Mesh repair of paraumbilical hernia, outcome of 58 cases

Deari Ahmed Ismaiel
University of Sulaimani, College of Medicine, Sulaimani, Iraq

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ABSTRACT

Background: According to the literature, defects in para-umbilical hernias up to 2 cm in diameter could be sutured primarily. For defects larger than 2 cm in diameters, mesh repair is recommended. The aim of this study is to evaluate the outcome of para-umbilical hernia repair with proline mesh regardless of its size.

Methods: In this retrospective study, patients with para-umbilical hernia, who were managed by onlay mesh placement were presented, and followed for 1–6 years. Several variables were studied including patients’ sociodemographic data, post-operative complications, morbidity and mortality.

Results: The series includes 58 patients, the age ranged from 18 to 85 years with median age of 44 years and inter-quartile range of 13.5 years. Mean body mass index was (30.9 ± 4.2). From 49 female patients; 43 (87.8%) were multipara. Forty seven cases (81%) presented for the first time, and 11 cases (19%) had recurrent hernias. Twenty patients (34.5%) had hernia defect ≤ 2 cm, while 38 patients (65.5%) had hernia size > 2 cm. Superficial surgical site infection was found in 6 patients (10.34%). Seroma was found in one female patient (1.72%). One patient (1.72%) had recurrent hernia after 19 months.

Conclusion: Mesh onlay repair by open surgery can be applied to all sizes of para umbilical hernias, it has low recurrence rate and the rates of morbidity and recurrence are comparable with international standard.

1. Introduction

Para-umbilical hernia (PUH) results through a defect in the linea alba. It is a common surgical problem consisting of 10% of all primary hernia [1–3]. They are more common in parous, obese, middle aged and elderly women [4]. Obesity and multiparity are important predisposing factors not only for primary, but also for recurrent cases [5,6].

The content of the hernia sac might be preperitoneal fat tissue, omentum, and small intestine in the majority; sometimes a combination of those organs may be present [7]. Pain is the most common indication to visit a physician [8]. Elective surgery is a treatment of choice due to recognized risk of obstruction, incarceration and strangulation [4].

In the past, these hernias were treated by tension free suture which resulted in a high rate of recurrence and this led to the reduction in its popularity. The use of mesh to repair the hernia defect either open or laparoscopic is widely used now a day [9,10]. A tension free mesh technique has drastically reduced the recurrence rates for all kinds of hernia compared to tissue repair [11–13].

Several factors have been implicated for recurrence after PUH repair; large seroma and surgical site infection are classical complications that may result in recurrence. Obesity and excessive weight gain following repair are other factors [6,14,15].

Size of the hernia defect interferes with the type of the operation and many surgeons still make their decisions on the basis of the size of the PUH defect, and it still a matter of controversy; a postal questionnaire study from Scotland revealed that surgeons preferred mesh repair for defects > 5 cm, whereas similar preference rates for suture and mesh repairs were obtained for defects < 2 cm [16].

The mesh can be placed via both the open and laparoscopic approaches, and some authors believe that laparoscopy is preferred in just a quarter of the cases [17,18]. Mesh can be applied onlay; on the anterior fascia, inlay; in the hernia defect, sublay; to retro-rectus or preperitoneal space or underlay; in the intra-peritoneal position [19].

Open onlay mesh placement is the easiest technique; however, it requires subcutaneous dissection that may cause seroma or haematoma and superficial surgical site infection (SSSI) in some cases [20–22], that is to be said, onlay repair has low recurrence rate, with minimum complications in case of PUH [23]. Inlay repair it is technically easier and it is also vulnerable to superficial wound complications. Sublay repair is often considered more challenging and complex to perform. Underlay repair, while it protects from superficial wound complications, the mesh is exposed to intra-peritoneal contents [24–27]. The aim of this study is to confirm the effectiveness and outcome of para-umbilical hernia repair with proline mesh regardless of its size.
2. Patients and methods

2.1. Study design and setting

A retrospective multicenter study of 58 patients, were presented with PUH of different sizes, and treated by onlay placement Synthetic polypropylene mesh, from 2010 to 2016, and followed for 19 months to 6 years. The study protocol was approved by the local ethical committee in Sulaimani medical college.

