East African Scholars Journal of Medicine and Surgery
Abbreviated Key Title: EAS J Med Surg
ISSN: 2663-1857 (Print) & ISSN: 2663-7332 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-5 | Issue-2 | Feb-2023 | DOI: 10.36349/easjms.2023.v05i02.001

Original Research Article

Clinical Study of Inguinal Hernia Its Management at TRR Institute of Medical Sciences, Patancheru

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Article History
Received: 03.01.2023
Accepted: 09.02.2023
Published: 14.02.2023

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Inguinal hernias are 75% off all abdominal wall hernias, life time risk of developing hernias is 24%. In the present study to analyze age incidence, type of complications and duration of presentation to analyze post operative to analyze the post-operative complications in inguinal hernia swelling like infection, chronic grin pain, hematoma, scrotal swelling and recurrences, at the end of study Lichtenstein hernioplasty has least complications, ambulate early, return to work early, less post operative pain, reduced incidence of chronic groin pain and least recurrence after surgery was concluded.

Keywords: Inguinal hernias, complications.

INTRODUTION

Inguino Scrotal swellings form an overall prevalence rate of 3.2%. Majority of inguino scrotal swellings (96%) are Hernias. Indirect hernias out number Direct Hernias by about 2:1 ratio. Right sided groin hernias are more common than those on the left, probably due to late descent of right testis. The prevalence of Inguinal Hernias is clearly age dependent. The current risk for a male to have an Inguinal Hernia is 18% and life time risk of 24%.

AIMS AND OBJECTIVES OF THE STUDY

To study about Inguinal Hernias and its Management at TRR INSTITUTE OF MEDICALSCIENCES during the period of June 2021 to January 2023.To understand the anatomy and physiology of inguinal canal and pathogenesis of inguinal hernias.

- To analyse the age incidence, type of complication and duration of presentation.
- To analyse the nature of content and its mode of presentation and type of treatment.
- To study about the technique and physiology of repair of inguinal hernia swellings.
- To analyse the post-operative complications in Inguinal Hernia Swellings like infection, chronic groin pain, hematoma, scrotal swellings and recurrences.

STUDY MATERIALS & METHODS

Study Place

This study is based on the analysis of the cases of Inguinal Hernias in TRR INSTITUTE OF MEDICAL SCIENCES, PATANCHERU.

Study Duration

During JUNE 2021 to JANUARY 2023.

Study Population

All cases of Inguinal Hernias were taken up for study admitted in surgical wards of TRR General Hospital.

Study Design

This is a consecutive study of 90 cases during the period June 2021 to January 2023.

All cases were admitted and treated in all 4 units of General Surgery.

The age, incidence, duration of presentation, and detail history were taken.

In clinical examination the general condition,

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side, type of swelling, type of hernia, type of complication were studied.

They were investigated by plain X-ray abdomen erect view, X-ray Chest P. A. view, ECG and base line investigations like blood sugar, urea, creatinine, complete hemogram, urine examination, bleeding time and clotting time done for all cases.

Surgical management was performed in all cases. Most of the surgery was performed in spinal anesthesia, few were done in general anesthesia.

During the surgery the type of hernia, type of content and the magnitude of hernia were noted. Post operatively all cases were followed up regularly.

In the follow up wound infection, hematoma, pain, scrotal swelling, recurrence were noted.

Total No. of cases Re-admitted: 1 after follow up recurrence and treated.
Total No. of complications: 0

Inclusion Criteria

1. Patients with primary groin hernias.
2. Both unilateral and bilateral groin hernias.
3. Patients aged 15 to 80 years.
4. ASA Grade 1 to 3.

Exclusion Criteria

1. Recurrent Inguinal hernias.
2. Femoral hernias.
3. Previous preperitoneal surgery.
4. ASA Grade 4, 5

Number of Cases

90 CASES admitted in general surgical department of TRR General Hospital.

OBSERVATIONS AND RESULTS

1. Age Incidence

In our study out of 90 cases 1 was between 15 to 20 years of age, 8 patients were of 3rd decade, 12 were in the 4th decade, 14 were in the 5th decade, 20 were in the 6th decade and 35 were above 60 years of age.

