



Outcomes of 52 cases of surgical mesh repair for paraumbilical hernias

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ABSTRACT

Background:

The literature stated that para-umbilical hernias of less than 2cm in diameter could undergo primary suture closure. Mesh repair is preferred for defects greater than 2 cm in diameter. The objective of the study was to assess the result of para-umbilical hernia repair with proline mesh regardless of the size.

Patient and Methods:

We present a retrospective study of patients with para-umbilical hernia treated with onlay mesh placement and followed for 1–4years. Various factors including sociodemographic data of patients, post-operative complications, morbidity and mortality were examined.

Results:

The median age of the 52 patients in the series was 46 years old, with ages ranging from 23 to 77. (28.7) was the mean body mass index. Of the 44 female patients, 35 (79.5%) were multipara. Nine cases (17.3%) had recurrent hernias, while 43 cases (82.6%) presented for the first time. 35 patients (67.3%) had a hernia size > 2 cm, while 17 patients (32.6%) had a hernia defect ≤ 2 cm. Five patients (9.6%) had superficial surgical site infections. Two female patients (3.8%) had seroma. After two years, one patient (1.9%) had a recurrence hernia.

Conclusion:

All sizes of paraumbilical hernias can be repaired using mesh onlay surgery, which also has a low recurrence rate and equivalent rates of morbidity and recurrence to international standards.

1 Introduction

Para-umbilical hernias (PUHs) are surgically common and account for 10% of all primary hernias [Dabbas et al. 2011, Ellis et al. 2002, Williams et al. 2013]. They are more common in middle-aged, older, parous, and obese women [Farquharson et al. 2014], and obesity and multiparity are significant risk factors for both

primary and recurrent cases [Kulaçoğlu et al. 2015 Venclauskas et al. 2008].

The omentum, small intestine, and preperitoneal fat may make up the majority of the hernia sac's contents, though occasionally combinations of those organs may be found [Martis et al. 2011]. Most often, pain is a reason for visiting a physician (Courtney et al. 2003). The preferred course of treatment is elective surgery because of the known risks of strangulation,

incarceration, and obstruction (Farquharson et al. 2014).

In the past, tension-free sutures were used to treat these hernias, but this approach had a high recurrence rate, which made it less popular. Nowadays, mesh is frequently utilized for open or laparoscopic hernia defect repair (Jin et al. 2008, Gray Stephen et al. 2008). When compared to tissue repair, a tension-free mesh approach has significantly decreased the recurrence rates for all types of hernias (Cobb et al. 2005, Luijendijk et al. 2000, Burger et al. 2004).

Recurrence following PUH repair has been linked to several of factors; two common problems that can cause recurrence include significant seroma and surgical site infection. Other factors include obesity and significant weight gain after repair (Venclauskas et al. 2008, Nguyen et al. 2014, Berger et al. 2014).

The size of the hernia defect influences the type of operation, and many surgeons continue to base their choices on the PUH defect's size, which is still controversial. Surgeons favoured mesh repair for defects larger than 5 cm, but suture and mesh repairs for defects smaller than 2 cm were found to have identical preference rates, according to a Scotland postal questionnaire survey (Witherspoon et al. 2005).

The mesh can be inserted either openly or laparoscopically, while some authors believe that laparoscopy is only better in 25% of instances (Dalenbäck et al. 2013, Funk et al. 2013). Mesh can be put intraperitoneally (underlay), or on the retro-rectus, preperitoneal space (sublay), or on the anterior fascia (onlay), or in the hernia defect (inlay) (Holihan et al. 2016).

Open onlay mesh implantation is the simplest method, although it requires subcutaneous dissection, which can occasionally cause superficial surgical site infection (SSSI) and seroma or haemorrhage (Kulaçoğlu et al. 2012, Berger et al. 2013). To put it another way, onlay repair had minimal complications and a low recurrence incidence in PUH cases (Daudpoto et al. 2013). Despite being theoretically easier, inlay repair is susceptible to complications from superficial wounds. Many individuals think sublay repair is more complicated and challenging. Even though it guards against superficial wound complications, the mesh is exposed to intraperitoneal contents during underlay repair (Snyder et al. 2011, Losanoff et al. 2002). This study aims to validate the effectiveness of proline mesh in the treatment of para-umbilical hernias of any size

2 Materials and Methods

2.1. Study design and setting

A retrospective multicenter study involving 52 patients with PUH of varying sizes was conducted. These patients were treated with onlay placement of synthetic polypropylene mesh from 2017 to 2020 and were followed for a duration of 1 to 4 years at the surgical department of Ibn Sinaa Teaching Hospital and a private clinic in Sirte, Libya.