Demographic data (age, gender and residency), body mass index (BMI) were recorded. All patients were operated under general anesthesia, in supine position, with a transverse skin incision over the bulge near the umbilicus. With blunt and sharp dissection, the rectus sheath was cleared of fatty tissues and the defect containing the hernia contents was identified. The defect was opened along with sac. The sacs were separated and contents were reduced into the abdominal cavity. The hernia sacs were excised and the peritoneum was left un-sutured. A non-absorbable suture (0 or 1 Nylon or Proline) was used to close the defect in the linea alba and a proline mesh of adequate size was applied on the fascia and fixed with few non-absorbable stitches (2/0 proline). Haemostasis was secured and wound was closed over a rediave drain placed in the subcutaneous place (for 5–7 days). Incarcerated and strangulated hernias were excluded.

A prophylactic antibiotic (1 gm intravenous Cefotaxime) was used for 24 h on each patient.

Post-operative instructions were given to all patients including early wearing of an abdominal belt for two months, avoiding lifting heavy weights for four months, and not being pregnant for one year. The patients were followed every two months initially in the private clinic, for 6 months and then every six months, until 2 years, and later on by phone call annually. The work has been reported in line with the PROCESS criteria [28].

2.2. Statistical analysis

After data collection and prior to data entry and analysis, the questions of study were coded. Data entry performed on excel spreadsheet then the statistical analysis was performed by Statistical Package for the Social Sciences (SPSS) program, version 21.

The data presented in tabular form showing the frequency and relative frequency distribution of different variables of the study.

P values of 0.05 were used as a cut off point for significance of statistical tests.

3. Results

The study included 58 patients, age ranged between 18 and 85 years, with mean age of (45.1 ± 13.6) years. The peak incidence was between 18 and 44 years (51.7%). Forty nine (84.5%) cases were female and 9 (15.5%) cases were male (P value: < 0.001).

The predisposing factors, like obesity: 4 patients (6.9%) had normal BMI, 26 patients (44.8%) were overweight, 28 patients (48.3%) were obese, with mean BMI of (30.9 ± 4.2), and (P value: < 0.001).

Parity was also found to be a predisposing factor; from 49 female patients; 43 (87.8%) were multiparous and 6 (12.2%) were non-multiparous (P value: < 0.001). But there was no real factor relating to lifting of heavy weights; from 58 patients; 51 (87.9%) had usual work, and 7 (12.1%) had strenuous duties like workers and porter (Table 1).

Fortyseven cases (81%) presented for first time, and 11 cases (19%) had recurrent hernia; all of these cases had been repaired by simple sutureting or Mayop repair, without mesh. Twenty patients (34.5%) had hernia defect of ≤ 2 cm, while 38 patients (65.5%) had hernial size > 2 cm. The patients followed up for at least 2 years: 23 patients (39.7%) for up to 2 years, 22 patients (37.9%) for up to 4 years, and 13 patients (22.4%) for up to 6 years. Postoperative complications including superficial surgical site infection (SSSI) and seroma were found in 8 patients (13.79%); 7 females and 1 male, with no significant P value (0.8), regardless of the age, parity, BMI, occupation, size of the hernia and whether it was the first operation, or recurrent (Table 2). Seroma was found in one female (1.72%). One female patient (1.72%) had recurrent hernia after 19 months; she was overweight with defect > 2 cm (see Tables 3 and 4).

4. Discussion

In general, PUHs are more common in women than men [20], in our study, also female patients were more affected (84.5% and 15.5%) with P value of (< 0.001). It is believed that adipose deposition differs between genders and this contributes to gender difference in hernia formation [29].

