

**“A CLINICAL STUDY ON COMPLICATED HERNIAS PRESENTING
IN EMERGENCY WARD, TVMCH”**

A DISSERTATION SUBMITTED TO THE TAMILNADU

DR MGR MEDICAL UNIVERSITY

CHENNAI

In partial fulfillment of the requirement for the degree of

M.S. (GENERAL SURGERY)

BRANCH – I

Register No: 221711359



DEPARTMENT OF GENERAL SURGERY

TIRUNELVELI MEDICAL COLLEGE

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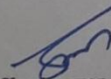
THE FOLLOWING DOCUMENTS WERE REVIEWED AND APPROVED

1. TIREC Application Form
2. Study Protocol
3. Department Research Committee Approval
4. Patient Information Document and Consent Form in English and Vernacular Language
5. Investigator's Brochure
6. Proposed Methods for Patient Accrual Proposed
7. Curriculum Vitae of The Principal Investigator
8. Insurance / Compensation Policy
9. Investigator's Agreement with Sponsor
10. Investigator's Undertaking
11. DCGI/DGFT approval
12. Clinical Trial Agreement (CTA)
13. Memorandum of Understanding (MOU)/Material Transfer Agreement (MTA)
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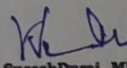
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INTRODUCTION

Schwartz et al defined hernias as a protrusion of a viscus through an opening in the wall of a cavity in which it contained¹. It occurs when aponeurosis and fasciae are devoid of the protecting support of striated muscle. Because of the anatomical relation, the commonest site of herniation is in the inguinal region, other sites include femoral, umbilical, paraumbilical, incisional, etc. The most common type among abdominal wall hernias are groin hernias which accounts for 75% of all. Of these, inguinal hernias account for 95%².

These hernias becomes complicated when it becomes irreducible, obstructed and subsequently progressed to strangulation. Gangrene occurs when the blood supply of its contents is seriously impaired. Obstructed external hernias are said to be the most common cause of intestinal obstruction³. Acute intestinal obstruction is one of the most common acute abdominal emergencies and is associated with significant morbidity and mortality, especially if it becomes strangulated. In all the age groups, it is one of the most common surgical emergencies. Early diagnosis and elective repair is a safe and effective strategy for patients of all ages that avoid incarceration, strangulation and their complications⁴. The accuracy in judging the severity of complicated groin hernias in a patient is of prime importance to follow the procedure of treatment. Surgery is a must with release of constricting band and if nonviable gut is present and resection is advised.

OBJECTIVES

This is a clinical study that determines the different presentation methods, clinical findings, diagnostic and therapeutic strategies and evaluates the postoperative outcome of complicated hernia surgeries in TVMCH.

REVIEW OF LITERATURE

ANATOMY OF THE ABDOMINAL WALL

INTRODUCTION

The incision and closure of the abdominal wall are among the most frequently performed surgical procedures. The abdominal wall is defined cranially by the xiphoid process of the sternum and the costal margins, and caudally by the iliac and pubic bones of the pelvis. It extends to the lumbar spine, which joins the thorax and pelvis and is a point of attachment for some abdominal wall structures⁵.

The integrity of the anterior abdominal wall is primarily dependent upon the abdominal muscles and their conjoined tendons. These muscles assist with respiration and control the expulsive efforts of urination, defecation, coughing, and parturition. They also work with the back muscles to flex and extend the trunk at the hips, rotate the trunk at the waist, and protect viscera by becoming rigid.

The contour of the abdomen is dependent upon age, muscle mass, muscle tone, obesity, intra-abdominal pathology, parity, and posture. These factors may significantly alter topography and become a major obstacle to proper incision selection and placement⁶. Knowledge of the layered structure of the abdominal wall permits efficient and safe entry into the peritoneal cavity.

There are nine layers to the abdominal wall

1. Skin
2. Subcutaneous tissue
3. Superficial fascia
4. External oblique muscle
5. Internal oblique muscle
6. Transversus abdominis muscle
7. Transversalis fascia
8. Preperitoneal adipose and areolar tissue
9. Peritoneum

Nerves, blood vessels, and lymphatics are present throughout.

