"EARLY POSTOPERATIVE COMPLICATIONS OF MESH REPAIR OF INGUINAL HERNIA BY LICHTENSTEIN TENSION-FREE REPAIR"

BAKHT SARWAR¹, MOHAMMAD AMIN¹
1. District Headquarters Hospital, Timergara, District Lower Dir, Khyber Pakhtunkhwa

ABSTRACT

BACKGROUND: To find out the early postoperative complications of mesh repair of inguinal hernia by Lichtenstein tension free repair.

METHODOLOGY: This descriptive study was done in Surgical Unit of District Headquarters Hospital, Timergara, Dir Lower, for 1 year, from 01-01-2013 to 31-12-2013. A total of 100 cases of inguinal hernia, male, age 20 years and above, all inguinal hernias (direct and indirect) and recurrent hernias were included in the study in which mesh repair was performed. Females and complicated hernias (strangulated/obstructed) cases were excluded from the study. Included cases were followed up in the ward and at 2 weeks and 1st month postoperatively for any complications.

RESULTS: Majority 23% cases were in the age range of 51-60 years. The right sided hernia found in 62% cases, in 55% cases indirect inguinal hernia and in majority 97% cases primary inguinal hernia was recorded. Postoperatively at 2 weeks follow up wound hematoma was found in 10% cases, seroma in 09%, wound infection in 02%, pain in 12%, urinary retention in 06%, and scrotal swelling in 04% cases. Postoperatively at 1st month follow up wound hematoma was found in 06% cases, seroma in 04%, wound infection in 01%, pain in 07%, urinary retention in 03%, and scrotal swelling in 01% cases.

CONCLUSIONS: In majority of cases right sided, indirect, primary inguinal hernia has been recorded. Older age males and patients with poor and unhygienic conditions were more affected with this disease.

KEY WORDS: Inguinal hernia-primary; recurrent, mesh hernioplasty, postoperative pain, wound infection, hematoma, seroma.

INTRODUCTION:
A hernia is a protrusion of a viscus or part of a viscus through an opening in the walls of its containing cavity.¹

Hernia constitutes 10-15% of all surgical procedures, 80% being inguinal and 92% are in men.² Inguinal hernias are common throughout the world. These account for 75% for all forms of hernias and more commons in males than females in ratio of 20:1.³

It is more likely to occur in men than in women because the spermatic cord passes through the abdominal wall in the inguinal region leaving a site of natural weakness prone to hernia formation.⁴ Although the disease is associated with considerable morbidity, mortality is rare, except in remote areas where delay in treatment can lead to strangulation and death. Several factors account for frequency of this disease that are upright position, occupational factors and conditions such as persistent cough or constipation, that increases intra abdominal pressure.⁵

Traditionally the inguinal hernia repair is performed through an incision in the groin. Different kinds of operations are performed as repair by using the patient’s own tissue, or use of prosthetic mesh to reinforce the abdominal wall.⁶ Different types of repairs are Darning, Shouldice, Bassini and Lichtenstein tension free repair. Lichtenstein tension free repair of inguinal hernia is a simple, easier to learn with no significant early and late morbidity.⁷ The use
of polypropylene mesh in Lichtenstein repair is standard and safe but as every surgery has complications, it has some early and late complications. Mesh associated complications like postoperative wound infection, hematoma, seroma, urinary retention, testicular complications/hydrocele, postoperative pain and general complications like urinary tract infection, chest infections, deep vein thrombosis. The mesh repair has comparable results in return to work, return to daily activities, complications, postoperative pain and quality of life.

Various repair procedures fall into two categories. Fascial repair, tension free prosthetic repair and open preperitoneal mesh repair for recurrent inguinal hernia is a safe procedure.

In recent years, use of prosthetic materials for inguinal hernia repairs has increased dramatically. Tension free repairs have gained popularity not only for recurrent or complicated hernia but for primary hernia repair as well. Inguinal hernia repair with mesh is one of the most common procedures in general surgery and antibiotic consumption for preventive purposes is becoming a serious problem due to the risk of contribution to development of bacterial resistance and the significant increase in healthcare costs.

