
Post-operative distension	6	20.00
Post-operative cough	10	33.33
Obesity	11	36.67
Relaparotomy	4	13.33
Diabetes	5	16.67
Lax abdomen with poor muscle tone	22	73.34

Table 2: Risk factors present at the time of presentation

Risk factor	Number of cases	Percentage
Obesity	11	36.67
Anaemia	8	26.67
Diabetes	5	16.67
Respiratory Problem	8	26.67
Relaparotomy	4	13.34
Hypertension	4	13.34

Table 3: Type of repair done in cases of incisional hernia (n = 30)

Type of repair	Number of cases	Percentage
Anatomical resuturing of layers	2	6.67
polypropylene mesh hernioplasty - Onlay repair - Inlay repair	 6 22	 20.0 73.33

Table 4: Incidence of postoperative complications after incisional hernia repair

Complication	Incisional herniopphaphy (n=02)	Incisional hernioplasty (n=28)	
		Onlay mesh repair n=6	Inlay mesh repair n=22
Fever and pain	1 (50%)	3 (50%)	11 (36.67%)
Wound infection	1 (50%)	1 (16.6%)	3 (10%)
Seroma collection in wound	-	1 (16.6%)	1 (3.34%)
Haematoma collection	-	-	1 (3.34%)
Sinus formation	-	-	-
No complain	1 (50%)	3 (50%)	12 (40%)
Recurrence	-	-	-

DISCUSSION

Incidence of incisional hernia could not be assessed in the study as most of the patients were operated in private or other government hospitals. The incidence of incisional hernia is atleast 10% in various long term studies [1]. The incidence of incisional hernia rose to 18% during emergency midline laparotomy.[10] The female preponderance noticed by us is the usual finding in the literature also. Musca [11] and Molloy *et al*. [12] also noted the higher incidence in females. Mean age of incisional hernia cases reported by Molloy *et al*. [12] was 57 years. Bhutia *et al*. [13] noted the peak incidence of incisional hernia in 30 to 50 years (85%). In our study, incisional hernia most common involved age group in females was 31 to 40 years (26.67%), while in males it was 41 to 50 years (13.33%). The earlier age in females in our study is due to early marriage followed by multiple child births with poor nutritional status, which leaves the abdominal wall weak. In comparison with Western countries, incisional hernia in Indians occurs earlier, the reason being early marriage and multiple pregnancy.

In 36.67% cases obesity was present and this was one of the main risk factor for development of incisional hernia. More than half (73.34%) of patients had poor muscle tone. Bhutia *et al*. [13] reported that obesity was prominent risk factor present at the time of repair. Emergency operation has been reported to carry a higher risk of incisional hernia. Bose *et al*. [14]

reported in their study that 50% of incisional hernia developed following emergency surgery. Our findings probably confirmed their observations as 70% of our patients developed hernia following emergency surgery. In our study, maximum number of incisional hernia developed from infra umbilical midline incision (50%) followed by combined midline supra and infraumbilical (23.33%) cases. similar observation was made by Molloy *et al*. [12] showing incidence of midline incisional hernia in 58% and paramedian in 32%. Bose *et al*. [14] reported vertical midline incision accounted for (82.72%) of incisional hernia. Reason for high incidence of midline infra umbilical incisional hernia is that posterior rectus sheath is deficient below the umbilicus.

Majority of incisional hernia (76.67%) became clinically evident within 6 months of surgery; however 23.33% cases revealed after 6 months. Bhutia *et al*. [13] noted almost the same incidence in their study, 2/3rd cases occurred within a year of primary surgery and only (10.8%) occurred more than 1 year after original operation. Size of musculoaponeurotic defect varied widely in study. It was 6-8 cm in 40% cases, 4-6 cm in 20% of cases and 2-4 cm in 13.33% of cases. Musca [11] mentioned that (72.8%) of his patients with incisional hernia had abdominal defect around 7 cms.

Wound infection, obesity and cough in postoperative period of primary surgery were predominant risk factors. Musca [11] pointed that obesity accounted for herniation in 55.5% of patients. Molloy *et al*. [12] also noted the nearly same incidence of wound infection (52%). Bhutia *et al*. [13] also highlighted, wound infection as predominant risk factor. Fischer *et al*. [15] placed it even more frequently at 88%. Obesity was the commonest predominant risk factor at the time of presentation in our study (36.67%), Relaparotomy (13.34%), respiratory problem (26.67%), diabetes mellitus (16.67%), anemia (26.67%) were other risk factors present at the time of presentation. Respiratory problem was more frequent in study by Validire *et al*. [16] Bhutia *et al*. [13] also reported obesity, severe anemia and relaparotomy as the commonest risk factor present at the time of hernia repair.