Table - I: Age Incidence

Age	Number of Patients	Percentage
15- 20 years	1	1.11
21-30 years	8	8.88
31-40 years	12	13.33
41-50 years	14	15.55
51-60 years	20	22.22
> 60 years	35	38.88

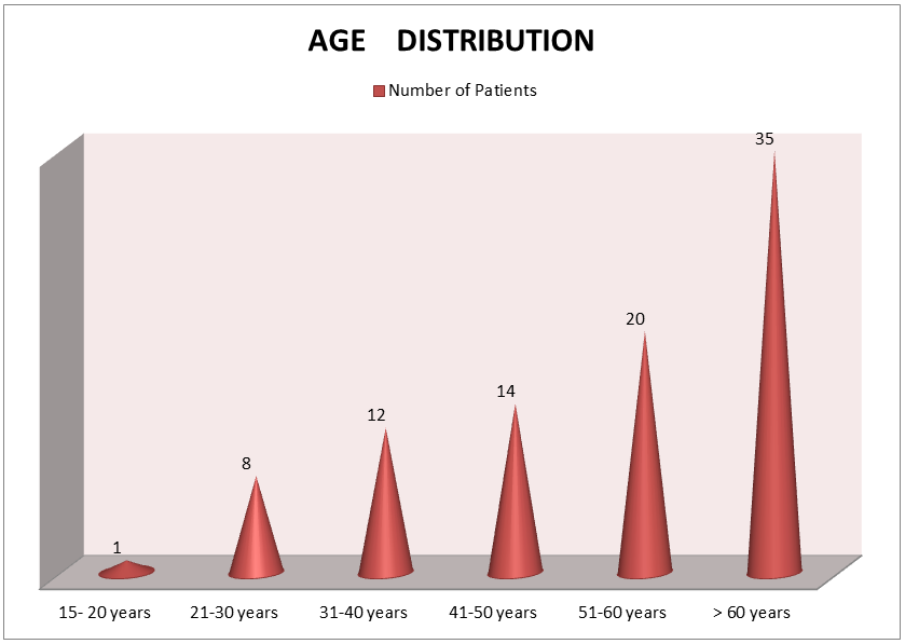

Figure Chart– 1: Age Distribution

2. Time duration of the Presentation

Most of them reported to the hospital for

treatment before 6 months from the onset of symptoms. Maximum late presentation was 2 years and 3 months; the earliest presentation was 1 week.

Table – 2: Time of Presentation

Time	Number of Patients	Percentage
< 1 month	2	2.22
1 to 3 months	24	26.66
3 to 6 months	35	27.77
6 to 9 months	16	17.77
9 to 12 months	8	8.88
> 12 months	5	5.55

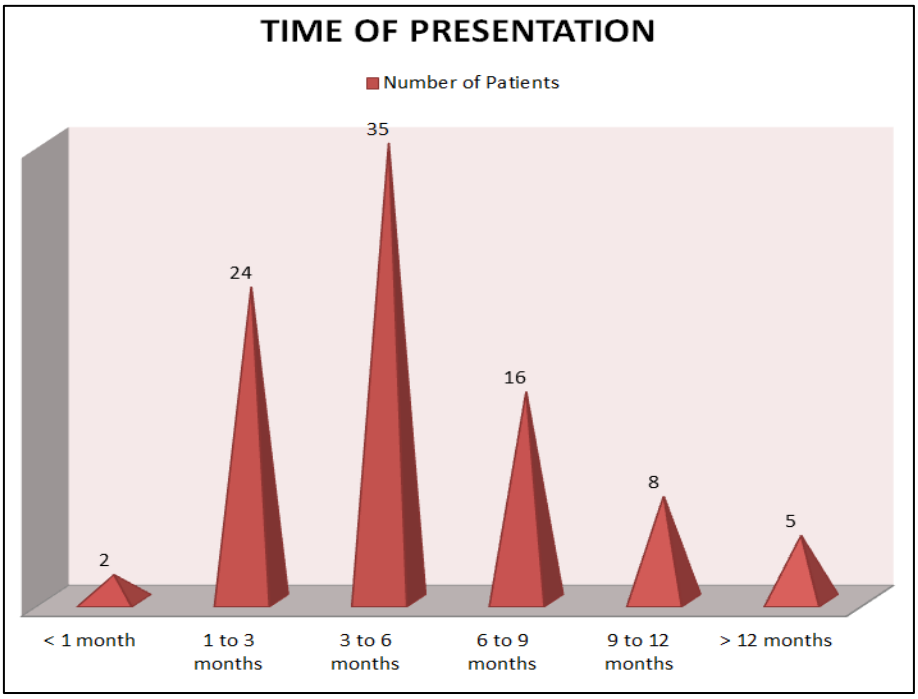

Figure Chart – 2: Time of Presentation

3. Type of Hernia

In our study 90 patients belonged to Hernia. Out of which 13 was direct hernia, 77 were indirect hernias.

