INTRODUCTION
Abdominal wall hernias are a common challenge for all surgeons. Repair of the ventral hernia remains a common operation performed by general surgeons now a days.\(^1\) The incidence of ventral hernia ranges from 10 to 50%.\(^2\) A number of risk factors are said to be responsible for ventral hernia formation which include previous surgery, radiation therapy, collagen disorders and syndrome of metastatic emphysema.\(^3\)

Repair of the ventral hernia is required to relieve the symptoms, and to prevent incarceration.\(^5\) The surgeons continue to debate about the ways in which to repair these abdominal wall defects. Minimally invasive techniques have changed the approach to ventral hernia repair with low infection rate, less postoperative pain, and lower rate of recurrence.\(^4\)

The laparoscopic ventral hernia repair has significant reduction in wound complications and mesh infection.\(^6\) This approach is also associated with shorter hospital stay, faster time of recovery and lower rate of recurrence, compared to open hernia repair, as described in literature.\(^9\)

The purpose of this study was to determine the outcome of patients after laparoscopic ventral hernia repair, in terms of wound complications, including haematoma and wound infection, and follow-up in terms of suture site pain and recurrence of hernia.

METHODOLOGY
This was an observational study, and data was collected retrospectively in Dubai Hospital, Dubai, United Arab Emirates. All adult patients who underwent laparoscopic ventral hernia repair from January 2007 to June 2011 were included in the study. The patients who could not afford to pay for proceed mesh, and underwent open hernia repair, were excluded. All patients received prophylactic antibiotics at the time of surgery. Standard operative technique was used for the repair of hernia. A dual proceed mesh was used for the repair of the hernia which overlap the defect about 4 – 5 cm. The size of the mesh was selected according to the size of the defect. The mesh was secured to the abdominal wall by transfixating sutures and additional tacks were applied at 1 cm distance. The follow-up of these patients was completed till December 2011.
Multiple parameters were studied, including demographic features, presentations, co-morbid conditions, duration of hernia, and defect size. The duration of surgery, postoperative complications, and follow-up of these patients in terms of suture site pain and recurrence of hernia were also analyzed.

The data was expressed as frequency, percentages and mean ± standard deviation. Statistical Package for Social Sciences (SPSS) version 17 was used for data analysis.

RESULTS

A total of 27 patients were included in the study. The mean age of the patients was 47 ± 10.3 years (ranging from 30 to 69 years). There were 20 female (74.07%) and 7 male patients (25.93%). The mean duration of symptoms was 10 ± 11 months (ranging from 2 to 48 months). All 27 patients (100%) had swelling in abdominal wall at the time of presentation, out of which 19 patients (70.37%) had pain as well. Primary hernia was present in 23 patients (85.18%), while 4 patients (14.81%) had recurrent hernia. The hernia was partially reducible in 12 patients (44.44%), and completely reducible in 15 patients (55.55%) (Table I). Seven patients (25.95%) had hypertension, 3 (11.11%) had diabetes, and 4 patients (14.81%) each had obesity and as ischaemic heart disease a co-morbid conditions.

The mean size of the defect was 6 ± 1.3 cm ranging from 3.5 to 10 cm. The mean duration of the surgery was 94 ± 32 minutes ranging from 60 to 150 minutes. Operative time in one patient was 150 minutes, as this patient had recurrent hernia with adhesions of the bowel and omentum to abdominal wall. Mean duration of hospital stay was 4 ± 1.0 days ranging 3 – 6 days.

Postoperative complications included seroma in 3 patients (11.11%) and haematoma at the site of hernia in one patient (3.70%). All these patients were treated conservatively and improved. The mean follow-up duration was 23 ± 10.7 months ranging from 5 to 54 months. There was no recurrence of hernia or wound infection in this group of patients. Four patients (14.81%) had pain at suture site (Table II). These patients were treated with analgesics and improved.

DISCUSSION

Ventral hernia is a common surgical problem, with an annual incidence of 10 – 50%. This incidence may increase due to the large number of laparotomies performed annually. Minimally invasive techniques have changed the approach to ventral hernia repair with favourable results, as compared to open hernia repair.

