

## MESH HERNIOPLASTY : SURGEONS' TRAINING GROUND?

SHAMS NADEEM ALAM, SHAH MOHAMMAD, OBAIDULLAH KHAN, S. MANZAR

Department of Surgery, Dow University of Health Sciences & Civil Hospital, Karachi

### ABSTRACT

**Objective:** To clinically evaluate the outcome of Inguinal Hernioplasty in terms of haematoma, wound infection and recurrence, with special reference to surgery done by trainee surgeons.

**Design & Duration:** Case control study with prospective data collection, conducted from Sept. 2005 to August 2006.

**Setting:** Surgical Unit II, Civil Hospital, Karachi.

**Patients:** All male patients above 30 years of age with Inguinal hernia were included in the study. Patients presenting in emergency and those with age less than 30 years were excluded, as they did not undergo Mesh Hernioplasty.

**Methodology:** Patients with symptoms like chronic cough and constipation, and those with conditions like anaemia, diabetes and hypertension were optimized before surgery. Anaesthesia fitness was taken after necessary investigations. Patients were mostly operated under Regional (Spinal) anaesthesia. Two doses of a first generation cephalosporin or co-amoxiclav were used as a prophylactic antibiotic. Data was collected on a pre-designed proforma; record was also duplicated on the computer in the SPSS Version 10. Out patient follow-up was done for 6 months as a minimum.

**Results:** A total of 75 males with 78 inguinal hernias were operated during the study period; three patients had bilateral herniae. Sixty five percent of our patients had hernia on the right side and 31% on the left side, while 4% were bilateral. The ages of the patients ranged from 30 to 81 years; majority (72%) were under the age of 60 years. Sixty percent of the patients were manual workers. Sixty nine (88.5%) inguinal hernias were reducible and 9(11.5%) irreducible; 6(7.7%) were recurrent. Trainee surgeons did 70% of the operations. Haematoma occurred in five cases, seroma in nine, urinary retention in four, wound infection in four and recurrence in one case. No mortality occurred during the study.

**Conclusion:** In our set-up Mesh Hernioplasty has proven to be effective with low complication and recurrence rates. It is easily learnt by trainee surgeons. Early ambulation should be the aim. Cost of the mesh is a minor stumbling block, but the long term benefits of this hernia repair makes it the benchmark for all.

**KEY WORDS:** Inguinal Hernia, Lichenstein's Technique, Hernioplasty, Mesh Repair, Recurrence

### INTRODUCTION

Hernias especially inguinal hernias, being the commonest type, are a problem which has been dealt by physicians since the time of the Egyptian pharaohs. The mummy of Ramses 5th shows a hernial sac in the groin<sup>1</sup>. The hernia problem was referred to by Hippocrates as "etru rhexis", which means "rupture of abdominal wall". The distinction between the direct and the indirect inguinal

hernias was made by Stromayer in 1559. The picture became more clear with the description of the "processus vaginalis" in 1790 by John Hunter, and the "fascia transversalis" and the "Cooper's ligament" in 1804 by Sir Astley Cooper<sup>2</sup>.

There has been a lot of debate and different methodologies were adopted for what is considered an anatomical (mechanical) problem. The three layered technique originally described by Bassini<sup>3</sup> in 1887 changed the ways hernias were managed. It has since been "modified" by various authors and hence the original technique is no longer taught to the newer generation of surgeons.

Earl Shouldice<sup>4</sup> in 1953 described a modification to the Bassini's repair, relying on a 4-layer closure through a special continuous suturing technique thus doubling the fascia transversalis. His series of 8317 hernias over a 10 year period showed a recurrence rate of 0.8%.

### Correspondence:

Dr. Shams Nadeem Alam, Assistant Professor,

Department of Surgery, Dow University of Health Sciences & Civil Hospital, Karachi.

Phones: 0300-8204483.

E-mail: shamsalam@hotmail.com

One big drawback of both the "original" Bassini's and Shouldice repairs is that the surgeon in training may find the method difficult to master and achieve good results<sup>5</sup>. The posterior iliopubic tract technique was championed by Nyhus<sup>6</sup>; the main strength of this repair comes from suturing the arch of the transversus abdominis aponeurosis to the iliopubic tract. The recurrence rate has been reported as around 2%.

The first non-metallic fabric (Dacron) was knitted into a mesh (Mersilene) in 1939. Usher introduced in 1950 the polypropylene mesh<sup>7</sup> (Marlex). Lichenstein and Shulman<sup>8</sup> in 1986 described their simple, easy to learn yet effective technique. Irving Lichenstein was the one who popularised tension free techniques as an every day, outpatient procedure under local anaesthesia.