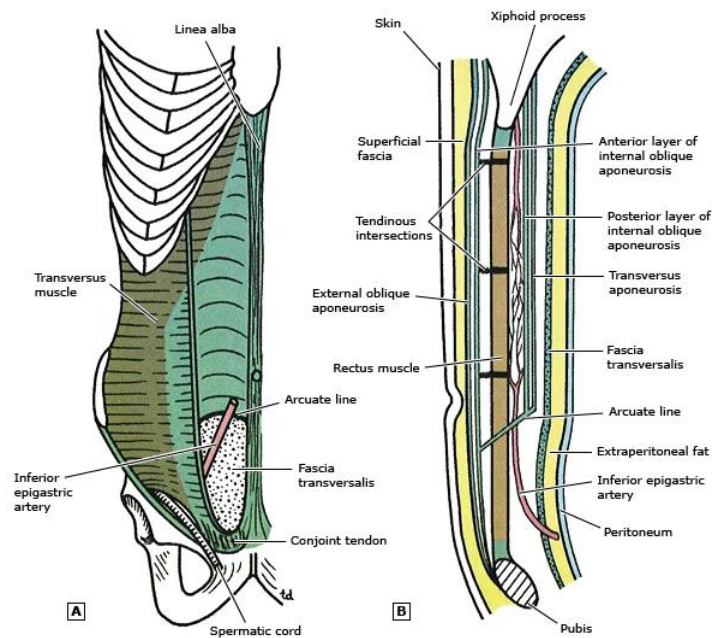


Figure 1 : Sagittal view of the layers of the abdominal wall

SKIN

The skin is the largest organ of the human body. It has numerous functions, including protection against mechanical injury, prevention of bacterial invasion, and protection from the effects of ultraviolet light. Skin is loosely attached to the underlying structures of the abdomen, with the exception of the umbilicus, where the skin is tethered firmly to underlying tissue. Skin lines of approximately equal tension are known as Langer's lines⁷.



Figure 2 : Langers lines of the abdomen

Across the abdomen, these lines are oriented in a predominately transverse direction with a gentle curvature. Langer's lines are associated with the distribution of collagen and elastic fibers in the skin⁸. Thus, transverse incisions heal with a narrower, more cosmetic scar because they are parallel to

Langer's lines and have less tension, while longitudinal or oblique incisions, which traverse these lines, may heal with a broader scar.

SUBCUTANEOUS TISSUE

The subcutaneous tissue is comprised of deep and superficial adipose tissue layers separated by weak, poorly defined fibrous tissue matrices. Camper's fascia is superficial and Scarpa's fascia is deep⁹. Camper's fascia is the superficial fatty layer that is continuous with superficial adipose and may vary in thickness, depending upon the patient's body habitus. Scarpa's fascia is a more membranous layer that will eventually become contiguous with the superficial fascia of the back, thorax, and fascia lata of the thigh. Inferiorly, this membranous layer also fuses in the midline and forms a tubular sheath for the penis or clitoris.

MUSCLES

The anterior abdominal wall consists primarily of the rectus muscles and associated fascia.

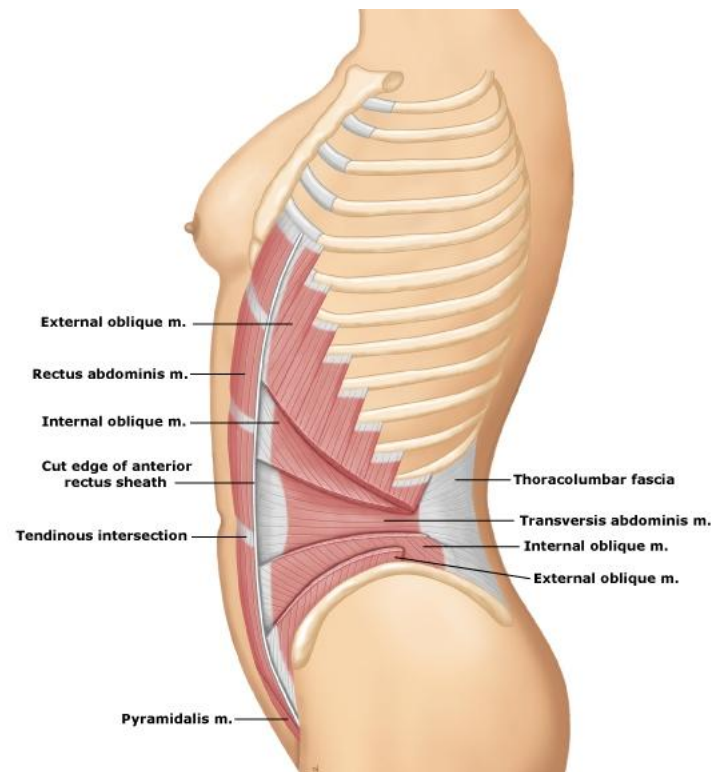


Figure 3 : Muscles of the lateral abdominal wall

The posterolateral, lateral, and remaining anterior portions of the abdominal wall are composed of three paired, broad, flat muscles, each with an aponeurosis or tendon including the external oblique, internal oblique, and transversus abdominis muscles. The rectus muscles are responsible for abdominal wall flexion, while the oblique muscles rotate the torso. The internal oblique and transversus abdominis muscles support and compress the abdominal contents.

