

Original research article

A prospective observational study to assess the outcome with retro rectus mesh repair for umbilical hernia

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Abstract

Aim: The aim of the study was to evaluate the surgical outcome of retro rectus (muscular) mesh repair for umbilical hernia in adults.

Material and methods: A Prospective study was conducted in the Department of General Surgery, Patna Medical College and Hospital, Patna, Bihar, India for 24 months. All adult patients (age above 18 years) clinically diagnosed as umbilical hernia including in the study. All patients who underwent surgery were given perioperative antibiotics comprising of three intravenous doses of one gram ceftriaxone that is preoperatively, immediately after completion of surgery and eight hours after surgery. Drain if kept, removal was done after 48 hours and patient discharged thereafter. Patients were called for skin staple removal on the tenth postoperative day.

Results: 80 patients who underwent retro rectus mesh repair for umbilical hernia were studied prospectively. The results were studied and analysed. The mean age of patients was 45.3 ± 6.1 yrs (range 32-61). There were 65 females and 15 males who underwent hernia repair. The mean BMI was 28.3 (range 23-29). 19 patients had diabetes, 14 had hypertension, 12 had ischaemic heart disease and 3 had ascites. 12 patients had all three comorbidities together (diabetes, hypertension and ischaemic heart disease). 65 patients had reducible umbilical hernia while 15 had an irreducible hernia necessitating umbilical excision. The mean stay in hospital was 5.5 days (range 3-8 days). No postoperative complications were encountered. There was no recurrence.

Conclusion: We concluded that the intermediate or retro rectus mesh repair for umbilical hernia in adults is a very safe and effective way for treating umbilical hernias.

Keywords: Umbilical hernia, Laparoscopic repair, Retro rectus mesh repair

Introduction

Umbilical hernia is a rather common surgical problem. Approximately 10% of all primary hernias comprise umbilical and epigastric hernias.¹ Approximately 175,000 umbilical hernia repairs are annually performed in the US.² It has been reported that the share of umbilical and paraumbilical hernia repairs among all repairs for abdominal wall hernias increased from 5% to 14% in UK in the last 25 years.³ A similar rise has been reported in a recent multicentre study from Turkey.⁴ In general, umbilical hernias are more common in women than men; however, there are series in which male patients are more frequent.⁵ Typically, a lump is observed around the umbilicus. Pain is the most common indication to visit a physician and undergo a repair.⁶ Recurrence may develop even in cases where a prosthetic mesh is used. Recurrent umbilical hernias often tend to enlarge faster than primary ones and may behave as incisional hernias. An umbilical hernia has a tendency to be associated with high morbidity and mortality in comparison with inguinal hernia because of the higher risk of incarceration

and strangulation that require an emergency repair. Although the number of articles with the title word “umbilical hernia” increased 2.6-fold between the periods 1991–2000 and 2001–2010, there still appears to be a certain discrepancy between its importance and the attention it has received in the literature.⁷ In this paper, the nature of the umbilical hernias is reviewed, and the current options for their surgical repair are discussed. Anatomic Description Many hernias in the umbilical region occur above or below the umbilicus through a weak place at the linea alba, rather than directly through the umbilicus itself, and the natural history and treatment do not differ for these hernias. The European Hernia Society classification,⁸ for primary abdominal wall hernias defines the midline hernias from 3 cm above to 3 cm below the umbilicus as umbilical hernia. The aim of the study was to evaluate the surgical outcome of retro rectus (muscular) mesh repair for umbilical hernia in adults.

Material and Methods

A Prospective study was conducted in the Department of General Surgery, Patna Medical College and Hospital, Patna, Bihar, India for 24 months. After taking the approval of the protocol review committee and institutional ethics committee. All adult patients (age above 18 years) clinically diagnosed as umbilical hernia including in the study. Patients with strangulated umbilical hernias (devitalized omentum or bowel) were excluded from the study. All patients who underwent surgery were given perioperative antibiotics comprising of three intravenous doses of one gram ceftriaxone that is preoperatively, immediately after completion of surgery and eight hours after surgery. All procedures were performed under general anaesthesia. Drain if kept, removal was done after 48 hours and patient discharged thereafter. Patients were called for skin staple removal on the tenth postoperative day. All the events during the postoperative course were recorded.

