INCISIONAL HERNIA THROUGH NONVERTICAL INCISIONS

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ABSTRACT

Although uncommon, incisional hernia may occur after operations where vertical or paramedian incision is not used. Fifteen patients of incisional hernia through nonvertical incisions in the age group of 22 to 65 years were studied. This included hernia through subcostal incision commonly used for cholecystectomy, gridiron incision, pfannensteil incision and lumbar incisions. Majority of these hernias were due to wound complications and factors which give rise to an increased strain on suture lines. Although the technique for anatomical repair of incisional hernia seems safe and dependable in patients with small defects, but in patients with large musculoaponeurotic defect, prolene mesh hernioplasty has proved successful. In one patient with giant incisional hernia through rooftop incision, large defect was covered with merselene mesh by inlay and onlay technique. After a median follow up of 18 months only one patient (6.6%) developed a recurrence. Merselene mesh has proved to be an excellent material for bridging of wide tissue gaps.

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KEY WORDS : Incisional Hernia; Monofilament nylon; Merselene mesh; Nonvertical incisions.

Introduction

Incisional hernia is a result of failure of lines of closure of abdominal wall following surgery. Wound infection and wound dehiscences are the most serious catastrophe that can follow abdominal operations and incisional hernia may develop within months or few years after surgery [1]. Postoperative ventral abdominal wall hernias more commonly occur in infraumbilical midline incisions than those above the umbilicus. The reported incidence of incisional hernia varies widely between 0.5% to 13.9% of patients undergoing abdominal operations [2]. Although exact incidence of incisional hernia through nonvertical incisions has not been reported but approximately 1% of all transparietal abdominal incisions result in incisional hernia. Incidence can be further reduced by the use of monofilament sutures eg nylon, polyamide, polypropylene and by using mass closure technique.

Although uncommon, incisional hernia may occur after operations where nonvertical incision is used. This includes hernias following grid iron incision after appendectomy, subcostal incision in cholecystectomy or splenectomy, parastomal hernia after colostomy closure, hernia through suture holes or drain holes, laparoscopic ports, hernia in lumbar incisions following nephrectomy or lumbar sympathectomy and through pfannensteil incision in hysterectomy and caesarian section. Incisional hernia through nonvertical incisions is more likely to become obstructed, incarcerated or strangulated and may even endanger patient's life by causing skin necrosis and perforation, if

left untreated. Incisional hernia has a recurrence rate of 9% to 25% [3] and majority of these failures are due to wound complications such as seroma and wound infection [4,5] and other factors that put strain on suture line eg obesity, abdominal distension, violent cough and vomiting [6]. Successful repair of giant incisional hernia can be achieved by using prosthesis eg prolene mesh, merselene mesh and by modifying the anatomical technique [7].

Material and Methods

Fifteen patients of incisional hernia through nonvertical incisions managed during Feb 94 to Feb 99 in various service hospitals are presented in this study. 12 patients were females and 3 males, 66% of them were obese and above forty years of age. Most of the female patients were housewives, rest being farmers and serving soldiers. Age group varied from 22 to 65 years with median age of 46 years. Ten patients had lax abdominal wall with poor muscle tone. All patients were assessed clinically to ascertain the size of defect. Ten patients underwent anatomical repair of incisional hernia in whom the aponeurotic margins could be approximated easily, while in rest mesh repair was done due to large size of defect.

Operative technique

Skin scar was excised by elliptical incision and then incision was deepened to expose aponeurotic layers. Flaps were mobilised and the defect was defined. By another elliptical incision around the defect, the dissection continued down to peritoneum and scar tissue was excised. Layer to layer closure of defect was performed by continuous black monofilament polyamide suture (Sutupack no 1).

The sutures were placed close and deep, one centimetre apart and one centimetre from the wound edge without interlocking [8]. The length of suture used was at least four times the length of the wound. Romovac suction drain was used between the layers of

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repair and subcutaneously in obese patients for 24 to 48 hours. A short course of antibiotics like Inj Ampicillin was used in the postoperative period for three days. Preoperatively the first dose was administered on the morning of surgery. Sutures were removed on the 10th or 12th postoperative day. Surgery was not advised in cases of lumbar incisional hernia. Prolene mesh was used as 'onlay' and 'inlay' graft [9]. Inlay - a piece of mesh is cut to the shape and little larger than the size of defect and was placed on the edges of the musculo-aponeurotic defect deep to the muscle of the abdominal wall. Onlay-a piece of mesh was placed and sutured on the musculo-aponeurotic defect and subcutaneous layer and or skin. All patients were discharged from hospital after removal of sutures and followed up in OPD.

Results

Most of these hernias were Type II hernias and situated in the lateral part of the incision. Incisional hernia in 60% of the patients appeared within one year after operation, while in rest within 2-4 years of original operation. Five patients underwent repair by use of synthetic mesh while rest were managed by layer to layer closure with or without opening the sac. Distribution of patients as per type of incision and nature of surgery is shown in Table 1. The risk factors which were likely to have been responsible for incisional hernia in these patients are listed in Table-2. Clinical presentation of the patients is shown in Table 3. Operation findings are as per Table 4.

All patients had uneventful postoperative recovery except one recurrence following early surgery without use of synthetic mesh in post-cholecystectomy incisional hernia. A case of giant ventral hernia through rooftop incision was repaired by inlay and onlay merselene mesh graft (Figs 1&2). All patients were followed up after surgery for an average of one and a half years (range 6-24 months). Two of the fifteen patients developed seroma and one young lady patient with diabetes in which surgery was undertaken within 6 months of original operation developed further recurrence of her incisional hernia. None of the patients complained of any complication due to mesh or synthetic suture requiring removal of suture material or mesh.