RECTUS ABDOMINIS

The rectus abdominis consists of a pair of strap muscles that extend the length of the anterior abdominal wall and are separated by the linea alba.

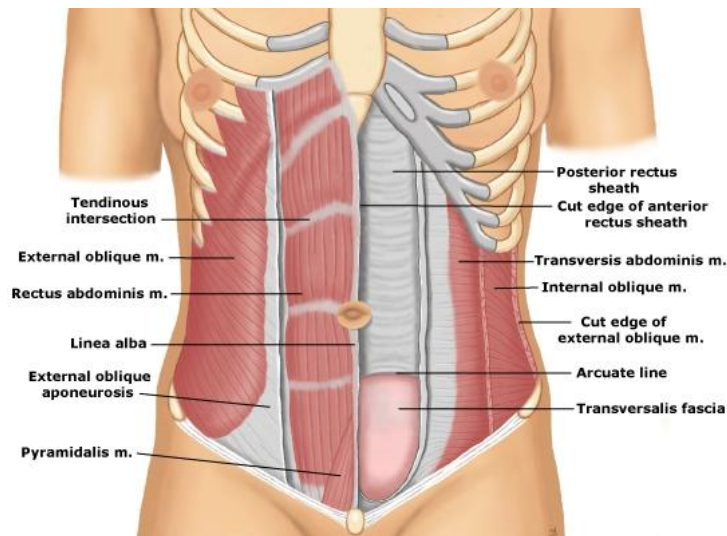


Figure 4 : Muscles of the anterior abdominal wall

These muscles arise from the symphysis pubis and the pubic crest with insertion into the fifth, sixth, and seventh costal cartilages and the xiphoid process. The rectus sheath has variable contributions from the oblique and transversus muscles.

EXTERNAL OBLIQUE

The external oblique muscle is a broad, thin muscle that arises from the surfaces of the lower eight ribs, fanning out downward to insert medially into the xiphoid process, the linea alba, and the anterior portion of the iliac crest. Its aponeurotic sheet contributes to the anterior sheath of the rectus abdominis, then fuses at the linea alba in the midline with the contralateral counterpart.

The remainder of the aponeurosis extends from the iliac spine to the pubic tubercle, where it becomes the inguinal ligament.