Table – 3: Type of Hernia

Type	Number of Patients	Percentage
Direct	13	14.44
Indirect	77	85.88

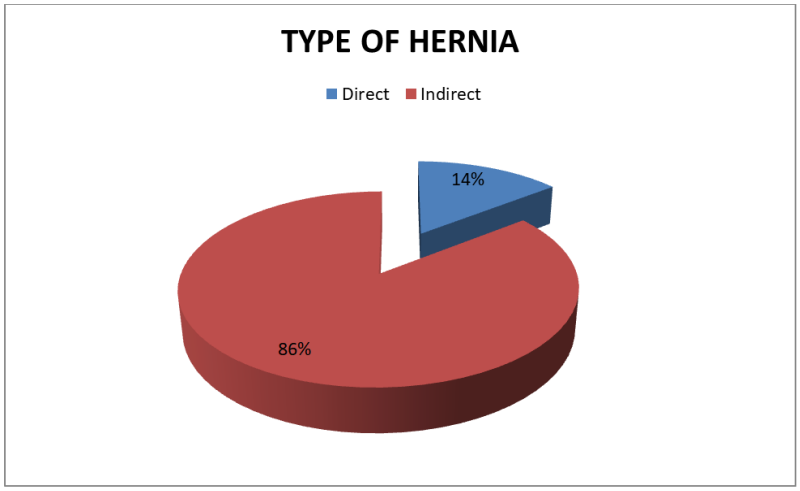

Figure Chart 3: Type of Hernia

4. Side Analysis of hernia

In our study 59 patients had right sided inguino-scrotal swelling, 26 patients had left sided, 5 were of bilateral inguino-scrotal swelling.

Table – 4: Side Analysis

Side	Number of Patients	Percentage
Right	59	65.55
Left	26	28.88
Bilateral	5	5.55

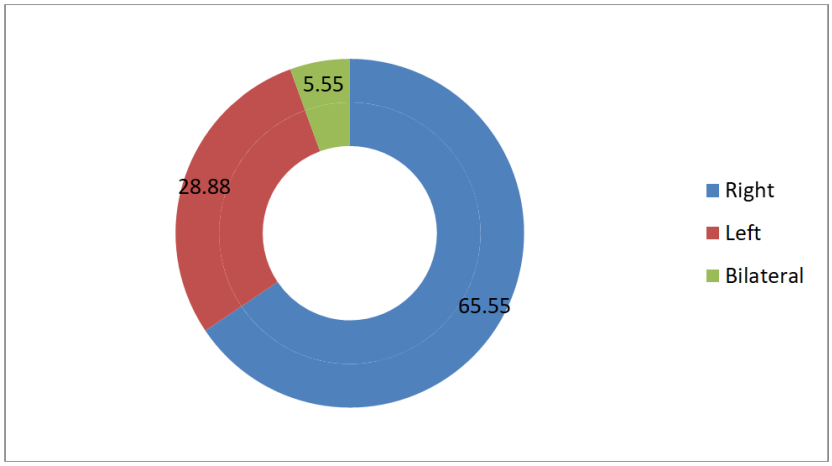

Figure Chart – 4: Side Analysis

5. Content of Hernia

In our series of study of 90 patients it was found that 51 patients had bowel as content and 39 patients had omentum as content.

Table – 5: Content of Hernia

Content	Number of Patients	Percentage
Bowel	51	56.66
Omentum	39	43.33

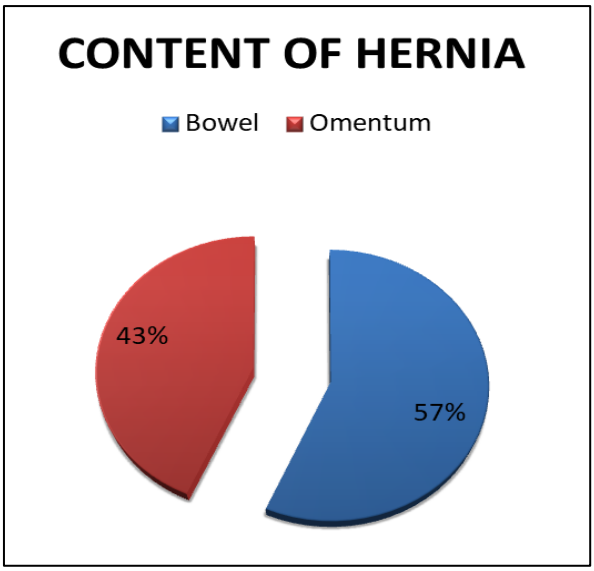

Figure Chart – 5

6. Complications on Presentation

In our series 9 were irreducible, 4 were obstructed hernias and 2 were strangulated hernias.