Discussion

The type of incision is one of the most important elements in sound wound healing, and the major one under the control of surgeon. It is well documented that a transverse incision heals firmly without herniation from three to five times as often as does a vertical incision [1]. A transverse incision has a marked advantage of being parallel to the muscle fibres. With the abdominal wall contraction as in coughing, straining, or turning over in bed, tends to approximate the edges in contrast to vertical incisions where the edges of the incision tend to distract. Most of the postoperative hernias can be repaired by use of the patient's own tissues and conventional surgical techniques, but if repair is tried by suturing the tissues under tension, recurrence mostly follows. Besides the technique of abdominal wall closure, suture material used is also important [10]. The absence of tension on the suture line is must. Tension impedes microcirculation, decreases local tissue oxygenation and interferes with

TABLE 1

Distribution of patients

Incision	Surgery	No. of patients	Time interval (in years)
Kocher's	Cholecystectomy	06	< 1
Grid Iron	Appendicectomy	01	< 1
Stomal	Colostomy	01	1-2
Pfannensteil	Hysterectomy	02	2
Transverse	Mayo's Repair	02	< 1
Lumbar	Nephrectomy	02	2
Rooftop	Hepaticojejunostomy	01	1-2

TABLE 2

Risk factors for incisional hernia through nonvertical incisions

Risk factor	Number of patients
Obesity	10 (66%)
Wound infection	5 (30%)
Emergency surgery	4 (24%)
Diabetes mellitus	3 (18%)
Chronic obstructed airway disease	3 (18%)
Recurrence	1 (06%)

Many patients had more than one risk factor[8]

TABLE 3

Common presentation of patients

Symptoms	Percentage
Swelling along incision	
(a) Total	60%
(b) Partial	40%
Dragging sensation / Pain	90%
Subacute intestinal obstruction	20%
Strangulation	0%
Cough impulse	100%
Reducibility	
Total	70%
Partial	30%
Palpable defect	80%

TABLE 4

Operation findings

Operation finding	No. of patients
Size of defect	
4-6 cm	5
6-8 cm	2
8-10 cm	3
> 10 cm	2
Sac	
Unilocular	9
Multilocular	3
Contents	
Large intestine	3
Small intestine	4
Omentum	5

Fig. 1 : Incisional hernia through Rt subcostal part of roof top incision

Fig. 2 : Mesh (inlay & on lay) being placed

proper hydroxylation of prolene and lysine. Normal collagen fibrin polymerization and cross linking cannot occur and disorganisation of scar tissue will result [11].

Prolene mesh was used only in patients where the defect was more than six centimetre in size and in patients of giant ventral hernia. Inlay mesh graft was used in patients where the defect was 6-10 cm, while inlay and onlay mesh graft was used in two patients of giant ventral hernia. In remaining ten patients where the size of defect was less than six centimetre, layer to layer closure with or without opening the sac was done because of good abdominal muscle tone. Approximation of the margins of the defect was possible with polyamide or polypropylene sutures without tension. Both tissues have a low yield stress but polyamide has a lower modulus of elasticity and is thus less likely to cut through oedematous tissues. It

Fig. 3 : Post operative (same patient)

retains its strength for three months and only 16% is lost after one year [12]. It causes the least tissue reaction and is supposed to be better than polypropylene in reducing the tissue susceptibility to infection in contaminated wounds [13]. Incisional hernia is more common in subcostal incision following cholecystectomy as seen in this study due to damage to 8th, 9th & 10th intercostal nerves. Similarly grid iron incision for appendicectomy leads to injury to ilioinguinal nerve. In this study most post-cholecystectomy hernias resulted due to faulty closure of deeper layers in the lateral part of incision. In colostomy and appendicectomy, incisional hernia occurred due to infection and wound disruption. Obesity was a common factor in most of the patients. The risk of herniation due to obesity depends on the increased hazard of wound sepsis with a heavy panniculus. It is also because of increased intra-abdominal pressure that accompanies a markedly thickened omentum and mesentery. All patients underwent repair within two years of operation that caused the hernia. Incisional hernia through nonvertical incisions is more likely to become incarcerated, obstructed or strangulated and can even cause skin necrosis and perforation. All these complications markedly increase the risk to the patients life. The time interval between the operation and development of incisional hernia varied between immediate postoperative period to two years of surgery. Incisional hernia has a recurrence rate of 9% to 25% following first repair [14]. While in this study only one recurrence (6.6%) was seen where repair was undertaken too early. Surgery for recurrent incisional hernia is followed by further recurrence in nearly half of the patients. Majority of these failures are due to wound complications and factors which give rise to increased strain on suture lines or early repair. Ideally repair should be under-

taken one year after the operation that caused the hernia, till wound reaches an absolutely 'dry state'. The obese patients were advised to reduce weight before surgery.

Although incidence of incisional hernia through nonvertical incisions is uncommon, cases still occur due to faulty technique in closure of deeper layers, use of drains, infection, obesity and diabetes. Prevention is possible by use of transverse incisions, aseptic technique, perfect haemostasis, sharp dissection, meticulous closure of deeper layers, mass closure by use of nonabsorbable monofilament suture material, weight reduction and control of diabetes. The merselene mesh is an excellent synthetic material incorporating with the body tissues for the repair of hernia. Repair of the giant ventral hernia becomes technically easy with the use of mesh and gives good results if asepsis is ensured.

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