2 cases had musculoaponeurotic defect <6 cm2, the size of incisional hernia was not big and the abdominal muscle tone was good, herniorraphy was done successfully without tension over suture line using vicryl and prolene. In 28 cases where musculoaponeurotic defect was >6 cm2 and tone of abdominal wall was poor (lax abdomen). We did prolene mesh hernioplasty. In 6 cases anatomy of region was disturbed for which "Onlay" mesh repair was done. And in 20 cases inlay mesh repair was done.

Rubio [6] noted wound infection and seroma collection in 5.5% of cases after incisional hernia repair, whereas Molloy *et al*. [12] noted it in 8% and 4% cases; Bhutia *et al*. [13] in 15% and 13.7% cases respectively. In our study infection rate (20%) was higher to Molloy *et al*. [12] and seroma collection (20.80%) was similar to that of Bhutia *et al*. [13].

28 cases in which polypropylene mesh hernioplasaty 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*. [17] also reported that mesh repair results in significantly lower recurrence rate, less discomfort and it is not generally associated with increased incidence of complications.

CONCLUSION

To conclude incisional hernia is more common in females who undergo emergency caesarean section. Wound infection, post-operative cough are other important risk factors for occurrence of incisional hernia. Mesh repair is superior to anatomical suture repair with regard to recurrence of hernia. Polypropylene mesh is one of the best synthetic materials for repair and "inlay" mesh repair is the best technique for repair of incisional hernia.

REFERENCES

1. Ellis H, Gajraj H, George CD; Incisional hernias, when do they occur? Br J Surg., 1983; 70(5): 290-291.
2. Mudge M, Hughes LE; Incisional hernia: a 10 year prospective study of incidence and attitudes. Br J Surg., 1985; 72(1): 70-71.
3. Abrahamson J; Factors and mechanisms leading to recurrence of hernias. In Bendavid R editor; Prosthesis in Abdominal wall hernia. 1st edition, Georgetown, Texas: RG Landers, 1994.
4. Grantcharov TP, Rosenberg J; Vertical compared with transverse incisions in abdominal surgery. Eur J Surg., 2001; 167: 260-267.
5. Abrahamson J; Hernias. In Zinner MJ, Shwartz SI, Boston EH editor; Maingot's Abdominal Operation. 10th edition, McGraw-Hill, 2001: 548-572.
6. Rubio PA; Closure of abdominal wounds with continuous non -absorble sutures: experience in 1697 cases. Int Surg., Int Surg., 1991; 76(3):159-160.
7. Hodgson NC, Malthaner RA, Østbye T; The search for an ideal method of abdominal fascial closure a meta-analysis. Ann Surg., 2000; 231(3): 436-442.
8. Bartlett LC; Pressure necrosis is the primary cause of wound dehiscence. Can J Surg., 1985; 28(1): 27-30.
9. Usher FC, Ochsner J, Tuttle LLD Jr.; Use of marlex mesh in the repair of incisional hernias. Am Surg., 1958; 24: 969-974.
10. Mingoli A, Puggioni A, Sgarzini G, Luciani G, Corzani F, Ciccarone F; Incidence of incisional

hernia following emergency abdominal surgery. Ital J Gastroenterol Hepatol., 1999; 31(6): 449-453.
11. Musca AA; Umbilical and ventral herniorrhaphy: A reveiw of 1000 cases. Int Surg., 1967; 48(2): 169-179.
12. Molloy RG, Moran KT, Waldron RP, Brady MP, Kirwan WO; Massive incisional hernia: abdominal wall replacement with marlex mesh. Br J Surg., 1991; 78(2): 242-244.
13. 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.
14. Bose SM, Roshan L, Kalra M, Wig JD, Khanna SK; Ventral hernia – A Review of 175 cases. Ind J Surg., 1999; 61(3): 180-184.
15. Fischer JD, Turner FW; Abdominal hernias: A ten year review. Can J Surg., 1974; 17: 202-204.
16. Validire J, Imbaud P, Dutel D, Duron JJ; Large abdominal incisional hernia repair by fascial approximation reinforced with a stainless steel mesh. Br J Surg., 1986; 73(1): 8-10.
17. Burger JW, Luijendijka RW, Hop WC, Halm JM, Verdaasdonk E G, Jeekel J; Long term follow up of a randomized controlled trail of suture versus mesh repair incisional hernia. Ann Surg., 2004; 240(4): 578-585.