Table – 6: Complications on Presentation

Complications	Number of Patients	Percentage
Irreducible	9	10
Obstructed	4	4.44
Strangulated	2	2.22

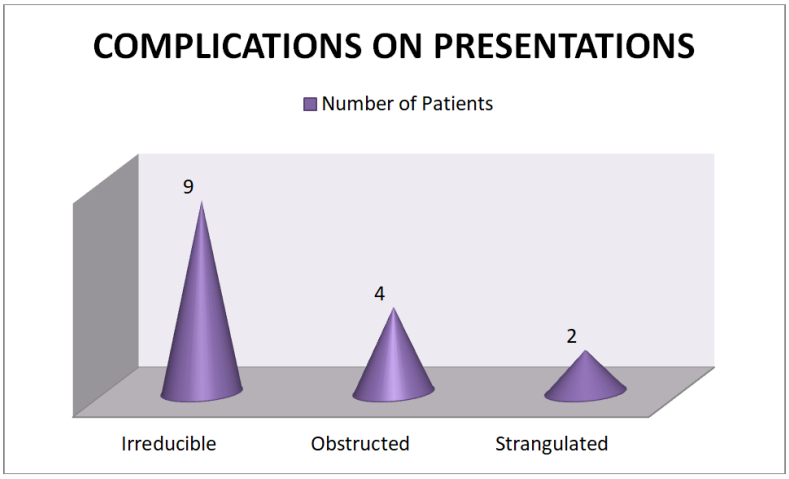

Figure Chart 6

7. Nature of Surgery

In our study of 90 CASES which have underwent surgeries here, 27 patients were treated with Herniorrhaphy, 55 were treated with Hernioplasty, 5 underwent reduction with Herniorrhaphy, 3 had to undergo resection and anastamosis with Herniorrhaphy.

Table – 7: Nature of Surgery

Nature	Number of Patients	Percentage
Herniorrhaphy	25	27.77
Hernioplasty	52	57.77
Reduction with Herniorrhaphy	5	5.55
Resection and anastamosis with Herniorrhaphy	3	3.33
Stoppa's Procedure	5	5.55

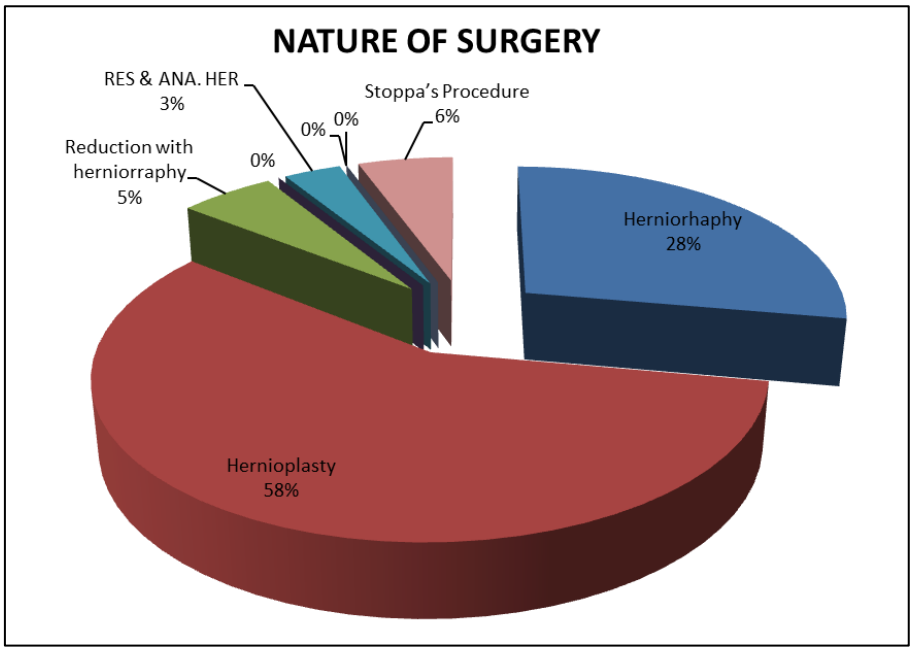

Figure Chart –7: Nature of Surgery

8. Post-Operative Complications

In our study 2 patients had wound infections, 2 had groin pain, 1 had hematoma, 1 had scrotal swellings, 1 had Recurrence.

