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Evaluation of different modalities of paraumbilical hernia repair: an experience from Al-Kindi Teaching Hospital in Baghdad

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ABSTRACT

INTRODUCTION: Paraumbilical hernia (PUH) is a common surgical condition. It is more frequent in females. Pain is the most common cause of presentation. It has many complications once left untreated. Many types of repair are reported, all have their benefits and complications.

OBJECTIVE: To evaluate the rate of development of surgical site infection, haematoma and recurrence in primary repair, Mayo's repair and onlay mesh in treatment of para-umbilical hernias

METHODS: A case series study was conducted in Al-Kindi Teaching Hospital in Al-Rasafa, Baghdad over the period from May 2011 to April 2013. Fifty-eight patients with paraumbilical hernia were enrolled in the study. They grouped into three, group 1 included those who underwent primary suturing, group 2 included those who underwent Mayo's repair, and group 3 included those who underwent onlay-mesh repair. All patients were followed up for 24 months searching for development ofsurgical site infections, haematoma and recurrence in each method of repair.

RESULTS: There were 39 females and 19 males. Age range was (20-68) years with average of (38) years. In those treated by primary suturing (18 patients), (22%) patients had surgical site infection, another 4 (22.2%) patients had haematoma, and five patients (28%) had recurrence of hernia. In patients treated by Mayo's repair (n=18 patients), 3(17%), 4(22%) and 2(11%) patients had developed surgical site infection, hematoma and recurrence respectively. Those treated by onlay mesh (n=16 patients) had infection in 3(19%), hematoma in 4(25%) and no one had developed recurrence.

CONCLUSION: There was no much difference in development of surgical site infection, and haematoma in different modality of treatment, while recurrence of hernia is much less in those traeted by onlay mesh.

Key words: : paraumbilical hernia, Mayo's repair, mesh repair, hernia recurrence, primary suture, haematoma.

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INTRODUCTION

Hernia in umbilical region is a common surgical problem and accounts for 10 % of Hernias of abdominal wall.[1] A direct or true umbilical hernia (UH) is a protrusion through the umbilical ring and is seen more commonly in neonates and infants. Indirect UH, the so called paraumbilical hernia (PUH), protrudes above or below umbilicus through a weak point in linea alba and is more commonly seen in adults.[2] The most common symptom of these hernias, whether UH or PUH, is pain at the umbilicus. Other complaints include pressure symptoms such as nausea and vomiting due to increase intra-abdominal pressure,[3] dragging pain due to weight of hernia contents, and gastrointestinal symptoms which are probably due to traction on the stomach or transverse colon. Sometimes transient attacks of intestinal colic may occur due to partial intestinal obstruction. In long-standing cases, intertrigo of the adjacent surfaces of skin and trophic ulcers of the fundus may supervene as troublesome complications.[4] Complications such as irreducibility, obstruction, strangulation and skin ulceration are more common in PUH than in other abdominal hernias.[3]

Approximately 175,000 PUHs are repaired annually in the USA.[5] It has been reported that the number of UH and PUH repairs among all re-

pairs for abdominal wall hernias increased from 5 % to 14 % in UK in the last 25 years.[6] A similar rise has been reported in a recent multicentre study from Turkey.[7]

Increasing intra-abdominal pressure is the main cause for development of PUH, so it is more common in overweight women at the age of 35-50 years. It has been reported that women are affected five times more frequent than men. Obesity and frequent pregnancy may lead to weak and flabby muscles of abdominal wall make the women more prone for PUH. Pathological factors, such as ascites and abdominal tumors may also predispose to PUH.[7]

The natural history and treatment of UH and PUH hernias do not differ. So many have regarded them as one entity.[8]

Sac in PUH has a narrow neck and may contain preperitoneal fat, omentum or bowel. Omentum is more prone for adhesions. So for these reasons PUH has a higher risk for complications like obstruction, strangulation, and irreducibility. These complications need an urgent surgical repair and increase the morbidity and mortality comparing to inguinal hernia.[9] Once detected PUH should be repaired to avoid these potentially serious complications.

The European Hernia Society Classification for primary abdominal wall hernias defines the midline hernias from 3 cm above to 3 cm below the umbilicus as UH.