Polypropylene mesh is the most widely used material in inguinal hernia repair. It is the preferred prosthetic material for the tension-free hernioplasties because it handle well and become quickly incorporated, having reduced the recurrence rate below 1%. Tension-free repair (with prosthetic mesh) involves the use of synthetic prosthetic materials for rebuilding the posterior inguinal wall. Tension-free repair reduces the recurrence rate, improves postoperative recovery, and lowers cost, it has become the gold standard procedure for repairing inguinal hernias.

Men presenting with inguinal hernia often have minimal symptoms, if any. Although elective surgery is often recommended to prevent complications, it carries the risk of hernia recurrence, pain and discomfort as well as the risks associated with anesthesia and surgery, such as hematoma and infection.

It is a fact that there is high rate of postoperative complications in our setup so it was the rationale of the study to know about these early complications in mesh repair for inguinal hernia so that they can be treated as early as possible to comfort the patients and avoid these complications in the future cases.

METHODOLOGY
This study was performed at surgical ward of District Headquarters Hospital, Timergara, Dir Lower, for one year, from 01-01-2013 to 31-12-2013. A total of 100 cases of inguinal hernia, male, age 20 years and above, all inguinal hernias (direct and indirect) and recurrent hernias were included in the study in whom mesh repair was performed. Females and complicated hernias (strangulated/obstructed) cases were excluded from the study.

All patients with inguinal hernia presenting to out-patient department, were admitted in the surgical ward of District Headquarters Hospital, Timergara, Dir Lower. All patients with inguinal hernias keeping in mind the inclusion and exclusion criteria, after taking informed consent from patients or their relatives, were undergone thorough physical and clinical examination, detail history of illness, site of hernia, duration and type of hernia (on examination), routine investigations like; blood urea, blood sugar, full blood count, urine routine examination, hepatitis screening (HBsAg, HCV Anti-bodies), X-ray chest and electrocardiogram were performed in all patient. Patients were kept empty stomach after 12:00 midnight and were operated on next day elective surgery list. Antibiotics (Amoxicillin/clavulanic acid) were given at the time of induction of anesthesia, 08 hours and 16 hours post operatively. Postoperatively patients were kept nil per oral till full recovery from
anesthesia, analgesics (tramadol injectable) 12 hourly for first 24 hours, intravenous fluids till orally allowed. During the operation site, type of hernia and other information were noted. After the operation, all these patients were followed up in the ward and on follow up visits for any postoperative complication such as wound infection, hematoma, seroma, and pain. Patients were discharged on 1st postoperative day on oral antibiotics, analgesics and instructions for follow up on 02nd week and 01 month.

After discharge from hospital these patients were advised to come to out-patient department if any complication seen at operation site. All these patients were regularly followed up in the Outpatient Department on 02nd week and 01 month after operations for early complications of mesh repair of inguinal hernia, as early postoperative complications may be seen in the 1st month of operation.

All these information regarding the early postoperative complications and other demographic features like, name, age, address, were also recorded in a proforma specially designed for this purpose.

All the studied variables like type of hernia, site of hernia, postoperative complications like; wound infection, hematoma, seroma, pain, were analyzed for descriptive statistics. Frequencies, percentages were calculated for all these variables and all these data was presented in graphs and tables. Mean and ± standard deviation was calculated for age. All the data analysis was done by computer program SPSS version 12 for windows.

RESULTS:
A total of 100 male patients with primary and recurrent inguinal hernias were subjected to hernia repair with prolene mesh in this study.
In this study the age of the patients was ranged from 20-80 years with mean age of 48.11 ± S.D 16.47 years. Majority of patients, 23 (23%) were in the age range of 51-60 years.

The right side hernia was found in majority 62 (62%) cases and in 38 (38%) cases left side hernia was found. In majority, 55 (55%) cases indirect inguinal hernia and in 45 (45%) cases direct inguinal hernia had found. Primary inguinal hernia had been reported in majority 97 (97%) cases and recurrent hernia was reported in 03 (03%) cases (Table No. 1).