Table – 8: Post-Operative Complications

Complications	Number of Patients	Percentage
Wound Infections	2	2.22
Groin Pain	2	2.22
Hematoma	1	1.11
Scrotal Swelling	1	1.11
Recurrence	1	1.11

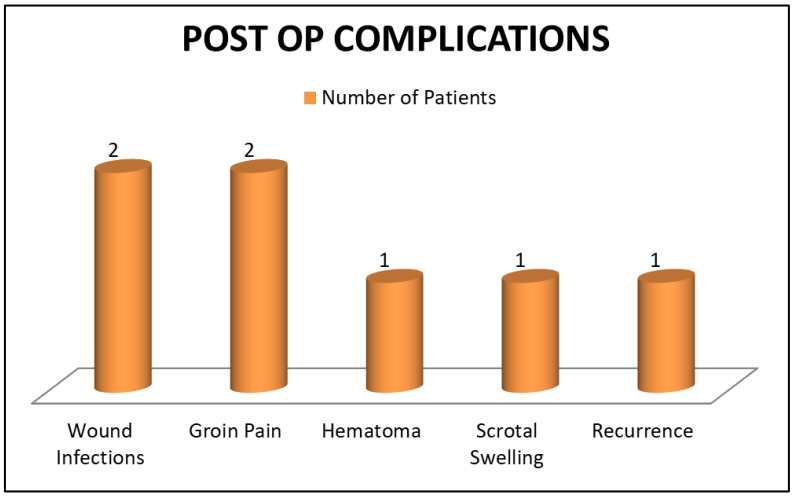

Figure Chart – 8: Post-Operative Complications

9. Complications following Nature ofSurgery

In our series of 90 cases which had underwent surgeries here, 2 patients had complications following Herniorrhaphy, patient had minor complication of hematoma following Hernioplasty, 2 had minor complications after Reduction and Herniorrhapy and patient after resection and anastamosis with herniorrhaphy.

Table – 9: Complications Following Nature of Surgery

Nature	Number of Patients	Percentage
Herniorrhaphy	2	8.00
Hernioplasty	1	1.81
Reduction with Herniorrhaphy	2	40.00
Resection and anastomosis with Herniorrhaphy	1	33.33

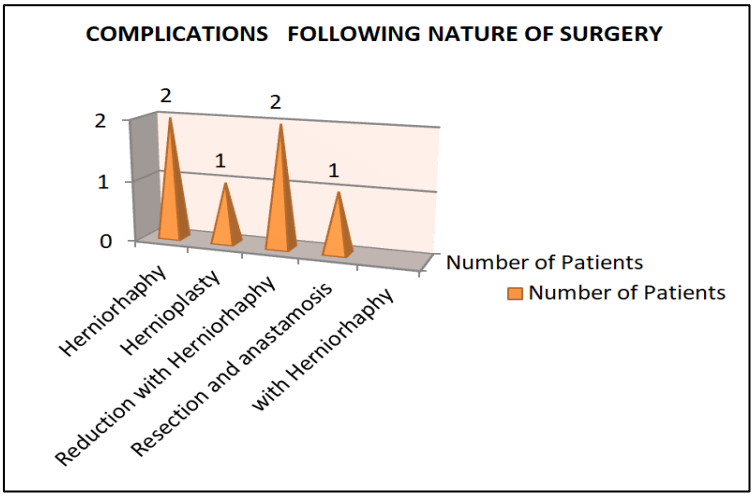

Figure Chart– 9

10. Recurrence Following Procedure

In our series of 90 cases in which 25 have undergone Herniorrhaphy and 52 have undergone Hernioplasty One patient had recurrence following Herniorrhaphy, None had recurrence following Hernioplasty.

Table – 10: Recurrence Following Procedure

Recurrence	Number of Patients	Percentage
Herniorrhaphy	1	1.11
Hernioplasty	0	0.00

DISCUSSION

Inguinal Hernias are a penalty to change of life style from quadripedal to bipedal locomotion acquired through the ages.

In our study of 90 cases at our hospital, Indirect Inguinal Hernia was 77 patients, which is about 85.88% of the whole cases of study. Direct Inguinal Hernia comprised of 13 patients, forming about 14.44%, surgical option for inguinal hernias in Adults are:

1. Herniorraphy.
2. Hernioplasty.
3. Reduction and Herniorraphy.
4. Resection and Anastomosis followed by Herniorraphy.
5. Excision.
6. Orchidectomy.

A good hernia repair should last the patient for the rest of life. No matter what his age is, at the time of operation.

The technique described for the repair of an Inguinal Hernia is called the anatomical method of repair, because the various tissue planes are opened separately and closed in reverse order, with the preservation of all tissue structures.

The basic tenets in the repair of an Inguinal Hernia are:

1. High ligation (Indirect hernia) and Excision of the sac.
2. Repair of the defect in the plane of its occurrence, which is in the posterior inguinal floor.
3. The suture of fascia to fascia in the same tissue plane and without tension on the suture line.
4. The time honoured method of Bassini and Halsted are neither anatomic nor physiologic.

In the case of direct hernia there are differences of opinion regarding the excision of sac:

1. Frequently intra peritoneal viscera are adherent to the wall of the sac to form a pseudo sliding component.
2. A true sliding hernia of the Bladder is invariably present and its corrections considered essential in the performance of the hernial repair. In fact the failure to excise the sac and to correct concomitantly the sliding hernia of the bladder are believed to be the basic factor in the high recurrence rate following the operative correction of direct hernia.