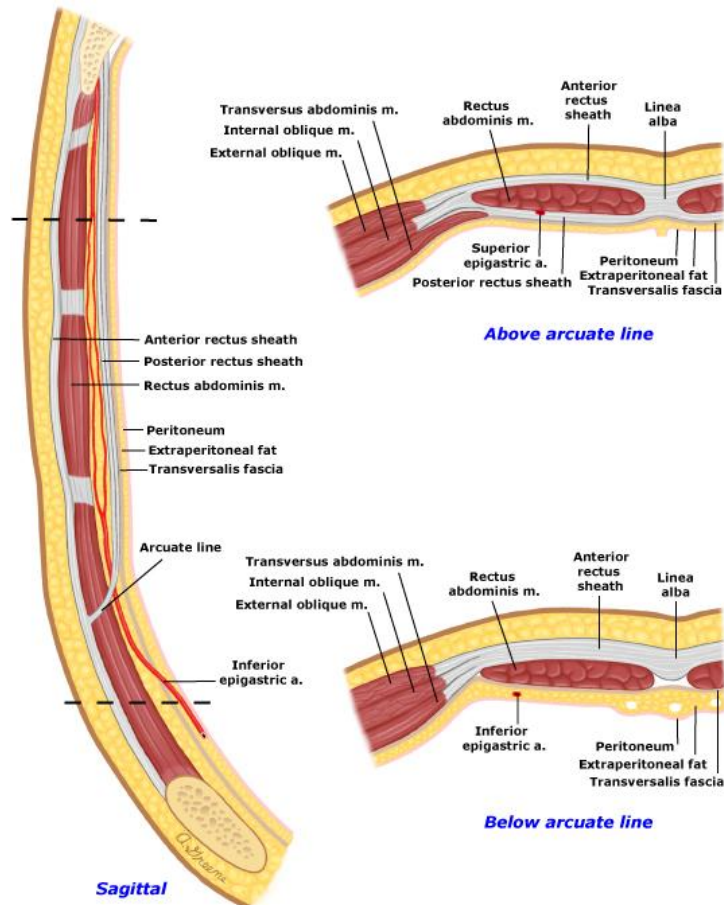


Figure 5 : Sectional view of the abdominal wall musculature

INTERNAL OBLIQUE

The internal oblique muscle is a broad, thin muscle that lies deep to the external oblique, with its origins from the thoracolumbar fascia, the anterior two-thirds of the iliac crest, and the lateral two-thirds of the inguinal ligament. The muscle fibers travel upward and forward to insert into the lower borders of the lower three ribs and their costal cartilages, the xiphoid process,

the linea alba, and the symphysis pubis. Above the arcuate line, its aponeurotic sheet contributes to both the anterior and posterior sheath of the rectus abdominis, then fuses at the linea alba in the midline with the contralateral counterpart. Below the arcuate line, the aponeurosis of the internal oblique muscle courses only anteriorly to the rectus abdominis muscle as part of the anterior rectus sheath.

TRANSVERSUS ABDOMINIS

The transversus abdominis muscle is a thin muscle sheet that lies deep to the internal oblique muscle. It arises from the deep surface of the lower six costal cartilages, lumbar fascia, iliac crest, and lateral third of the inguinal ligament and inserts into the xiphoid process, linea alba, and symphysis pubis. The fibers of this muscle sheet run horizontally and forward. Its aponeurotic sheet contributes to the posterior rectus sheath above the arcuate line and the anterior rectus sheath below the arcuate line. It then fuses at the linea alba in the midline with the contralateral counterpart.

PYRAMIDALIS

The pyramidalis muscle is a flat, triangular muscle at the inferior margin of the anterior abdominal wall. It originates from the superior pubic ramus, between the symphysis pubis and the pubic tubercle, and runs superomedially inserting into the linea alba. Most of the existing literature regarding this muscle focuses on whether or not it actually exists¹⁰.

FASCIA

RECTUS SHEATH

The rectus sheath is composed of the broad, sheet-like aponeuroses of the flank muscles that enclose the rectus abdominis (and pyramidalis muscle, if present).

Lateral to the rectus abdominis, the aponeuroses can be separated, but they fuse as they reach the midline. The external oblique muscle, the most superficial of the flank muscles, has a broad aponeurosis that passes anteriorly over the rectus abdominis. Beneath the external oblique, the internal oblique has a bilaminar aponeurosis that passes anterior and posterior to the rectus abdominis above the arcuate line, but only anterior to the rectus below the arcuate line. The innermost abdominal muscle is the transversus abdominis. Its aponeurosis is posterior to the rectus abdominis above the arcuate line and anterior to the rectus abdominis below the arcuate line where it fuses with the aponeurosis of the internal oblique.

Inferior to the arcuate line, the aponeuroses of all three muscles form the anterior sheath. The posterior sheath is absent and the rectus is positioned directly on top of the fascia transversalis. The arcuate line is the site where the inferior epigastric vessels enter the rectus sheath, travel superiorly, and converge with the superior epigastric vessels. In as many as 30% of people, the arcuate line is absent¹¹.

TRANSVERSALIS FASCIA

The transversalis fascia is a weak fibrous layer covering the inner surface of the transversus abdominis muscles and is separated from the peritoneum by a layer of fat, commonly known as the preperitoneal fat layer. It is frequently incised off the bladder when the peritoneal cavity is opened. This layer of connective tissue forms a continuous lining for the abdominal and pelvic cavities and is continuous with the diaphragmatic fascia, the iliacus fascia, and the pelvic fascia.

LINEA ALBA

The linea alba stretches from the xiphoid process to the pubic symphysis. It is defined as the fusion of the aponeuroses of the external oblique, internal oblique, and transversus abdominis muscles. This holds the abdominal musculature attached to each other. The linea tends to have its widest margin approximately 3 cm superior to the umbilicus and has varying distances depending upon the point of reference along the abdominal wall¹².

PERITONEUM

The peritoneum is a single serosa layer protected by a thin layer of connective tissue covering the abdominal cavity.

Five vertical folds are formed by underlying ligaments or vessels that converge at the umbilicus:

- the abdominal wall reflection of the bladder, which fuses with the urachus
- the single middle umbilical ligament (the obliterated urachus)
- the paired medial umbilical ligaments (remnants of the obliterated umbilical arteries)
- the lateral umbilical ligaments associated with the deep inferior epigastric vessels.