Despite the high frequency of the PUH repair procedures, disappointingly high recurrence rates, up to 54% for simple suture repair, are reported.[11]

Controversy is existed about repair of PUH, whether to do primary, Mayo's, or mesh repair, either open or by laproscopy. Complications and recurrence are encountered in all of them. Primary herniorrhaphy is preferred if the defect is small while prosthetic buttressing of the abdominal wall is indicated if the defect is large.[3]

This study is designed to measure the rate of some complications; surgical site infection, development of haematoma and recurrence of hernia that occur following the three methods of surgical repair for patients with para-umbilical hernias.

METHODS

Setting of the study: A case series study was conducted at Al-Kindi Teaching Hospital, Rasafa Health Directorate in Baghdad over the period from May 2011 to April 2013. The study has included patients treated by the authors themselves.

Ethical issue: The study was approved by the scientific and ethical research committee at Al-Rasafa Health Directorate. All participants in this study were asked to sign an informed consent form according to the rules and regulations of Iraqi Ministry of Health.

Selection of the cases: All patients who have paraumbilical hernia who needed elective surgical repair and presented in the consultancy day of the authors during the studied period were included in this study. Parumbilical hernia was diagnosed clinically on the bases of presence of reducible swelling in the umbilical region showing cough impulse. In some of the cases abdominal ultrasound was used to support the diagnosis or to define the content of the hernia sac.

Inclusion and exclusion criteria: We included all patient who fulfill the diagnostic criteria of PUH and accept to do open surgical repair. The following patients have been excluded from the study:

1. Patient with recurrent hernia.
2. Pregnant women or women intended to become pregnant with 2 years after the repair.
3. Chronic debilitating illnesses like uncontrolled diabetes mellitus, chronic renal diseases, chronic liver diseases and ascites.
4. Heavy smoker and patients with chronic obstructive pulmonary diseases or any other pulmonary diseases presenting with chronic uncontrollable cough.
5. Obese patient with a BMI of more than 30.
6. History of any malignant tumours.

Outcomes measured in the study: Patients who had undergone surgical repair were followed up for 24 months postoperatively. They were examined weekly in the first month, monthly in first 6 months, and every 3 months for the rest of follow-up period. In follow-up visits patients were examined by the authors themselves searching for surgical site infection (SSI), haematoma, and recurrence of hernia.

Surgical site infection was diagnosed by the surgeons themselves through clinical examination by demonstrating redness, swelling, pain

Table 1: Complications recorded including SSI, Haematoma, and Recurrence

Group	No. of patients (%)	SSI (%)	Haematoma (%)	Recurrence (%)
Primary repair (G1)	18 (34)	4 (22)	4 (22)	5 (28)
Mayo's repair (G2)	18 (34)	3 (17)	4 (22)	2 (11)
Onlay mesh repair (G3)	16 (31)	3(19)	4 (25)	0
Total	52	10	12	7

and discharge of pus at site of operation within 5-10 days. Haematoma was also diagnosed clinically as a localised collection of bloody fluid at the site of the operation. Recurrence of hernia is diagnosed according to the same diagnostic criteria followed in the inclusion criteria.

Procedure: Patients were grouped into three groups. ***Group 1*** has included patients who has a hernia size of less than 3 cm and they were treated by primary repair with non-absorbable sutures (20 patients 35 %). ***Group 2*** has included patients with a hernia size of 3-5 cm and they are treated by Mayo's repair (22 patients 38%). ***Group 3*** has included patients with size of hernia of more than 5 cm and they were treated by onlay mesh fixed on rectus sheath by interrupted sutures (16 patients 28 %). Six patients were missed during follow-up; 2 patients from group 1 and 4 patients from group 2. These patients were excluded from the analysis of data.

Primary Repair of Hernia was made by approximation of the two edges of the defect, edge to edge, by continuous non-absorbable monofilament nylon suture number 1 suture in double layers. Mayo' s Repair of Hernia was made by overlapping the two edges of the defect on each other using interrupted stitches to fix the first edge to points in the wall of the second edge, then approximation of second edge to the wall of first edge by nylon suture number 1. In Mesh Repair we placed a non-absorbable polypropylene mesh directly on the defect, onlay repair, without approximating the defect, then fix the mesh by interrupted multiple nylon sutures rows to the rectus sheath.

Patients in all groups underwent surgery under general anaesthesia or spinal anaesthesia. Although repair of PUH is a clean surgery we use prophylactic antibiotics in three doses; the 1st dose was given within 30 minutes of induction of anaesthesia, and the other 2 doses were given after the surgery. For this purpose, we have used Ceftriaxon at dose of 1 gram by intravenous infusion. No drain was used in the first and second groups (G1 &G2); while in the third group (G3) a closed drainage (Redi vac drain) was inserted.