The major objection to opening the sac in direct hernia sac is the fear of injury to the Bladder.

In the case of bilateral hernias they should not be corrected at the same operation, because of fear of wound infection, produce excessive tension on the suture line of repair and so recurrence rate is high.

Herniorrhaphy [1]

In adult simple herniotomy is not sufficient to prevent recurrence of the hernia. The natural barriers to herniation (muscles and fascia of the region) have failed, and their function must be replaced by a mechanical barrier of either natural tissue in the area (or) synthetic material.

Pure Tissue Repair

The Shouldice Operation [2]

It is basically multilayered Bassini operation repair of the Transversalis fascia and tightening of the internal ring is the basis of tissue repair.

Transversalis fascia is split open from the medial pillar of the internal ring to public tubercle.

First layer: Free edge of the lower flap brought high behind the upper flap to the posterior aspect of transversalis fascia as well as the posterior aspect of the rectus sheath and the aponeurosis of the transversus abdominis. First bite starts from public tubercle to ring around the cord. The same suture material is continuously used for second layer.

Second layer begins at lateral end of the repair suturing the free edge of the upper flap of transversalis fascia to the base of the lower edge and Ilio public tract and to the inguinal ligament upto the public tubercle where it is tied to its original tail.

This double layer suture gives new strength to posterior wall of the canal. The posterior wall is further strengthened by approximating the conjoined tendon to the reflected part of the inguinal ligament. Recurrence

rate is < 1%only.

Darn Repair

Aim is to approximate the rectus sheath and conjoined tendon to the inguinal ligament [2].

Mixed Tissue / Prosthetic Repair

In order to reinforce the posterior wall of the canal along with tissue repair prosthetic mesh is used.

Lichtenstein Plastic Screen Reinforcement

Lichtenstein plastic screen reinforcement is used for direct, indirect and recurrent hernia; the mesh is sutured to inguinal ligament and transversus abdominis and internal oblique [3].

Porous mesh permits the penetration and deposition of thick layer of reactive fibrous tissue that permanently, buttresses the posterior wall of the canal.

Giant Prosthetic Reinforcement of the Visceral Sac the Stoppa Groin Hernia Repair [4]

The essential feature of GPRVS is the replacement of the transversalis fascia in the groin by a large prosthesis that extends far beyond the myopectineal orifice of Fruchaud. It is bounded superiorly by the internal oblique and transversus abdominis muscles, medially by the rectus muscle and sheath, laterally by the iliopsoas muscle, and inferiorly by Cooper's ligament. Critical anatomic landmarks such as the inguinal ligament, spermatic cord, and the femoral vessels are contained within this area. This funnel-shaped orifice is lined in its entirety by the transversalis fascia. Fruchaud's concept is the fundamental cause of all groin hernia failure of the transversalis fascia to retain the peritoneum. Furchaud was Rene Stoppa's mentor and his influence led Stoppa to develop GPRVS.

Bilateral GPRVS may be achieved through a subumbilicial midline or a Pfannenstiel incision. The properitoneal space is cleaved in all directions, exposing the space of Bogros and the space of Retzius, the superior ramus of the pubis, the obturator foramen, iliac vessels, and the iliopsoas muscle. The elements of the spermatic cord are parietalized.

The chevron-shaped mesh is tailored to the patient and should measure transversely 2 cm less than the distance between the anterior iliac spines and vertically should measure the distance between the umbilicus and symphysis pubis. In obese patients, the mesh should be several centimeters wider than the interspinous dimensions. The superior edge of the chevron should slant downward 4 cm and the inferior edge 6 cm. The prosthesis is implanted by eight. Rochester- Pean clamps that grasp the corners and perimeter of the mesh. Recurrences tend to be indirect, especially if the deep ring has been moved laterally as the result of repeated unsuccessful hernioplasties. To ensure success in these instances, the prosthesis may be made wider, and a spilt washer of polyproylene mesh 3 cm to 4 cm in diameter may be used to encircle the cord at the level of the deep ring. Closed suction drainage is necessary when hemostasis is complete.