The body mass index (BMI) and demographic information (age, gender, and place of residence) were noted. All of the patients underwent a transverse skin incision over the bulge near to the umbilicus while they were supine and under general anesthesia. It was possible to identify the defect that contained the contents of the hernia by using blunt and sharp dissection to remove fatty tissues from the rectus sheath. The sac and defect were opened. The contents of the sacs were decreased to the abdominal cavity when they were separated. The peritoneum was not sutured, and the hernia sacs were removed. A proline mesh of sufficient size was applied to the fascia and secured with a few non-absorbable stitches (2/0 proline), and the linea alba defect was repaired with a non-absorbable suture (0 or 1 proline). haemostasis was maintained and the wound was closed Over a Romovac suction drain inserted subcutaneously (for 5–7 days). Hernias that were strangulated or Incarcerated were not included.

Each patient received a prophylactic antibiotic (1 gm intravenous Ceftriaxone) for 24 hours.

All patients received post-operative instructions, which included wearing an abdominal belt early for two months, avoiding heavy lifting for four months, and not getting pregnant for a year. The patients were monitored in the private clinic every three months for a year, and then every six months for three years.

2.2. Statistical analysis

After data collection, the study's questions were coded before data entry and analysis. Data was entered into Excel spreadsheets, and statistical analysis was conducted using version 21 of the Statistical Package for the Social Sciences (SPSS) software. The frequency and relative frequency distribution of the various study variables are displayed in the tabular data.

3 Results

52 patients, with ages ranging from 23 to 77 years and a mean age of (46) years, were included in the study. The peak incidence was between 23 and 46 years (51.9%). Eight cases (15.3%) were male, while forty-four cases (84.6%) were female. With a mean BMI of (28.7), the predisposing factors included obesity: 6 patients (11.5%) had a normal BMI, 22 patients

(42.3%) were overweight, and 24 patients (46.1%) were obese.

Additionally, parity was identified as a predisposing factor; out of 44 female patients, 35 (79.5%) were multiparous and 9 (20.41%) were not. However, no real factor was associated with lifting heavy weights; of the 52 patients, 46 (88.4%) had usual work, and 6 (11.5%) had strenuous duties as porters and workers (Table 1).

43 cases (82.6%) presented for first time, while 9 cases (17.3%) had recurrent hernia; all of these cases had been repaired with mesh-free Mayo repair or simple suturing.

35 patients (67.3%) had a hernial size > 2 cm, whereas 17 patients (32.6%) had a hernia defect of ≤ 2 cm. The patients followed up for at least one and a half years: 24 patients (46.1%) for up to one and a half years, 19 patients (36.5%) for up to 3 years, and 9 patients (17.3%) for up to 4 years. regardless of the hernia's size, age, parity, BMI, occupation, and whether it was the first operation or recurrent (Table 2). In two females, seroma was found (3.8%). After two years, one female patient (1.9%) had a recurrent hernia; she was overweight and had a defect > 2 cm (see Tables 3 and 4).

Table 1
Predisposing factors and patient demographic distribution.

Variable		Frequency	Percentage
Gender	Male	8	15.3%
	Female	44	84.6%
Age	23-46 years	27	51.9%
	47-60 years	18	34.6%
	> 60 years	7	13.4%
Parity	Multipara	35	79.5%
	Non-multipara	9	20.4%
BMI	Normal	6	11.5%
	Overweight	22	42.3%
	Obese	24	46.1%
Occupation	Hard work	6	11.5%
	Non-hard work	46	88.4%

Table 2

The distribution of seroma and superficial surgical site infections (SSSI).

Variable		SSSI		Seroma	
		No	Yes	No	Yes
Gender	Male	7	1	8	0
	Female	40	4	42	2
Age	23-46 Years	25	2	27	0
	47-60 Years	16	2	16	2
	> 60 Years	6	1	7	0
Parity	Multipara	31	4	33	2
	Non- Multipara	9	0	9	0
Obesity	Normal	6	0	6	0
	Overweight	20	2	20	2
	Obese	21	3	24	0
Occupation	Hard work	6	0	6	0
	Non- Hard work	41	5	44	2
Size of defect	≤ 2 cm	16	1	17	0
	> 2 cm	31	4	33	2

Table 3

Comparison of wound infection, seroma, and recurrence between the two groups (defect < 2 cm and ≥ 2 cm).

Complications		Size of defect	
		≤ 2 cm	> 2 cm
Wound infection	Yes	1	4
	No	16	31
Seroma	Yes	0	2
	No	17	33
Recurrence	Yes	0	1
	No	17	34

Table 4
Comparing recurrent and non-recurrent patients in terms of seroma and wound infection.

Complications		Operation	
		First time	Recurrent
Wound infection	Yes	4	1
	No	39	8
Seroma	Yes	2	0
	No	41	9
Recurrence	Yes	1	0
	No	42	9

4 Discussion

In general, the prevalence of PUHs is notably higher in females than in males (Kulaçoğlu et al. 2012); in our investigation, a similar trend was observed, with female patients constituting 84.6% of cases compared to 15.3% for males. It is posited that variations in adipose tissue distribution between genders may significantly influence the disparities observed in hernia development (Geer et al. 2009).

The mean age in the current study was 46 years, with the highest incidence occurring within the age range of 23 to 46 years (51.9%). Daudpoto and colleagues' study found that a significant percentage of patients were over 40 years old (Daudpoto et al. 2013), and another study found that the mean age was 42.7 years (SD 12) (Kensarah et al. 2011).