Therapeutic antibiotics were prescribed for those patients with SSI. Drainage or aspiration of haematoma was done was done accordingly with antibiotic cover. The antibiotic used was Ceftriaxone at dose of 1 gram every 12 hours intramuscularly for 5 days.

Statistical Analysis: Outcomes of this study were categorical we showed them by percentages and tables. We did not compare the results by statistical tests because the groups were made by severity of hernia size.

RESULTS

There were 39 (67%) females and 19 (33%) males. The age range was (20-68) years with average age of (38) years. Table 1 shows the complications in the three groups.

DISCUSSION

In adult PUH is a common surgical condition, encountered mainly in women in their 4th and 5th decades of life. In this study, Different types of surgical repairs were employed for patients including primary suture repair, Mayo's repair, and use of onlay mesh repair. Assessment of rate of development of complications like surgical site infection, haematoma at site of operation and recurrence of hernia hae been made by followup over 24 months.

The total number of patients enrolled in this study was 58 patients. Six patients were missedof followup and analysis were made on 52 patients only.

Group 1 included 18 patients, 4 patients (22%) ended with SSI, 4 patients (22%) developed haematoma and 5 (28%) patients had recurrence of the hernia. Group 2 included 18 patients; SSI

was found in 3 (17%) patients, haematoma developed in 4 (22%) patients and 2 (11%) patients had recurrence of hernia. Group 3 included 16 patients; no recurrence was recorded but 3 (19%) of them have developed SSI and 4 (25%) patients have developed haematoma.

Since suture repair was used in both group 1 and group 2, we considered them in analysis of complication as one group and were compared to group 3 where mesh repair was used. So number of patients in suture repair group (G1 and G2) will be 36 (70%) patients. SSI in this new group would be 7 (20%) patients, haematoma at site of operation would be 8 (22%), while recurrence rate would be 7 (20%).

It seems that using mesh repair decrease the possibility of recurrence. Recurrence rate with primary repair of PUH (simple repair) was reported to be 15% to 40%.[1] This is mostly due to over tension of suturing, while in mesh repair it is tension free repair filling the gap.

In a recent study, Farrow et al have done elective hernia repair on 152 patients, 19% of them have developed infection following open PUH repair, while recurrence rate was reported in 1.5% for mesh repair and 9.2% for suture repair.[12] Kolacoglu et al in a study of 100 patients with UH repaired by using mesh, he reported that 3% of the participants have developed SSI despite the use of cefazolin sodium as prophylaxis antibiotics administered 30 minutes before skin incision, and no recurrences were reported.[13]

A systematic review and meta-analysis by Aslani and Brown has showed a 10-fold decrease in the risk of recurrence with mesh repair as compared with primary repair.[1]

An increased risk of rate of recurrence of hernia is seen more in obese patients and hernia defects larger than 3 cm. Other factors that seem to be associated with increased recurrence rate are smoking and diabetes; large haematoma and SSI are classical complications that may result in recurrence.[14] Gaining weight and obesity following hernia repair are potential risk factors for recurrence.[15] Prosthetic materials are widely used today in the repair of all kinds of abdominal wall hernias. Arroyo et al in a randomized clinical trial has revealed that the recurrence rate was lower after mesh repair than after primary suture repair (1% versus 11%) after 64-month mean postoperative follow-up.[14] In the light of these results it is necessary to re-evaluate our fear to use mesh in UH and PUH repair even though not every umbilical fascia defect needs mesh repair. So mesh repair is superior to non mesh primary repair in repair of paraumbilical region hernias.

To draw a better conclusion on differences in rate of complications after using different s methods of surgical repair we need to perform a randomized controlled study on a large number of patients.

CONCLUSION

In our series, rate of recurrence is much less in patients with paraumbilical hernia who repaired by onlay mesh; however, rate of development of surgical site infection and haematoma have not shown a similar difference among different surgeical intervention.

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Abbreviation list: World health organization (**WHO**), The Diagnostic and Statistical manual of Mental Disorders, fourth Edition, text revision (**DSM-IV-TR**). Mini-mental state examination (**MMSE**). Mental state examination (**MSE**), Number (**No.**), Personal computer (**PC**), Statistical package for social science (**SPSS**), United Kingdom (**UK**), United States of America (**USA**).

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