TABLE NO. 1: VARIOUS DEMOGRAPHIC FEATURES OF PATIENTS (n=100)

<table>
<thead>
<tr>
<th>AGE RANGES</th>
<th>NO. OF CASES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ranges:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 years</td>
<td>04</td>
<td>04%</td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>19</td>
<td>19%</td>
</tr>
<tr>
<td>31 – 40 years</td>
<td>11</td>
<td>11%</td>
</tr>
<tr>
<td>41 – 50 years</td>
<td>22</td>
<td>22%</td>
</tr>
<tr>
<td>51 – 60 years</td>
<td>23</td>
<td>23%</td>
</tr>
<tr>
<td>61 – 70 years</td>
<td>18</td>
<td>18%</td>
</tr>
<tr>
<td>71 – 80 years</td>
<td>03</td>
<td>03%</td>
</tr>
<tr>
<td>Side of hernia:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right side hernia</td>
<td>62</td>
<td>62%</td>
</tr>
<tr>
<td>Left side hernia</td>
<td>38</td>
<td>38%</td>
</tr>
<tr>
<td>Type of hernia:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect</td>
<td>55</td>
<td>55%</td>
</tr>
<tr>
<td>Direct</td>
<td>45</td>
<td>45%</td>
</tr>
<tr>
<td>Kind of hernia:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>97</td>
<td>97%</td>
</tr>
<tr>
<td>Recurrent</td>
<td>03</td>
<td>03%</td>
</tr>
<tr>
<td>POSTOPERATIVE COMPLICATIONS</td>
<td>NO. OF CASES</td>
<td>PERCENTAGE</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>Early:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postoperative pain</td>
<td>12</td>
<td>12%</td>
</tr>
<tr>
<td>Wound hematoma</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>Seroma</td>
<td>09</td>
<td>09%</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>06</td>
<td>06%</td>
</tr>
<tr>
<td>Scrotal swelling</td>
<td>03</td>
<td>03%</td>
</tr>
<tr>
<td>Wound discharge</td>
<td>02</td>
<td>02%</td>
</tr>
<tr>
<td>General complications:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>04</td>
<td>04%</td>
</tr>
<tr>
<td>Chest infection</td>
<td>02</td>
<td>02%</td>
</tr>
<tr>
<td>Deep venous thrombosis</td>
<td>01</td>
<td>01%</td>
</tr>
</tbody>
</table>

Among the early postoperative complications at 1st month follow up, wound hematoma was found in 06% cases, seroma in 04%, wound discharge in 01% case, early postoperative pain in 07%, urinary retention in 03%, and scrotal swelling was recoded in 01% case.

Among the general complications at 1st month follow up, chest infection was observed in 01% case and urinary tract infection in 01% case (Table No. 3).

TABLE NO. 3:
POSTOPERATIVE COMPLICATIONS AT 1ST MONTH FOLLOW UP IN PATIENTS (N=100)

<table>
<thead>
<tr>
<th>POSTOPERATIVE COMPLICATIONS</th>
<th>NO. OF CASES</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postoperative pain</td>
<td>07</td>
<td>07%</td>
</tr>
<tr>
<td>Wound hematoma</td>
<td>06</td>
<td>06%</td>
</tr>
<tr>
<td>Seroma</td>
<td>04</td>
<td>04%</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>03</td>
<td>03%</td>
</tr>
<tr>
<td>Scrotal swelling</td>
<td>01</td>
<td>01%</td>
</tr>
<tr>
<td>Wound discharge</td>
<td>01</td>
<td>01%</td>
</tr>
</tbody>
</table>

General complications:

<table>
<thead>
<tr>
<th></th>
<th>01</th>
<th>01%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chest infection</td>
<td>01</td>
<td>01%</td>
</tr>
</tbody>
</table>

DISCUSSION:
The Lichtenstein anterior tension free mesh repair is widely regarded as the gold-standard hernia operation. It is easy to learn, reproducible and carries a low complication rate.\(^{20}\)

Inguinal hernia repair is one of the most commonly performed surgical procedures. Although the disease is associated with considerable morbidity, mortality is rare, except in remote areas, where delay in treatment can lead to strangulation and death.\(^5\)