In a study conducted by Daudpoto and associates, they found that majority of patients were above the age of 40 years [23] and in another

Table 1

| Variable          | Frequency | Percentage | P value |
|-------------------|-----------|------------|---------|
| Gender            | Male      | 9          | 15.5%   | < 0.001 |
|                   | Female    | 49         | 84.5%   |         |
| Age               | 18 - 44 years | 30       | 51.7%   | 0.2     |
|                   | 45 - 60 Years | 20       | 34.5%   |         |
|                   | > 60 years  | 8          | 13.8%   |         |
| Parity            | Multipara | 43         | 87.8%   | < 0.001 |
|                   | Non-Multipara | 6      | 12.2%   |         |
| BMI               | Normal    | 4          | 6.9%    | < 0.001 |
|                   | Overweight | 26        | 44.8%   |         |
|                   | Obese     | 28         | 48.3%   |         |
| Occupation        | Hard work | 7          | 12.1%   | < 0.001 |
|                   | Non- Hard work | 51      | 87.9%   |         |

Table 2

| Variable          | SSSI | P value | Seroma | P value |
|-------------------|------|---------|--------|---------|
| Gender            | No   | Yes     | No     | Yes     |
| Male              | 8    | 1       | 6.6%   | 9       | 0.67    |
| Female            | 44   | 5       | 48.8%  | 1       |         |
| Age               | No   | Yes     | No     | Yes     |
| 18 - 44 years     | 27   | 3       | 9.8%   | 30      | 0       | 0.38    |
| 45 - 60 Years     | 18   | 2       | 11.1%  | 19      | 1       |         |
| > 60 years        | 7    | 1       | 8.3%   | 8       | 0       |         |
| Parity            | No   | Yes     | No     | Yes     |
| Multipara         | 37   | 6       | 33.3%  | 42      | 1       | 0.71    |
| Non- Multipara    | 6    | 0       | 10%    | 6       | 0       |         |
| Obesity           | No   | Yes     | No     | Yes     |
| Normal            | 4    | 0       | 0%     | 57      | 4       | 0.54    |
| Overweight        | 24   | 2       | 8.3%   | 25      | 1       |         |
| Obese             | 24   | 4       | 16.7%  | 28      | 0       |         |
| Occupation        | No   | Yes     | No     | Yes     |
| Hard work         | 7    | 0       | 4.3%   | 45      | 5       | 0.71    |
| Non- Hard work    | 45   | 6       | 13.3%  | 50      | 0       |         |
| Size of defect    | ≤ 2 cm | 18   | 2.1%   | 54      | 20      | 0.46    |
|                   | > 2 cm | 34   | 5.8%   | 37      | 1       |         |

Table 3

| Complications     | Size of defect | P value |
|-------------------|----------------|---------|
| Wound infection   | ≤ 2 cm         | 2       | 4       | 0.95    |
|                   | > 2 cm         | 18      | 34      |         |
| Seroma            | ≤ 2 cm         | 0       | 1       | 0.46    |
|                   | > 2 cm         | 20      | 37      |         |
| Recurrence        | ≤ 2 cm         | 0       | 1       | 0.46    |
|                   | > 2 cm         | 20      | 37      |         |
study the mean age was (42.7, SD 12) [30], in this study the mean age was (45.1 ± 13.6) years and the peak incidence was between 18 and 44 years (51.7%).

Obesity and multiparity are regarded as predisposing factors [5,23,31,32], also in the current study obesity and multiparity were prevalent; (44.8%) of the patients were overweight, (48.3%) were obese, with mean MBI of (30.9 ± 4.2), and (P value: < 0.001), and from 49 female patients; 43 (87.8%) were multiparous and 6 (12.2%) were not multiparous. (P-value: < 0.001).

Although physical strain regarded as an aetiological factors in the development of PUH which raises intra-abdominal pressure, like powerful muscular effort [33], but we found that (87.9%) had usual work, and only (12.1%) had strenuous duties.