Mesh Plug and Patch

The mesh plug technique was developed by Gilbert and then modified by Rutkow and Robbins, Millikan, and others. The groin is entered through a standard anterior approach. The hernia sac is dissected away from surrounding structures and reduced back into the pre-peritoneal space. A flat sheet of polypropylene mesh is rolled up like a cigarette and held in place with suture. This plug is inserted in the defect and secured to either the internal ring for an indirect hernia, or the neck of the defect for a direct hernia, using interrupted sutures. The use of a prefabricated, commercially- available prosthesis that has the configuration of a flower is recommended by Rutkow and Robbins. The prosthesis is then individualized for each patient by removing some of the petals to avoid unnecessary bulk. Millikan further modified the procedure by recommending that the inside petals be sewn to the ring of the defect. For indirect hernias the inside petals are sewn to the internal oblique portion of the internal ring, which forces the outside of the prosthesis underneath the inner side of the defect, making it act like pre-peritoneal underlay. For direct hernias, the inside petals are sewn to Cooper's ligament and the shelving edge of the inguinal ligament as well as the musculoaponeurotic ring of the defect superiorly, again forcing the outside of the mesh to act as an underlay [5].

The patch portion of the procedure is optional, and involves placing a flat piece of polypropylene in the inguinal space, widely overlapping the plug in a fashion similar to the Lichtenstein procedure. The difference is that only one or two sutures, or perhaps no sutures, are used to secure the flat prosthesis to the underlying inguinal floor. To the credit of its proponents, the plug and patch, in all of its varieties, has been skillfully presented and has rapidly become a popular repair.

Nyhus/Condon (Iliopubic Tract Repair)

A transverse lower abdominal incision is made two finger breadths above the symphysis pubis. The anterior rectus sheath is opened on its lateral side to allow the rectus muscle to be retracted medially, and the two oblique and the transversus abdominis muscles are incised, exposing the transversalis fascia. A combination of sharp and blunt dissection inferiorly opens the preperitoneal space and exposes the posterior inguinal floor. Direct or indirect defects are repaired similarly after the peritoneal sac has been reduced or divided and closed proximally. The tranverse aponeurotic arch is sutured to the iliopubic tract

inferiorly, occasionally including Cooper's ligament in the first few medial sutures. If the internal ring is particularly large, a suture is also placed lateral to the internal ring. For femoral hernias the iliopubic tract is sutured to Cooper's ligament to close the canal.Once the defect has been formally repaired, tailored mesh prosthesis can be sutured to Cooper's ligament and the transversalis fascia for reinforcement [6].

Trans-Abdominal Preperitoneal (TAPP) Procedure

The surgeon stands on the opposite side of the table from the hernia. The first assistant stands opposite the surgeon [7]. Three laparoscopic cannulae are placed in a horizontal plane with the umbilicus. The sizes of the cannulae vary. A 10 mm cannula at the umbilicus allows the surgeon to use the larger 10-mm laparoscope and facilitates the introduction of a sufficiently sized mesh into the peritoneal cavity. An open technique for placement of the intial cannula to minimize the possibility of bowel injury. The two additional cannulae are placed just lateral to the rectus muscles. After an initial diagnostic laparoscopic procedure, pertinent anatomic landmarks including the median and medial umbilical ligaments, the bladder, the inferior epigastric vessels, the vas deferens, the spermatic vessels, the external iliac vessels, and the hernia defect are identified. An incision of the peritoneum is initiated at the medical umbilical ligament at least 2 cm above the hernia defect and extended laterally toward the anterior superior iliac spine. The preperitoneal space is exposed using a combination of blunt and sharp dissection, mobilizing the peritoneal flap inferiorly. The symphysis pubis, Cooper's ligament, the iliopubic tract, and the cord structures are identified. Direct hernia sacs are reduced during this dissection. Indirect sacs are more difficult to deal with, as they can be tenaciously adherent to the cord structures. The cord must be skeletonized, but care must be taken to minimize trauma, to prevent damage to the vas deferens or the blood supply to the testicle.

A small sac should be reduced, but if it is large and/or extending into the scrotum, it may be divided. The proximal sac is then closed before reduction, and the distal sac is distally as far as possible on the side opposite the cord. The dissection of the cord structure is completed by removing excessive fatty tissue to prevent a pseudorecurrence caused by a "lipoma" of the cord. Finally, the peritoneal flap is dissected inferiorly well proximal to the divergence of the vas deferens and the internal spermatic vessels. This assures that the prosthesis will lie flat in the preperiotneal space and will not roll up when the peritoneum is closed.

Placement of the prosthesis is the next step. A large piece of mesh, 15x11 cm or greater, is introduced into the abdominal cavity through the umbilical cannula and is positioned over the myopectineal orifice so that it completely covers the direct, indirect and femoral spaces. Some surgeons prefer to slit the mesh to accommodate the cord structures, while others prefer to simply place the prosthesis over them. Fixation of the mesh is controversial. If a large enough mesh is used, no staples are required, which avoids complications associated with the trauma related to the fixation device. Most surgeons fear the possibility of mesh shrinkage or migration.