Stoppa<sup>9</sup> in 1975, introduced his technique to repair huge groin hernias by using a giant mesh posteriorly through a midline incision. A plug and mesh (Gilbert-Rutkow) or a polypropylene device Prolene Hernia System (PHS) has been advocated by Gilbert<sup>10</sup> for day case inguinal hernia repair. A 1.5% recurrence rate has been recorded after long term follow up though Fasih et al<sup>11</sup> has quoted a figure of 0.5%. In 1990 special techniques to repair the groin hernias such as TAPP (transabdominal preperitoneal approach<sup>12</sup> and TEP (total extraperitoneal approach) were started. The basis of the repair, independent of the type of approach, is the use of a large piece of mesh to cover all the three potential sites of the hernia defects i.e. indirect, direct and femoral<sup>13</sup>.

Laparoscopic hernia repairs are less painful than open repairs and allow an early return to work; however they may be associated with serious complications and certainly have a much higher hospital costs<sup>14</sup>. Long term data is slowly becoming available regarding this newer modality of treatment.

Desarda<sup>15</sup> in 2001 postulated that inguinal hernia operations are generally based on anatomical considerations alone and the failures of such operations are due to lack of consideration of physiological aspects. Many patients with inguinal hernia are cured as a result of the current surgical techniques, though factors that prevent hernia formation are not restored. Hence, the surgical physiology of the inguinal canal needs to be reconsidered. This is an interesting new concept although no other author has evaluated this theory as yet.

In view of the long historical background, the paucity of local data, and the apprehension of using polypropylene mesh for hernioplasty in a government teaching hospital with theatres where all kinds (clean, contaminated and dirty) of cases are carried out, the need was

felt to train young surgeons in the easy to learn Lichenstein hernioplasty and to carry out a study to evaluate the outcome with reference to haematoma formation, wound infection and recurrence.

## PATIENTS & METHODS

This case control study was carried out from Sept. 2005 to August 2006 in Surgical Unit II of Civil Hospital Karachi, attached to Dow Medical College, on all male patients above 30 years of age admitted with inguinal hernia. Patients operated in emergency and those below 30 years of age were excluded, as they underwent a non-mesh repair.

All patients were evaluated for symptoms like chronic cough, constipation and prostatism, and had appropriate investigations done. Patients were optimized for the above described conditions and co-morbidities like diabetes, anaemia and hypertension. Patients were seen in the pre-anaesthesia clinic and surgery was carried out after fitness, mostly under spinal anaesthesia. General anaesthesia was used where it was thought to be safer. Analgesia was provided on patients required need (PRN) in the form of intra-muscular Diclofenac sodium for 24 hours postoperatively, followed by oral analgesia.

First generation cephalosporin like Cephadrine or Co-amoxiclav was used as prophylactic antibiotic; the first dose was administered at the time of induction of anaesthesia and a second dose eight hours postoperatively. Patients had the initial dressing removed after 48 hours and then povidone-iodine was applied and the wound dressed regularly.

All data was collected on a pre-designed proforma. The record was duplicated on the computer in the SPSS Version 10. Out patient follow-up was done for 6 months as a minimum.

## Surgical Technique

Standard open technique as described by Nelson<sup>16</sup> was used for both direct and indirect hernial sacs. The corners of the polypropylene mesh (6 x 11cms) size were trimmed and a slit, nearly half the length of the mesh, was created for the cord to go through. The lower edge of the mesh was anchored to the inguinal ligament with 2/0 polypropylene in a continuous manner starting at the pubic tubercle and ending just beyond a coincident point past the level of the deep ring. The mesh was next anchored by 3 to 4 interrupted stitches to the conjoint tendon and internal oblique muscle. The upper leaf of the mesh is pulled over the lower leaf like a double breast coat and the lower edge of the upper leaf and lower edge of the lower leaf together were stitched with

Age Group	Number	%
30-39 years	15	20.0
40-49 years	19	25.3
50-59 years	20	26.7
60-69 years	14	18.7
70-79 years	6	8.0
> 79 years	1	1.3
<b>Total</b>	<b>75</b>	<b>100</b>

**Table I. Age Distribution (n=75)**

2/0 polypropylene to the inguinal ligament. Care was taken that the opening, the "new" deep ring, from where the spermatic cord passed was optimally snugged; this was tested by trying to get the tip of the little finger in. Haemostasis was secured and external oblique closed with '0' polyglycolic acid suture. As a routine no drain was placed. Skin was closed with a subcutaneous 2/0 polypropylene suture.

## RESULTS

A total of 75 male patients with 78 hernias were seen

**Table II. Side of Inguinal Hernia**

Side	Number	%
Right side	49	65.3
Left side	23	30.7
Bilateral	3	4.0
<b>Total</b>	<b>75</b>	<b>100</b>

**Table III. Types of Inguinal Herniae (n=78)**

Type	Number	%
Direct	31	39.7
Indirect	47	60.3
Complete	17	21.8
Incomplete	61	78.2
Reducible	69	88.5
Irreducible	9	11.5
Recurrent	6	7.7

Occupation	No.	%
Office worker	11	14.7
Light Manual worker	24	32.0
Heavy Manual worker	21	28.0
Retired	19	25.3

**Table IV. Occupation of Patients (n=75)**

in the study, as three patients had bilateral hernias which were operated at the same time. The ages of the patients ranged from 30 to 81 years (Table I). Most inguinal hernias were seen on the right side (Table II) and most of them were reducible (Table III).