VASCULATURE

The blood supply of the abdominal wall is comprised of superficial and deep vascular supplies¹³.

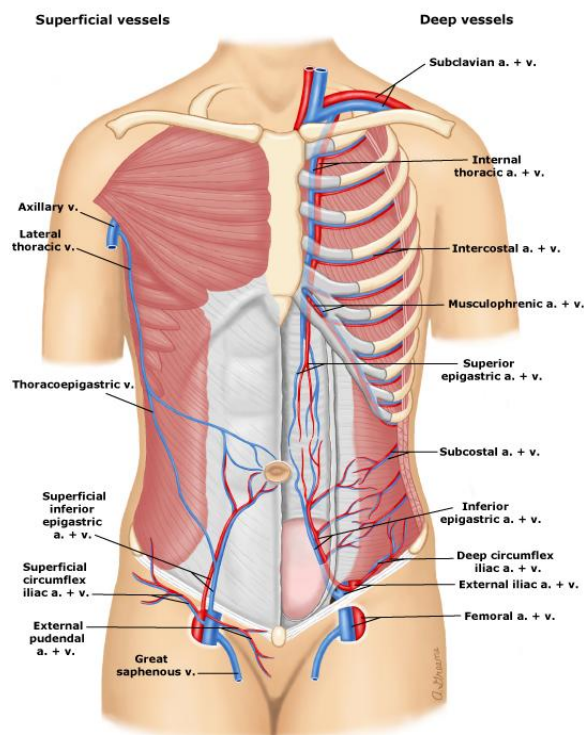


Figure 6 : Blood vessels of the anterior abdominal wall

These named vessels run primarily longitudinally and may provide collateral flow channels between the subclavian artery and femoral artery when significant aortic or bilateral iliac artery obstruction is present. The superficial vasculature is located in the subcutaneous tissues and supplies the tissues superficial to the external oblique aponeurosis and the anterior rectus sheath. The muscles and tissues below these layers are supplied by the deep vessels that are located in the musculofascial layers.

DEEP ARTERIES

INFERIOR EPIGASTRIC ARTERIES

The inferior epigastric artery is thought to be the dominant vascular supply to the anterior abdominal wall. It branches from the external iliac artery passing medially adjacent to the inguinal ligament. It ascends medial to the internal (deep) inguinal ring and superficial to the transversalis fascia. It then proceeds toward the umbilicus and crosses the lateral border of the rectus muscle at the arcuate line where it enters the posterior rectus sheath. Once the artery enters the sheath, it branches extensively. It ascends within the rectus sheath to communicate with the superior epigastric artery. The angle between the vessels and lateral border of the rectus forms the apex of the inguinal (Hesselbach's) triangle, the base of which is the inguinal ligament. The musculocutaneous perforating vessels of the inferior epigastric artery reach and supply deeper tissue as well as the integument of the anterior abdominal

wall. These perforators are particularly relevant in reconstructive surgery as an important supply for abdominal tissue flaps used.

The number, location, and course of these perforators are highly variable. The inferior epigastric vessels are bounded only by loose areolar tissue below the arcuate line. Trauma to this portion of the inferior deep epigastric artery may result in considerable hemorrhage. Because hematomas commonly dissect into the retroperitoneal space, large quantities of blood may be lost before outward evidence of hematoma is detectable.

SUPERIOR EPIGASTRIC ARTERIES

The superior epigastric artery is a terminal branch of the internal thoracic artery. It enters the rectus sheath at the seventh costal cartilage and descends on the posterior surface of the rectus muscle. The superior and inferior epigastric arteries freely anastomose with one another at the level of the umbilicus to provide a generous collateral circulation between the subclavian and external iliac arteries.

These vessels communicate laterally with the intercostals, subcostal, and lumbar arteries, as well as the ascending branch of the deep circumflex iliac artery.

Deep branches of this vessel supply the posterior rectus sheath and the peritoneum with muscular branches and anterior perforating branches supplying skin and subcutaneous tissues.

DEEP CIRCUMFLEX ILIAC ARTERIES

The deep circumflex iliac artery also branches from the external iliac artery or, less frequently, from a common origin that includes the inferior epigastric artery.

Its course is lateral and vertical behind the inguinal ligament. It then turns medially at the iliac crest, where it pierces the transversus abdominis muscle.

Between the transversus abdominis and internal oblique muscles, numerous connecting branches supply the lower and lateral abdominal wall. Anastomoses with the intercostal and lumbar vessels supply branches to all the flank muscles.

