ORIGINAL ARTICLE

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Intraperitoneal Ventralex™ ST Hernia Patch Application for Ventral Hernia Repair

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Abstract

Objective: Traditional methods commonly used in ventral hernia repair have a high recurrence rate. In patch repair, the recurrence rate is low, but there are many prosthetic materials. Ventralex™ ST hernia patch has small and medium sizes. We aimed to determine the results in ventral hernias.

Methods: A single-center retrospective analysis was performed. Ventral hernias <3 cm were repaired using intraperitoneal Ventralex™ ST hernia patch between January 2015 and March 2017. Demographic characteristics, operative time, analgesic requirement, length of hospital stay, postoperative complications, and recurrences were recorded.

Results: A total of 65 patients with umbilical, epigastric, and trocar site hernia underwent surgery. Thirty-four patients were female, and 31 were male. According to the localization, 43 patients had an umbilical hernia, 16 had an epigastric hernia, and six had trocar site hernia. Hernia size was <2 cm in 35 patients and 2-3 cm in 30 patients. The mean body mass index was 28 kg/m^2. Wound infection was detected in two patients, and one patient had seroma. The mean follow-up was 17 months. No recurrence was observed during follow-up.

Conclusion: Ventralex™ ST hernia patch is a safe prosthetic material that can be applied by open surgical technique with low complication and recurrence rates, especially in small and medium-sized umbilical, epigastric and trocar site hernias.

Keywords: Ventral hernia, umbilical hernia, Ventralex™ hernia patch

INTRODUCTION

The European Hernia Society classifies primary abdominal wall hernias (ventral hernias) by localization and size. Epigastric and umbilical hernias were classified as "midline hernias" and spighelian and lumbar hernias were classified as "lateral hernias". According to hernia size, they classified hernias into three groups as small (<2 cm), medium (≥2-4 cm), and large (≥4 cm) (1). These hernias are most commonly seen in the umbilical region, according to localization (2). Although most do not have any symptoms, umbilical hernias are often symptomatic and require surgical repair due to the risk of incarceration (3,4). Different techniques have been described in surgical repair. The first is the technique of approaching the fascias with interrupted sutures. The second and most commonly used technique is the closure of the fascia in a "double-breasted" fashion (5). Recurrence of 25-55% has been reported in both conventional methods (6-7). However, especially in small hernias, these methods are still preferred (5). In patch repair techniques (hernioplasty), prosthetic materials are placed with or without sutures in the defect area. These materials are placed on the fascia, retromuscular pre-facial area, or pre-peritoneal area (8). Hernia recurrence is reduced to 1% in hernioplasty techniques (7). Ventralex™ ST (C.R.Bard, RI, USA) is a patch placed intraperitoneally by the open surgical method. In the literature, it was reported that this patch was used safely in small and medium-sized abdominal wall hernias, and the recurrence rates were low (0-1%) (9). In this study, early results, complications, and recurrences of Ventralex™ ST hernia patch in small and medium abdominal wall hernias were discussed in the light of the literature.

METHODS

Sixty-five patients with small and medium abdominal wall hernias underwent surgery between January 2015 and March 2017 (Figure 1). Patients under 18 years of age, patients with

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a hernia diameter greater than 4 cm, and American Society of Anesthesiologists (ASA) IV patients were excluded from the study. Age and gender characteristics, operative time, body mass index (BMI), postoperative analgesic use, length of hospital stay, postoperative complications, and recurrences were recorded. The study was initiated after approval by the ethics committee of our hospital. All patients in the study were informed by written and verbal explanations, and informed consent forms were obtained. All patients were operated under general anesthesia by two specialists working in the same clinic. Three patients underwent simultaneous laparoscopic cholecystectomy, and one patient underwent inguinal hernia surgery. Ventralex™ ST hernia patches of different sizes (diameter: 4.3 cm-6.4 cm) composed of polypropylene mesh with hydrogel barrier reinforced with double-sided bio-resorbable polyglactin fibers were used as hernia patch.