Surgical Procedure

A vertical incision extending one inch above the umbilicus to one inch below the umbilicus, curving around the umbilicus with a view to save the umbilicus was made. In cases where the hernia was irreducible causing ballooning of the umbilicus, the umbilicus was included in the vertical elliptical incision and excised. In majority of cases the umbilicus was saved. The umbilicus was carefully dissected free from the underlying adherent hernia sac taking utmost care not to damage the umbilical skin. The sac was then dissected all around up to the neck which was identified as a thick fibrous ring. The sac was opened and contents were reduced after careful adhesiolysis. The contents were repositioned into the abdomen. The sac was then closed with a continuous 2-0 vicryl stitch. Two vertical incisions were made one on either side of the midline about 1.5 cm from the midline extending one and half inches above as well as below the extent of defect. Flaps were created from the anterior rectus sheath which was incised vertically. The medial flap was approximated in the midline by a continuous 1-0 polypropylene stitch. A retro rectus space was created by blunt gauze dissection to accommodate the mesh on either side of the midline. A polypropylene mesh was tailor cut to the size of the created retro rectus space and placed on the newly created midline and extending one and half inches vertically and two and half inches horizontally into the retro rectus space beyond the closed peritoneal defect. The mesh was fixed with interrupted 2-0 polypropylene stitches both in the midline and laterally on either sides to keep it stretched over the newly created midline. The rectus muscles were approximated in the midline by interrupted 2-0 vicryl stitches thereby covering the mesh significantly. A negative suction drain was placed over the mesh and brought out through a separate incision and fixed. The lateral flaps of the anterior rectus sheath were approximated in the midline with interrupted horizontal mattress sutures taken by 1-0 polypropylene thereby enclosing the mesh completely. Subcutaneous layer was approximated by interrupted 2-0 vicryl stitches. A

thorough saline lavage was given to the subcutaneous layer prior to approximating the skin. The skin was approximated by staples. Drain was removed 48 hours after surgery and patient discharged after drain removal. Skin staple removal was done on the tenth postoperative day. An abdominal binder was advised for twelve weeks. Patients were followed up for six months from surgery.

Results

80 patients who underwent retro rectus mesh repair for umbilical hernia were studied prospectively. The results were studied and analysed. The mean age of patients was 45.3±6.1 yrs (range 32-61). There were 65 females and 15 males who underwent hernia repair (Table 1). The mean BMI was 28.3 (range 23-29). 19 patients had diabetes, 14 had hypertension, 12 had ischaemic heart disease and 3 had ascites. 12 patients had all three comorbidities together (diabetes, hypertension and ischaemic heart disease) (Table 2). 65 patients had reducible umbilical hernia while 15 had an irreducible hernia necessitating umbilical excision (Table 3). The mean stay in hospital was 5.5 days (range 3-8 days). No postoperative complications were encountered. None of the patients had seromas or wound infections. None of the patients had any pain syndromes. Mean follow up was 6 months. There was no recurrence.

Table 1: demographic profile of the patients

Age in years	45.3±6.1(mean)	Percentage
Gender		
Male	15	18.75
Female	65	81.25
BMI	28.3	

Table 2: Co morbidities

Co morbidities	No. of patients	Percentage
Diabetes	7	8.75
Hypertension	2	2.5
Ischaemic heart disease	0	0
DM/HT/IHD combined	12	15
Ascites	3	3.75

Table 3: Pattern of presentation

Pattern of presentation	Number of patients	Percentage
Reducible	65	81.25
Irreducible	15	18.75

Discussion

The incidence of umbilical hernia in adults continues to escalate. With increasing obesity especially in urban population the condition is assuming epidemic proportions. A multitude of techniques have been described for repair of umbilical hernias but none of them can be considered to be a gold standard. Therefore the process of evolving a good technique continues.^{9,10} Advancing age leads to weakening of tissues especially in the periumbilical region. This leads to the development of defects in the intersecting fibers of the linea alba in juxta position to the umbilical cicatrix.¹¹ Protrusion of preperitoneal fat is followed by development of a hernia sac. As the defect widens the sac becomes bigger and various peritoneal contents find their way into the sac. The commonest is omentum followed by small intestines.¹² Even the large intestine has been encountered in an umbilical hernia.¹³ Since the

neck of the sac is extremely narrow the chances of incarceration are very high.¹³Hence prompt surgical intervention is necessary. In the present study the mean age of the patient was 45.3 ± 6.1 years.