The repair of abdominal wall defects in potentially contaminated or grossly infected fields presents a difficult clinical problem. Polypropylene mesh is relatively contraindicated in these settings because of the potential for chronic infection.\(^{21}\)

Inguinal hernia is more likely to occur in men than in women because the spermatic cord passes through the abdominal wall in the inguinocele, leaving a site of natural weakness prone to hernia formation.\(^4\) Results of a local study conducted at Lady Reading Hospital, Peshawar, also selected male patients.\(^{22}\) Therefore, in this study we have selected 100% males who were operated for inguinal hernia.

Old age can not be considered as an absolute risk factor in the surgical treatment of inguinal hernia, which can also be stated for the majority of elderly people pathologies. The modern tension-free techniques have demonstrated in cardiopath patients the same advantages which have observed in elderly non cardiopath patients.\(^{23}\) In our series of 100 patients mean age was 48.11 \pm 16.78 years, which is comparable to other local studies.\(^{9,11}\) In our study there were 45% patients in the age ranges of 51-80 years. There was no mortality in any age group in this
series. Same results are also reported by a local study, which was conducted at Lady Reading Hospital, Peshawar, in which all patients were male with mean age of 49 years.\textsuperscript{22} While few local and international studies reported mean age of \( > 60 \) years in their studies.\textsuperscript{24,25} Differences in mean ages are probably due to sample selection criteria of various studies according to their inclusion criteria, as we have included patients from 20 years to 80 years, whereas in few studies they included older age patients e.g. from 40 to 90 years.

In one local study indirect hernia was present in 305 (65.5\%) patients while 160 (34.5\%) patients had direct hernia.\textsuperscript{9} While in another local study 51 (78.4\%) patients had direct while fourteen (21.6\%) patients had indirect recurrence.\textsuperscript{11} In this series out of 100 cases, indirect hernia was found in majority 55\% cases and in remaining 45\% cases direct hernia was found.

Hernia can in any side or both sides. Results of a local study showed that out of a total number of 50 patients 37 had right sided inguinal hernia and 13 had left sided inguinal hernia.\textsuperscript{22}

In another study out of a total of 204 inguinal hernias, right side was found in 115 (56.4\%) cases; and left side in 89 (43.6\%) cases.\textsuperscript{26}

Chronic pain is common after primary inguinal hernia repair in young males, but there is no difference in the pain associated with open mesh and non-mesh repair.\textsuperscript{27}

Postoperative increasing pain was complained by 12\% cases of our study at 2\textsuperscript{nd} week follow up, which is comparable with other national studies. It has been reported in one Pakistani study that the postoperative pain was complained in 10\% patients of mesh repair and 7.1\% in patients of Bassini’s repair.\textsuperscript{5} In another national study it has been reported that chronic pain was observed in 9\% patients at 1 month and 6\% at 6 months for mesh repair post-operatively.\textsuperscript{28} It was reported to be 6\% for prolene mesh and 8\% for nylon darn in an international study.\textsuperscript{29} While in our study at 1\textsuperscript{st} month follow up, postoperative pain was recorded in 6\% cases, which is comparable with an international study.\textsuperscript{29}

In a recent study the Lichtenstein inguinal hernioplasty was performed in 406 patients with non-complicated unilateral inguinal hernia. During reconstruction, the mesh was fixed to the inguinal canal floor without stitching its upper margin to the internal oblique muscle. Control of postoperative pain proved to be satisfactory; 72 hours after surgery, 26.1\% of patients no longer felt any pain, whereas 54.4\% had slight pain without the need for painkillers; on day 7, 92.8\% felt no pain at all. After 10 days, 86.7\% of those with sedentary jobs were able to return to work, whereas 79.1\% of those with heavier jobs resumed work in 11 to 15 days. This modification of the original Lichtenstein procedure permitted investigators to obtain satisfactory results with regard to the control of postoperative chronic pain and a rapid reprisal of normal working activity.\textsuperscript{30}