Surgical Technique

After induction of anesthesia, all patients received prophylaxis with a single dose of intravenous antibiotics (1 g Cefazolin sodium). The hernia sac was reached by transverse skin incision over the hernia, and the sac was exposed (Figure 2). The hernia sac was opened, and the hernia contents were pushed into the abdomen. The diameter of the defect was measured to use the appropriately sized patch. The hernia patch was applied to extend at least 2-2.5 cm in all directions from the intact edges of the defect. The hydrogel barrier-coated side of the patch was placed facing the abdomen. The polypropylene side of the patch was applied facing the anterior wall of the abdomen. Intervening tissues were prevented by pulling up the patch with the help of long strips on the edge of the patch (Figure 3, 4). Each of the hanging strips was sutured to the intact fascia with two 2/0 prolene sutures. The fascia was closed primarily. The surgery was terminated with subcutaneous and skin suturing (Figure 5). Drainage was not applied to any patient. The patients who were discharged were given oral analgesic (paracetamol tablet) treatment for seven days. All patients were called to the outpatient control one week and three weeks after the operation.

Statistical Analysis

Descriptive statistics were used to calculate percentages for categorical variables and mean and standard deviation values for continuous variables. All analyses were performed using the SPSS version 16.0 statistical software package (SPSS Inc., Chicago, IL, USA).

RESULTS

Thirty-four patients were female (52.3%), and 31 were male (47.7%). The mean age was 44.5 years (range=28-74). Of the 65 patients, 43 had an umbilical hernia (66.15%), 16 had an epigastric hernia (24.61%), and six had trocar site hernia (9.23%). Forty-four patients had a BMI of >30 kg/m^2 and 21 patients had a BMI of <30 kg/m^2 (Table 1). The size of the hernia was <2 cm in 35

Figure 1. <3 cm umbilical hernia case

Figure 2. Dissection of the peritoneal sac

Figure 3. Opening the hernia sac and sending the patch to the intraperitoneal area

Figure 4. Pulling the patch up from the hangers on both sides

patients and between 2-3 cm in 30 patients. Ventralex™ ST patch was applied in small size (4.3x4.3 cm) in 24 patients and medium size (6.4x6.4 cm) in 41 patients (Table 2). Thirty-five patients had ASA score I, 11 had ASA score II, and 19 had ASA score III. The mean operative time was 37.67 minutes (range=23-67), and the mean hospitalization time was 1.1 days (range=1-4). Four patients were hospitalized for three days for pain control. None of the patients needed narcotic analgesics. The mean follow-up period of the patients was 17.23 months (range=6-30), and no recurrence was observed during the follow-up. Two patients (3.07%) developed a subcutaneous infection during follow-up. These patients received symptomatic treatment (Table 3).

DISCUSSION

The surgical method to be used in umbilical hernias according to defect diameter, which are the most common primary abdominal wall hernias, is controversial. Most surgeons recommend surgery for the treatment of these hernias, even if the defect diameter is small, because of the risk of incarceration and strangulation (10). High recurrence rates (25-55%) have been reported in simple suture techniques, and the Mayo technique (non-patched treatment methods) (11). In a randomized prospective study by Arroya et al. (7), the recurrence rate was reported as 1% when a patch was used in umbilical hernia repair and 11% when suture alone was used, and it was concluded that patch should be used primarily in umbilical hernia repair. In another study with a mean follow-up of 64 months in patients treated with simple sutures, hernia recurrence was reported as 54.5%