Laparoscopic approach has the advantage of having low infection rate, less postoperative pain, and lower rate of recurrence. The identification of swiss cheese defects is another advantage of laparoscopic repair, which can be missed in open repair.

Based on the Pascal’s principle and the law of Laplace, a ventral hernia will continue to enlarge with time. As the hernia enlarges, the wall thins even more, and diameter increases. This enlarges the hernia further. The incidence of incarceration in untreated ventral hernia is about 10%, out of which 50% will get strangulated and 20% will require bowel resection. Therefore, ventral hernia requires early surgical repair after diagnosis.

In this study, there were more female patients, as compared to male, which is the same as described in literature, however, the mean age of the patients in this series is less as compared to the study by Kannan. The different risk factors for the development of ventral hernia as described in literature are previous surgery, chronic airway disease, obesity, collagen disorders, and radiation therapy. Four patients (14.81%) had obesity as a risk factor in this series.

The mean operative time in this series was 94 minutes, which is comparable to the time described in other studies. However, in one patient it took 150 minutes to complete the procedure. This was a recurrent incisional hernia, with adhesions of the bowel and omentum to abdominal wall, and releasing the adhesion took a longer time. There was no conversion to open surgery in this series. All the cases were managed by laparoscopic approach. The mean duration of hospital stay was 4 days in these patients. This duration is comparable to other series as described in literature.

The incidence of bowel injury is upto 9% as described in literature. There was no bowel injury in our series. Postoperative complications included seroma in 3 patients (11.11%) and haematoma in one patient (3.70%). The haematoma was small at the site of the hernia, this was treated conservatively and improved. The seroma in all 3 patients resolved without aspiration. This treatment of seroma was according to the guidelines for hernia repair, which recommend, “don’t aspirate seroma”.

Table I: Presentation of patients.

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Number of patients</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Swelling in abdominal wall</td>
<td>27</td>
<td>100%</td>
</tr>
<tr>
<td>Pain in swelling</td>
<td>19</td>
<td>70.37%</td>
</tr>
<tr>
<td>Primary hernia</td>
<td>23</td>
<td>85.18%</td>
</tr>
<tr>
<td>Recurrent hernia</td>
<td>04</td>
<td>14.81%</td>
</tr>
<tr>
<td>Swelling partially reducible</td>
<td>12</td>
<td>44.44%</td>
</tr>
<tr>
<td>Swelling completely reducible</td>
<td>15</td>
<td>55.55%</td>
</tr>
</tbody>
</table>

Table II: Complications and outcome after surgery.

<table>
<thead>
<tr>
<th>Complications and outcome</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound seroma</td>
<td>3</td>
<td>11.11%</td>
</tr>
<tr>
<td>Wound haematoma</td>
<td>1</td>
<td>3.70%</td>
</tr>
<tr>
<td>Suture site pain</td>
<td>4</td>
<td>14.81%</td>
</tr>
<tr>
<td>Recurrence of hernia</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
A meta analysis of five randomized studies showed less wound complications in laparoscopic hernia repair as compared to open repair. Another study showed patients with large hernias to benefit more from the laparoscopic approach.

The mean follow-up in this series was 23 ± 10.7 months. There was no recurrence of hernia in this series of patients. The incidence of recurrence is upto 12% as described in literature. A prospective randomized study comparing laparoscopic and open hernia repair, showed reduced rate of recurrence of hernia in laparoscopic approach.

The recurrence may be attributed to the stretch of the mesh by the biomechanics of the abdominal wall. The shrinkage of the mesh is another factor for recurrence. Fixation of the mesh with sutures and tacks is associated with less mesh shrinkage, as compared to fixation with tacks alone.

Four patients had pain at suture site. These patients responded well to analgesics, and they did not require removal of fixating sutures. The incidence of suture site pain is upto 3%, which can be due to the nerve entrapment or muscular compression by sutures. The treatment include a multidisciplinary approach, including analgesics, infiltration of local anaesthesia, physiotherapy, and removal of fixating sutures.

CONCLUSION

Laparoscopic repair is an appropriate approach for ventral hernia repair. This is associated with good quality repair and low wound complications in terms of haematoma and wound infection. There was no recurrence of hernia in this study.

REFERENCES