In Abdul Qayoom and his colleague study [23]; they classified the size of the hernia defects to 2–4 cm which were found in (63–78%) of the cases, and 4–6 cm which were found in (21–36%). Wassenberg et al. classified the hernia defects to small size (1–2 cm) which were found in (62.5%), and medium defects (2–4 cm) which were found in (37.5%) [34]. The hernia defects were classified using the classification proposed by the European Hernia Society, in which small hernias had diameters < 2 cm, medium size hernias had diameters between 2 and 4 cm and large hernias had diameters > 4 cm [35]. In this study we divided them to ≤2 cm as small size, which were found in (34.5%) of patients, and > 2 cm as large size and found in (65.5%) of the patients.

The use of mesh in umbilical hernia repair results in decreased recurrence and similar wound complications rates compared to tissue repair for primary umbilical hernias [9]. Onlay mesh repair by open surgery is simple, safe and effective with acceptable recurrence rate and a short learning curve [22,23,36]. Complications of this type of surgery include: wound infection, seroma and pain at the site of the operation [14,15]. These complications were found in (13.79%) in this series, regardless of the technique used, the risk of mesh infection remains a serious problem. The incidence of mesh infection in open surgery found to be relatively high (6%–10%) [37,38], because of being superficial. In the study done by Arroyo et al., rates of early complications such as seroma, haematoma or wound infection were similar in both simple suturing and mesh repair [38]. There was no mesh infection in this series, but SSSI found in six patients (10.34%), and there was no significant difference regarding different varieties, it is comparable to (11.1%) reported by Qayoom et al. (2013) [23], and somewhat similar to Rajsid dharth, Bantu, et al. study (13.3%) [40], Malik et al. (8.14%) [41], and Wassenberg (8.3%) [34]. These patients were treated with regular dressing and appropriate antibiotics, and no patient required removal of the mesh, because the infection was superficial and responded well to the treatment.

Seroma formation may complicate onlay technique. These may be explained by the fact that onlay techniques require subcutaneous dissection to place the mesh, which lead to devitalization of the tissue, and it happened in one female patient (1.72%) in this series, which nearly similar to 2.71% in Abdul Qayoom et al. (2013) [23], and less than 5% in Bessa et al. (2015) [42]. Chronic pain was not found in this series.

Clinical trials revealed that the recurrence rate was lower after mesh repair than that after suture repair (1% vs. 11%) in a 64-month mean postoperative follow-up [39]. Also in a retrospective clinical series of 100 patients, the recurrence rates for the suture and mesh repair groups were 11.5% and 0%, respectively (p = 0.007), with similar results in the infection rate in favor of mesh repair [36]. In this series, one patient had recurrent hernia after 19 months; she was overweight with defect > 2 cm, with recurrence rate of (1.72%), the rate of recurrence in this series was less to 2.7% reported by Qayoom et al (2013) [23], 3.4% rate reported by Kingsnorth et al. in UK17 shows recurrence in mesh onlay repair [43], 4.1% rate reported by Wassenberg, Dirk, et al. [34], and 10% reported by Kensarahet al (2011) [30]. There are several limitations regarding this study. First, the study design is poor regarding question has been addressed. Second, the sample size is small. Lastly, the data collection (retrospective) is a cause of missing data.

5. Conclusion

Onlay mesh repair is a simple, safe and effective. It can be applied to all size of para umbilical hernias with low recurrence rate. Morbidity, infection and recurrence are comparable international standard.

Ethical permission

A written consent was obtained from scientific and ethical committee of University of Sulaimani, number 18 at February 2, 2017.

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Author contribution

Dearei Ahmed Qasab: Surgeon performed the operation, follow up and drafting the manuscript.

Conflicts of interest

The authors declare no conflict of interest in preparing this article.

Research registration number

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Consent

Written/verbal consent was obtained from the patients or patients’ parent/carer.

Guarantor

Dearei Ahmed Qasab.
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