Multiparity and obesity are thought to be important risk factors (Daudpoto et al. 2013, Sukeik et al. 2007, Birgisson et al. 2001);

furthermore, in the present study the prevalence of obesity and multiparity was notable; (42.3%) of the patients were classified as overweight, (46.1%) were categorized as obese, with a mean Body Mass Index (BMI) of (28.7), and from 44 female patients; 35 (79.5%) were identified as multiparous while 9 (20.4%) were classified as non-multiparous.

We found that 88.4% had usual work, whereas only 11.5% performed strenuous duties, despite the fact that physical strain, such as intense muscular effort, is believed to be an aetiological factor in the development of PUH, which raises intra-abdominal pressure (Williams).

The size of the hernia defects was categorized by Abdul Qayoom and his colleague in their study (Daudpoto et al. 2013) as 2–4 cm, which was found in 63–78% of the cases, and 4–6 cm, which was found in 21–36% of the cases. Hernia defects were categorized by Wassenberg

et al. as medium size (2–4 cm), which was found in 37.5% of cases, and small size (1–2 cm), which was found in 62.5% of cases (Wassenberg et al. 2014). The hernia defects were classified according to the European Hernia Society's classification system: small hernias had diameters less than 2 cm, medium-sized hernias had diameters between 2 and 4 cm, and large hernias had diameters greater than 4 cm (Muysoms et al. 2009).

If they were less than 2 cm, they were considered small in this study (found in 32.6% of patients) and larger (found in 67.3% of patients) if they were more than 2 cm.

Mesh repair has a decreased recurrence rate and comparable rates of wound complications to tissue repair for primary umbilical hernias (Jin et al. 2008). With a short learning curve and an acceptable recurrence rate, open surgery onlay mesh repair is simple, safe, and effective (Berger et al. 2014, Daudpoto et al. 2013, Sanjay et al. 2005). Complications of this type of surgery include seroma, wound infection, and pain at the operative site (Nguyen et al. 2014, Berger et al. 2014).

Mesh infection is still a major issue regardless of the method employed. Because open surgery is superficial, the frequency of mesh infection has been reported to be relatively high (6%–10%) (Cobb et al. 2009, Petersen et al. 2001). Mesh repair and simple suturing had comparable rates of early problems, such as seroma, bleeding, or wound infection, according to the Arroyo et al. study (Petersen et al. 2001). Five patients (9.6%) developed SSSI, but in this series, there was no mesh infection, and the variations did not differ significantly. This is relatively similar to the Rajsid Dharth, Bantu, et al. study (13.33%) (Bantu et al. 2015), Malik et al. (8.14%) (Malik et al. 2008), and Wassenberg (8.3%) (Wassenberg et al. 2014), and it is comparable to the (11.11%) reported by Qayoom et al. (2013) (Daudpoto et al. 2013).

due to the fact that the infection was just superficial and that the treatment was effective, none of these patients needed the mesh to be removed; instead, they were treated with appropriate antibiotics and frequent dressing changes.

Onlay technique may be complicated by seroma development. Two female patients (3.8%) in this series experienced this, which is comparable to 2.71% in Abdul Qayoom et al. (2013) (Daudpoto et al. 2013) and less than 5% in Bessa et al. (2015) (Bessa). These could be explained by the fact that onlay procedures necessitate subcutaneous dissection in order to insert the mesh, which lead to devitalization of the tissue. Chronic pain was not covered in this series. In a 64-month mean postoperative follow-up, clinical studies showed that the recurrence rate following mesh repair was lower than that following suture repair (1% vs.

11%) (Arroyo et al. 2001). The mesh repair group experienced a 0% and 11.5% recurrence rate, respectively, in a retrospective clinical research including 100 patients. The infection rate was similar in favor of mesh repair (Sanjay et al. 2005). One patient in this series experienced a recurrent hernia after two years; she was overweight and had a defect larger than 2 cm, with a 1.9% recurrence rate.

Qayoomet al. (2013) (Daudpoto et al. 2013) reported a recurrence rate less to 2.7%, Kingsnorth et al. in the UK reported a rate of 3.4% (Kingsnorth et al. 2008), Wassenberg, Dirk, et al. (Wassenberg et al. 2014) reported a rate of 4.1%, Kensarahet al. (2011) (Kensarah et al. 2011) reported a rate of 10%, Ismaeil Deari al. (2018) (Deari et al. 2018) reported a rate of 1.72%. This study has a number of limitations. First, the study's design is inadequate in terms of how the questions are answered. Secondly, there is a small sample size. Lastly, the retrospective nature of data collecting contributes to missing data.

5 Conclusions

Onlay mesh repair is easy, secure, and efficient. It has a low recurrence rate and can be used on paraumbilical hernias of any size. International standards for infection, recurrence, and morbidity are similar.

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Conflict of interest: The authors declare that there are no conflicts of interest

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