As far as the occupation of the patients was concerned, most were found to be labourers (Table IV). The categorization of the surgeons performing the surgery, depicted in Table V, is as follows:

Category-A=Consultants with surgical experience of >10 more years.

(Professors & Associate Professors)

Category-B=Consultants with surgical experience of >5 years. (Assistant Professors &

Senior Registrars)

Category-C=Residents & PGs with 3 years experience.

Category-D=House Officers.

The recorded complications both in the immediate post operative period and in the follow up are given in Table VI, commonest complication being seroma formation.

**Table V. Category of Surgeons (n=78)**

Category	Number	%
Category A	3	3.8
Category B	20	25.6
Category C	55	70.5

**Table VI. Complications**

Complication	Number	%
Seroma	9	11.5
Haematoma	5	6.4
Urinary retention	4	5.1
Wound infection	4	5.1
Recurrence	1	1.3

**DISCUSSION**

Since Lichenstein and Shulman<sup>8</sup> published their paper "Ambulatory outpatient hernia surgery, including a new concept, introducing tension free repair" in 1986 and then in 1987 Lichenstein<sup>17</sup> published his findings on the simple yet effective method of using polypropylene mesh for the repair of 6321 inguinal hernias, surgeons all over the world have adopted the method and reproduced similar results. Kark et al<sup>18</sup>, Gourgiotis et al<sup>19</sup> and Neumayer et al<sup>20</sup> showed the ease and flexibility which the tension free repair had to offer by their results.

In our series of 75 male patients, majority (72%) were under the age of 60 years, thus still active in their respective professions and early return to work was of paramount importance to them. Sixty percent patients were manual workers and daily wage earners, hence ambulation was the immediate concern. The Lichenstein's technique does facilitate early ambulation and early return to work.

Our series showed that nearly 70% operations were performed by trainee surgeons and the rest by consultants. Initially all the trainees were supervised directly and asked to follow the standard described technique. Although not directly recorded but the general impression was that the learning curve was steep and efficiency increased over time. Hernias initially thought to be "difficult" by the trainees, were over time more easily dealt by them and with less direct supervision. Chan et al<sup>22</sup> in their study described similar findings, that trainee surgeons acquired the skills easily.

We generally did not use drains, unless the hernia was significantly large. Out of the nine irreducible hernias five and one recurrent hernia had drains put in i.e. a total of six hernias had to be drained. Five cases developed haematomas which presented in the early post-operative period, four of them settled over a period of 5-8 days but one needed evacuation under anaesthesia. All the nine seromas settled on conservative management. Four patients with urinary retention had to be catheterized for a period ranging from 24 hours in three to 72 hours in one. Superficial wound infection was seen in four cases which settled with regular dressings, though in two cases oral antibiotics had to be given for one week. These results are comparable with those of Choudry et al<sup>23</sup>, Majeed and Mehmood<sup>24</sup> and Ahmad et al<sup>25</sup>, although the latter used a Redivac suction drain and continued oral antibiotics after three doses of intravenous antibiotics. Najamulhaq and colleagues<sup>26</sup> reported a 3% wound infection in their series, without the use of prophylactic antibiotics. This certainly is very thought provoking and needs to be duplicated by others locally.

Shulman and Lichenstein<sup>21</sup> in their follow-up study in 1995 showed that 72 European and American general surgeons with no special interest in hernia repairs, using their technique in 16,068 operations had a recurrence rate under 0.5%. We had only one (1.2%) recurrence out of 78 hernias repaired. The patient was a 75 years old gentleman, known diabetic and smoker, with a large irreducible hernia. He developed recurrence at 5 months postoperatively. He was re-operated and is currently followed-up in the OPD. Our recurrence rate of 1.2% is comparable to that of Choudry et al<sup>23</sup> (1.2%) and, Farooq and Rehman<sup>27</sup> (1.5%). Other authors like Kark et al<sup>18</sup> and Sakorafas et al<sup>28</sup> with large series (>500 cases) showed a recurrence rate of less than 1%. This should be the aim of our future authors.

**CONCLUSION**

Lichenstein Hernioplasty is an internationally proven safe technique. In our local setup it has proved effective with low complication and recurrence rates. It is a procedure which is easily learnt by the trainee surgeons. Early ambulation should be the aim. The cost of the mesh is a minor stumbling block, but long term benefits of this hernia repair makes it the benchmark for all.

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