Bilateral hernias can be repaired using two separate peritoneal incisions or one long transverse incision extending from one anterosuperior iliac spine to the other on the opposite side. If two separate incisions are used (which avoids the theoretical problem that might occur if the patient has a patent urachus), the two preperitoneal spaces should be joined by dissecting behind the peritoneum and bladder in the space of Retzius so that a large prosthesis can be used in a manner similar to Stoppa's giant prosthetic reinforcement of the visceral sac (GPRVS) [7].

Totally Extraperitoneal (TEP) Procedure

This operation is modeled after the Cheatle-Henry preperitoneal hernioplasties to address some of the major criticisms of the laparoscopic TAPP procedure, namely the need to enter the peritoneal cavity and the attendant risk of injury to an intra-abdominal organ, intestinal obstruction secondary to adhesive complications, or trocar site herniation. An incision is made at the umbilicus as if one were planning to perform open laparoscopy. The rectus sheath is opened on one side and the rectus muscle is retracted laterally. The operation then proceeds in an identical fashion to the TAPP procedure described above [7].

Which were comparable with Vincent PJ *et al.,* study April 2003 study in which indirect Hernia comprised of 76.12%.

In our study maximum occurrence of Inguinal hernias were above 60 years of age forming nearly 38.88% of the total numbers of cases taken in the study group of 90 cases here.

Which is comparable to the study of Stanley D. Berlimer his study mean age group is 56 years. It implies the incidence of inguinal Hernia swellings increases with the AGE.

In our study of 90 cases the contents of the Hernial sac, Bowel constituted for about 51 in number comprising 56.66% whereas Omentum was in 39 patients forming 43.33%.In our study Right side is more affected 59 of them (65.55%) compare to Left side 26 of them (28.88%) and in Bilateral of the 5 patients (5.55%), similar to the study by P.K. Amid in 2005 comprising of 68.4%,26.4%, & 5.4% respectively of right, left and bilateral inguinal hernias.

Complications at the time of presentations

were irreducibility, the commonest forming 9 patients (10%), obstruction 4 patients (4.4%), and strangulation 2 patients (2.22%).

In our study minor post-operative complications were noted. Following Herniorrhaphy there were 2 cases which constitute nearly 8% of them. Hernioplasty there was only 1 case having hematoma which constitutes about 1.81% of them.

Reduction with herniorrhaphy was 2 cases having minor complications constituting 40%, Resection and Anastomosis with herniorrhaphy one case having minor complication constituting 33.33%. All were treated.

In our study of 90 cases there was only one case which underwent herniorrhaphy having recurrence among all cases in our study constituting 1.11% only.

CONCLUSION

Prevention is allways better than cure. Inguinal Hernias constitute majority of the Inguino scrotal swellings (97.62%). Hernia repair is the gold standard measure for training the residents in any hospital. Bassini's hernia repair is the basic on which many hernia repairs have been improved and improvised. The advent of mesh repair has come as a boon not only to the patients but also to the junior staff under training, as it required less dissection and with less associated complications.

Formation of hernia can be prevented by avoiding precipitating factors like smoking, factors that increases intraabdominal pressure such as enlarged prostate, chronic cough etc.

Right-sided inguinal swelling (65.55%) is commoner than left side (28.88%). Age is directly proportional to the occurrence of inguinal swelling. Irreducibility formed the commonest complications of inguino-scrotal swelling followed by obstruction and strangulation.

Post-operative wound infection was only 2.22%, groin pain in 2.22%, hematoma formation in 1.11%, scrotal swellings is 1.11% Recurrence in 1.11% following Herniorrhaphy.

Complications following resection and anastamosis followed by herniorrhaphy was the highest (40%) and resection and anastomosis followed by Herniorrhaphy was also high (33.33%).

Simple hernioplasty had the lowest (1.81%). Old aged people are more prone for complications if the hernia occurs after 5thdecade of life. Indirect Inguinal Hernia is more prone for complications than direct Inguinal Hernia. All cases of inguino-scrotal swellings should undergo early surgical treatment in order to prevent or reduce pre-operative and post-operative complications. Stoppa's procedure has comparable results for bilateral and recurrent hernias. Lichtensten's hernioplasty has least complications, able to ambulate early, return to work early and less post- operative pain, reduced incidence of chronic groin pain and least recurrence following surgery for unilateral uncomplicated hernias.

I humbly like to conclude my study by stating that Surgery is the treatment of choice for inguinal hernias.

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Cite This Article: Srinivasa Karthik Appa, Shiva Shankar Reddy, Banoth Balu (2023). Clinical Study of Inguinal Hernia Its Management at TRR Institute of Medical Sciences, Patancheru. *East African Scholars J Med Surg, 5*(2), 7-16