MUSCULOPHRENIC ARTERIES

The musculophrenic artery is also a branch of the internal thoracic artery. It lies behind the costal cartilage to supply the intercostal spaces and the upper abdominal wall. Anastomoses from intercostal and subcostal vessels to the deep circumflex iliac vessels occur in the deep layer.

SUPERFICIAL ARTERIES

The superficial vasculature of the abdominal wall is located in the subcutaneous tissues and consists of branches of the femoral artery, including the superficial epigastric (or superficial inferior epigastric), superficial external pudendal, and superficial circumflex arteries. The superficial epigastric vessels

run diagonally in the subcutaneous tissues from the femoral artery toward the umbilicus.

They can be identified on a line between the palpable femoral pulse and umbilicus just superficial to Scarpa's fascia. As they approach the umbilicus, the arteries branch extensively. The external pudendal arteries have a medial and diagonal course from the femoral artery and supply the region of the mons pubis.

These vessels branch extensively as they approach the midline. Following incision, bleeding is typically heavier here than in other subcutaneous areas of the abdomen.

The superficial circumflex iliac vessels proceed from the femoral vessels to the flank. The superficial vessels follow the general pattern of the deep vessels and arise from the iliac or femoral vessels. The exception is that the superficial inferior epigastric vessels have no superior counterparts.

VEINS

Venous drainage of the anterior abdominal wall tends to be more variable than arterial pathways; however, veins typically follow the course of arteries. A better understanding of venous drainage systems of the anterior abdominal wall is needed for better management of abdominal flaps. Above the umbilicus, they drain to the subclavian vessels, and below the umbilicus, they drain to the external iliac vessels. Veins may be dilated in patients with obstructed blood

flow through the liver and porta hepatis. They may also be engorged in patients with large pelvic masses.

COLLATERAL FLOW CHANNELS

Several patterns of collateral flow exist in the abdominal wall due to the extensive network of vessels supplying it. The principle blood vessels involved in this collateral circulation are the internal mammary, superior epigastric, intercostals, inferior epigastric, and external iliac. This network allows blood to bypass the occlusion of the aorta or iliac vessels and thus restore blood flow to the lower extremities. Case reports have described the worsening of lower extremity ischemia when transverse incisions of the abdomen disrupt the abdominal wall vessels¹⁴.

LYMPHATIC CHANNELS

Abdominal lymphatics generally follow the course of the abdominal veins. As a general rule, the channels of the upper abdominal wall, above the level of the umbilicus, drain primarily to the anterior axillary (ie, pectoral) lymph nodes and, to a lesser extent, to the internal mammary chain. Those of the lower abdomen, below the level of the umbilicus, drain to the inguinal nodes and then to the iliac chain of nodes. Lymphatics adjacent to the umbilicus drain toward the liver through the falciform ligament. Transverse incisions are likely to disrupt lymphatic drainage to some degree. This disruption may lead to tissue

swelling in the abdominal wall until collateral lymphatic drainage can be established.