Sex of the patient is also a very important contributory factor.¹⁰In the present study, out of 80 patients 65 were females. Females are more prone to the development of an umbilical hernia. This is usually due to the weakening and laxity caused by stretching of body wall tissues during pregnancy. The incidence is high in multiparous women.¹³Obesity is very important contributory factor.^{10,11} In the present study the mean BMI was 28.3. High BMI is associated with the development of hernias especially in the midline. Increasing deposition of fat leads to weakening of the musculo aponeurotic structures thereby predisposing to hernias. In addition to this, the increased mass of omental fat also causes a persistently raised intra-abdominal pressure which adds to the pathogenesis of a hernia. Obesity also has a negative outcome on the surgical repair. The chances of recurrence are quite high. However in the present study there was no recurrence despite a few patients with high BMI being operated.¹³Medical co morbidities continue to pose impediments in the smooth recovery and positive outcome after surgical repair.^{13,14} In our study 19 patients had diabetes, 14 had hypertension, 12 had ischaemic heart disease and 3 had ascites. 12 patients had all three comorbidities together (diabetes, hypertension and ischaemic heart disease). However none of the patients with medical co morbidities developed any complications. Thyroid dysfunction may also be commonly encountered. However in the present study none of the patients had any thyroid dysfunction.

The traditional Mayo's repair was practised for many years.^{15,16} This involved horizontal double breasting of the flaps at the site of the defect. However the recurrence rate with this technique remained quite high which paved the road for mesh repair.¹⁵ Open mesh repair involves closure of the defect after herniotomy to be followed by only mesh placement. However since the mesh lies in the subcutaneous plane, the complication rate is high. The incidence of seromas and surgical site infections is also high. This leads to a high incidence of mesh infection and recurrence of the hernia. The presence of a mesh in the subcutaneous tissues gives a discomforting sensation of a foreign body. Migration of the mesh has also been described leading to recurrence.¹⁵Laparoscopic repair of umbilical hernia is also practised commonly.¹⁴ The mesh is placed from within the peritoneal cavity and fixed with tacks. The technique has many disadvantages. Pain due to the tacks is a common complication. Pain is intractable and neuralgic in nature. Very few remedies provide relief to such patients. Tacks can also loosen leading to falling of the mesh. This causes exposure of the adherent side of the mesh to the peritoneal contents namely the bowel leading to dense adhesions. This could eventually lead to adhesive intestinal obstruction. The external lax skin over the hernia is left unaltered thereby yielding a poor cosmetic outcome. Therefore in totality laparoscopic approach does not confer any great advantage.¹⁵⁻¹⁷

The technique practised in the present study is based on the assumption that the midline is deficient and weak. Hence there is a need to recreate a new midline from the adjacent strong aponeurotic structures and reinforce the new midline with a mesh taking into consideration that even the aponeurosis could be weak. The umbilicus is safely dissected off the underlying hernia sac without damaging it. The hernia sac is dissected all around up to the neck and then opened. Defining the defect in body wall is extremely important for determining the extent of recreation of the new midline. The anterior rectus sheath is incised on either side of the midline about 1.5 cms from the midline. The vertical extent of the incision extends 1.5 inches above and below the borders of the defect.¹⁸These flaps are then approximated in the midline with a continuous non-absorbable suture. This now becomes the new midline. The rectus muscles on either side are freed from their posterior attachments to create a retro rectus space. The extent of the space is defined by the size of the original defect to be reinforced. The

polypropylene mesh is then tailor cut to the size of the retro rectus space created and fixed in the midline and laterally to ensure uniform stretching of the mesh over the newly created midline and laterally. Since there is significant dissection at this level the chances of formation of a seroma are very high. Hence a 12Fr negative suction tube is placed over the mesh and brought out through a separate incision. The rectus muscles are then medialized and approximated in the midline by a few absorbable sutures. This has an advantage that the mesh is covered to a significant extent.¹⁹ The lateral cut edges of the anterior rectus sheath from either side are then approximated in the midline with interrupted horizontal mattress sutures. A thorough saline lavage is given followed by approximation of the subcutaneous tissues. Special care should be taken to ensure that the umbilicus is fixed properly and symmetrically in its original place. Skin is usually approximated with staples. The drain was removed after 48 hours and skin staples on the tenth postoperative day. There were no seromas, pain syndromes or any surgical site infections. Patients can be discharged from hospital after drain removal. The mean follow up in the present study was 6 months. There was no recurrence. The repair described and practised in this study has sound anatomical basis. A new midline is created from the rectus sheath. This is again reinforced with a mesh. The mesh again is well protected by the closure of the flaps. So effectively there are three layers which now offer protection at the original site of the hernia. Hence the chance of recurrence is very less. This technique is safe and provides a very good success rate for umbilical hernia repair. It is also quite cost effective as compared with the laparoscopic repair.²⁰

Conclusion

We concluded that the intermediate or retro rectus mesh repair for umbilical hernia in adults is a very safe and effective way for treating umbilical hernias.

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