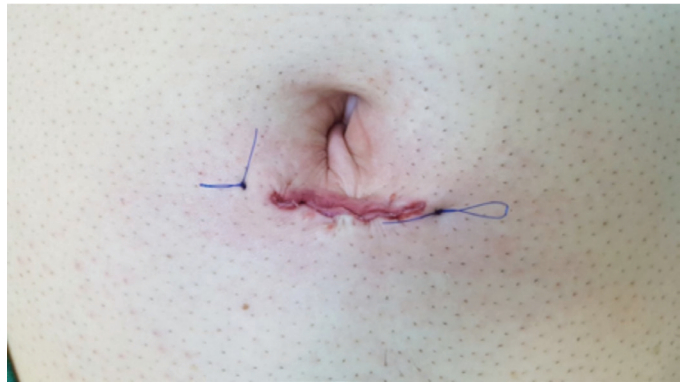

Figure 5. Completed repair

Table 1. Patient characteristics	
Variable	**n**
Total number of patients	65
Female/male	34/31
Mean age (years)	44.5 (28-74)
Mean body mass index (kg/m^2)	32 (18-68)

Table 2. Perioperative data in Ventralex™ ST patch repair		
Variables	**%**	**n**
Hernia size (cm)		
<2 cm	53.84%	35
2-3 cm	46.16%	30
Hernia type		
Umbilical hernia	66.15%	43
Epigastric hernia	24.61%	16
Trocar site hernia	9.23%	6
Ventralex™ ST size		
Small (4.3x4.3 cm)	36.93%	24
Medium (6.4x6.4 cm)	63.07%	41

Table 3. Ventralex™ ST patch repair results		
Variables	**%**	**n**
Complications	-	-
Recurrence	0	0
Seroma	1.53	1
Wound infection	3.07	2
Follow-up period (months)	-	17.23 (minimum-maximum 6-30)

(12). Such high recurrence rates have led to a shift from simple suture techniques to patch repair techniques. Although there is no objective data between umbilical hernia size and treatment, patch repair is recommended, especially in high-risk and obese patients if the defect diameter is >3 cm (3,13). The real question here is what should be the treatment for hernia smaller than 3 cm. The high risk of incarceration and strangulation in this type of hernia has led to the preference of patch repair (7,14,15). In a study of 100 patients with ventral/umbilical hernia smaller than 3 cm in which Wang and Berney (16) applied a Ventralex™ patch, no recurrence was observed during a mean follow-up of 37.9 months. Also, no recurrence was observed in a study by Martin et al. (17), including 88 cases. In our study, no recurrence was observed during the 17-month follow-up period. On the other hand, Berrevoet et al. (18) reported recurrence in five cases treated with intraperitoneal patch and two cases treated with retromuscular patch among 116 patients with umbilical hernia less than 3 cm that were operated with the open method. In a study by Tollens et al. (19) the recurrence rate was reported to be 8.9% at 135 months of follow-up in 135 patients treated with Ventralex™ for ventral hernia. This high recurrence rate was attributed to technical application and differences in the fixation of the polypropylene side to the fascia. In this study of Tollens, it was also observed that all patients had a uniform medium size (6.4x6.4 cm) patch. In our opinion, another reason for high recurrence was the use of a uniform patch regardless of the defect diameter. It has been reported in the literature that the patch to be applied should extend at least ≥2.5 cm from the edges of the defect (18). In our study, this situation was taken into consideration, and appropriate size patches were used by measuring the diameter of the defect. When we look at the complications in the literature, we encounter different types of complications as in recurrences. Complication rates vary between 2-11.8%, and the most common complications are local infections, seroma, and hematoma (20,21). In our study, superficial wound infection was observed in two cases, and seroma was observed in one case. Both cases were controlled with conservative follow-up and antibiotics.

CONCLUSION

In this study, it was concluded that the Ventralex™ ST patch, which can be applied quickly and easily with open surgery method in small and medium-sized abdominal wall hernias, could be used safely due to low complication and recurrence rates. Also, long-term randomized controlled trials with different patches are thought to contribute more to the literature.

Ethics

Ethics Committee Approval: Retrospective study

Informed Consent: This is a retrospective study. Patient data were taken from the files.

Peer-review: External and internal peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: B.A., Y.İ., Concept: B.A., Design: B.A., Data Collection or Processing: Y.İ., Analysis or Interpretation: B.A., Literature Search: Y.İ., Writing: B.A.

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