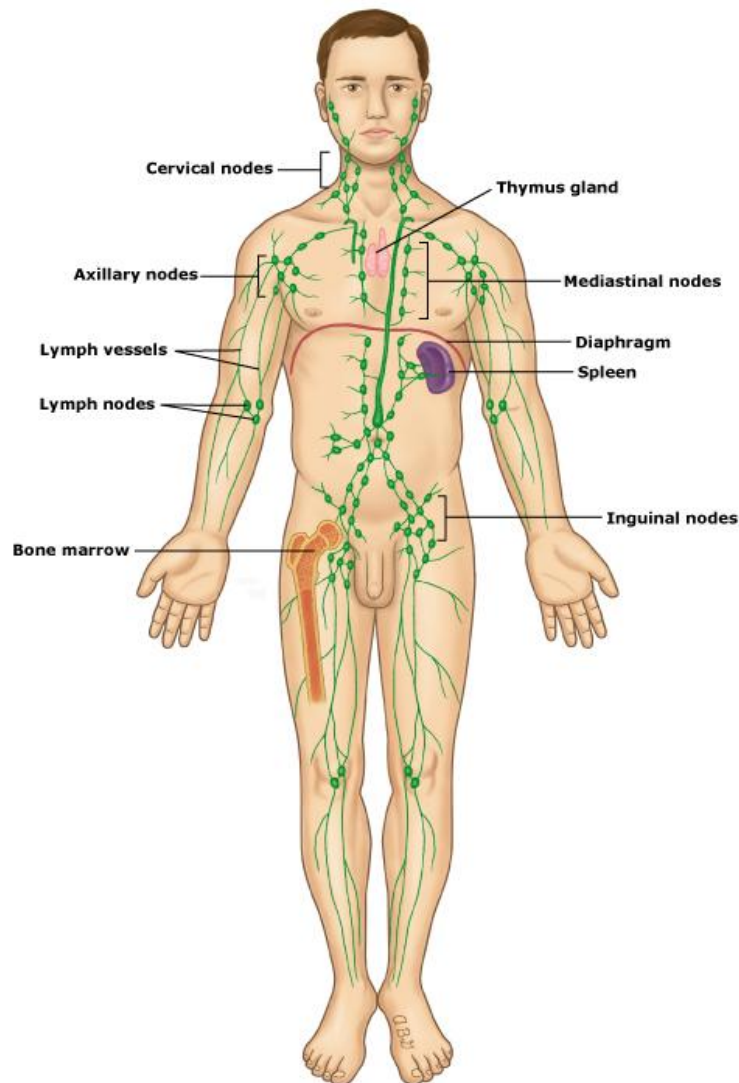


Figure 7 : Lymphatic system

NERVES

The intercostal and lumbar nerves enter the abdominal wall between the transversus abdominis and internal oblique muscles and run in a generally caudal and medial direction. Each nerve innervates a dermatome, but some overlapping innervation occurs. Longitudinal incisions (except at the midline)

can be expected to lead to sensory impairment inferior and medial to the level of the transected nerves. Although technically not nerves of the abdominal wall, the femoral nerve, the lateral femoral cutaneous nerve, and the genitofemoral nerve can also be damaged during abdominal surgery, especially with inguinal and femoral hernia repair.

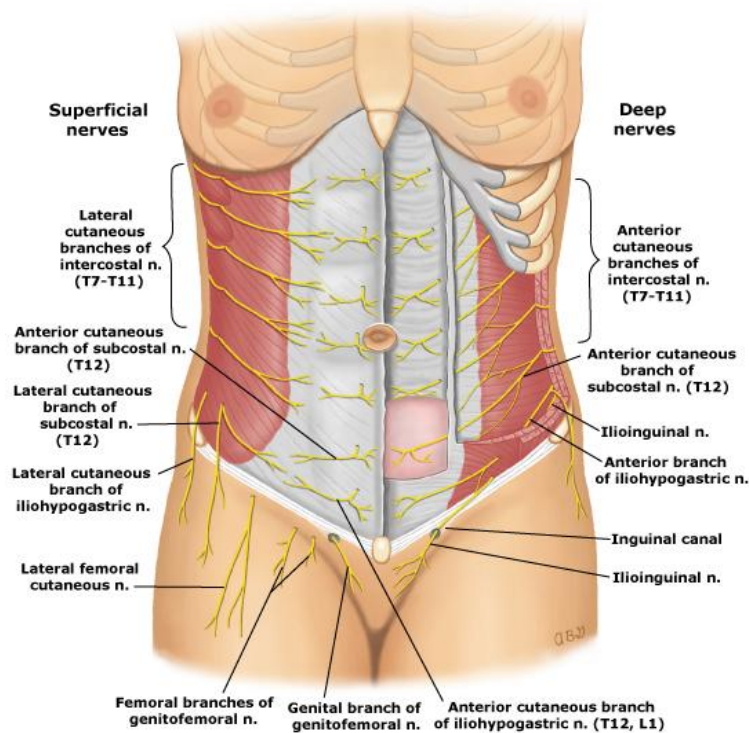


Figure 8 : Nerves of the abdominal wall

INTERCOSTAL NERVES

The 7th to 12th intercostal nerves innervate the abdominal wall.

Because of overlapping dermatomes, the fifth and sixth intercostal nerves can also contribute. The intercostal nerves divide into lateral cutaneous branches and anterior and posterior branches. The 10th nerve supplies the region of the umbilicus.