The goals of a successful hernia repair include low recurrence rates, permanent relief of pain or discomfort and low incidence of peri and postoperative complications, such as wound infections and intra-abdominal adhesions.\textsuperscript{31}

In a study of the 97 patients, the most commonly recorded risks included infection (100\%) and bleeding (100\%). Serious complications such as chronic pain (consented for at an average of 14\%), testicular complications (45.3\%) and visceral injury (52.1\%) were poorly accounted for at all levels.\textsuperscript{32}

Wound infection was observed in our study in 02\% patients at 2\textsuperscript{nd} week follow up and at 1\textsuperscript{st} month it was recorded in only 01\% case. Wound infection was superficial and was managed with antiseptic dressing and antibiotics. No patient required mesh removal for control of infection. Our findings are comparable with a local study in which the incidence of wound infection
reported as 7.5%. In few other local studies the incidence of wound infection has been reported from 1% to 4% cases.\textsuperscript{5,29,34-36}

Among the early postoperative complications; wound hematoma was found in 10% cases, seroma in 09% cases, urinary retention in 06% cases and scrotal swelling was recorded in 03% cases at 2\textsuperscript{nd} week follow up. Among the general complications; chest infection was observed in 2% cases, deep vein thrombosis in 01% case and urinary tract infection in 04% cases.

While at the 1\textsuperscript{st} month follow up less postoperative complications were seen in patients of this study. Wound hematoma was recorded in 06% cases, seroma in 04% cases, urinary tract infection in 03% cases, and scrotal swelling was noted in 01 case. Among the general complications; chest infection was observed in 01% case, urinary tract infection was also recorded in 01% case.

In a study, 3 intraoperative complications (a wound hematoma requiring return to the operating room, postanesthetic hypertension, and an ilioinguinal nerve injury) were reported in all patients who received surgical repair (0.8%). Postoperative complications (90 events) reported in 85 patients (22.3%) included wound hematomas (23 [6.1%]), scrotal hematomas (17 [4.5%]), urinary tract infections (8 [2.1%]), wound infections (7 [1.8%]), orchitis (6 [1.6%]), seromas (6 [1.6%]), urinary retention (1 [0.3%]), and other minor complications (22 [5.8%]).\textsuperscript{37}

Results of another local study showed that wound seroma developed in 8.4% patients in Lichtenstein tension free mesh repair (Group B); 3.1% patients in group B developed haematoma. Abscess formation was noticed in 1.9% patients in group B. Urinary retention developed in 4.6% patients in group B. Numbness or pain in the groin was complained by 10% patients in group B. Recurrence developed in 2(0.8%) patients in group B.\textsuperscript{5}

In a study done at Lady Reading Hospital, Peshawar, Pakistan, a total of 300 patients were enrolled at the department of Surgery. Clinical or operative evidence of nerve injury to the ilioinguinal nerve was observed in five cases (4.5%) of group 1 and four cases (2.8%) of group 2. More importantly the number of cases of hematoma formation and seroma formation in both the groups was similar. During the entire study 10 patients in all went into urinary retention; three of them required transient catheterization. Six patients (5.4%) were in group 1 and four (2.8%) were from group 2. Recurrence was in five cases overall at one year duration, 2 patients (1.8%) were from group 1 and 3 patients (2.1%) were from group 2, while only two patients complained of pain.\textsuperscript{38}

Another local study reported that minor wound infection was noted in two cases and seroma formation in one case. There were two cases of recurrence during initial follow up of one year. At the end they concluded that tension free mesh repair is the procedure of choice for inguinal hernia repair.\textsuperscript{22}

CONCLUSIONS:
We strongly recommended that propylene mesh repair is the first treatment option for patients with primary and recurrent inguinal hernias as it is safe, better procedure causing minimal complications, but must be covered with good antibiotics preoperatively.

REFERENCES


For correspondence:
Dr. Bakht Sarwar
Senior district surgeon,
District Headquarters Hospital,
Timergara, District Lower Dir,
Khyber Pakhtumkawa.
Cell No. 03005799019, 03449018148
Email: sarwars2001@yahoo.com