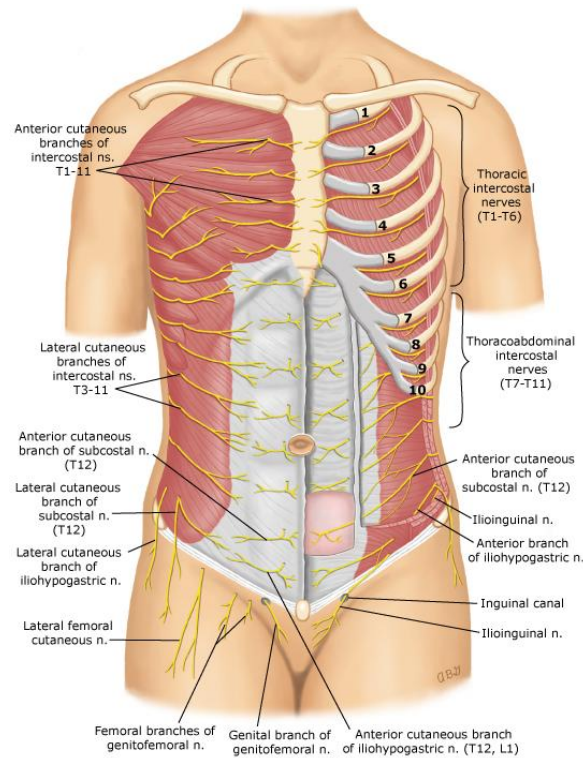


Figure 9 : Nerves of the anterior chest and abdomen

Postoperative bulge is related to intercostal nerve injury with subsequent paralysis of abdominal wall musculature. Intercostal nerve injury can be reduced by avoiding extension of the incision into the 11th intercostal space¹⁵.

ILIOHYPOGASTRIC NERVES

The 12th intercostal and the first lumbar nerves form the iliohypogastric nerve, which passes medial to the anterior superior iliac spine.

The iliohypogastric nerve enters the abdominal wall at the transversus abdominis muscle and courses, on average, 2 cm medial and 1 cm inferior to the anterior superior iliac spine, following a linear course to terminate approximately 4 cm lateral to the midline and 5 cm superior to the pubic symphysis¹⁶. The terminal branch courses medial and parallel to the inguinal

ligament. It provides motor fibers to the external oblique, internal oblique, and transversus abdominis muscles and provides sensory fibers to the skin of the mons pubis. The anterior cutaneous branch of the iliohypogastric nerve provides sensory innervation to the skin of the upper and lateral thigh¹⁷. It communicates with the ilioinguinal nerve and provides sensory fibers to the skin overlying the external inguinal ring and symphysis.

ILIOINGUINAL NERVE

The ilioinguinal nerve is formed by the combination of the first and second lumbar nerves and passes medial to the superior anterior iliac spine to supply the lower abdominal wall. On average, the proximal end of the ilioinguinal nerve enters the abdominal wall 3 cm medial and 4 cm inferior to the anterior superior iliac spine, then follows a linear course to terminate 3 cm lateral to the midline and 2 cm superior to pubic symphysis¹⁶.

The ilioinguinal nerve generally follows a course with the iliohypogastric nerve, running medially at the inguinal ligament between the transversus abdominis and internal oblique muscles. A branch of the ilioinguinal nerve accompanies the round ligament as it passes through the inguinal canal. It exits the canal at the external inguinal ring and provides sensory fibers to the labia majora and the upper aspect of the medial thigh¹⁷.

GENITOFEMORAL NERVE

The genitofemoral nerve has fibers from the first and second lumbar nerves and rests on the psoas muscle lateral to the external iliac artery. The genital branch provides sensation to the mons pubis and labia majora. The femoral branch provides sensation to the femoral triangle¹⁸. The genital branch passes within the cremasteric muscle fibers in men and in the round ligament in women and may be encountered during open hernia surgery.

LATERAL FEMORAL CUTANEOUS NERVE

The second and third lumbar roots give rise to this nerve, which crosses the psoas muscle slightly above the femoral nerve and provides sensory innervation to the anterior and lateral thigh¹⁹. It runs inferiorly and laterally toward the anterior superior iliac spine, exiting the pelvis through the lateral lacuna musculorum. It pierces the fascia approximately 2 to 3 cm below the anterior superior iliac spine.

Entrapment of the lateral femoral cutaneous nerve can occur, leading to numbness; paresthesias; and pain in the anterolateral thigh, a condition known as meralgia paresthetica.

INGUINAL HERNIA

INGUINAL CANAL²⁰

The inguinal canal is an oblique space measuring 4 cm in length and extending 2-4 cm above the inguinal ligament between the superficial and deep inguinal rings. Inguinal canal is a potential triangular cleft along the path of descent of testis between the two main musculoaponeurotic layers of the abdominal wall i.e. external oblique and the conjoined tendons of the internal oblique and transversus abdominis. It begins at the lateral margin of the deep inguinal ring and ends at the medial margin of the superficial inguinal ring. The canal is obliquely placed, appears triangular in cross-section and its courses from lateral to medial, deep to superficial and cephalad to caudal direction. The deep ring is a defect in transversalis fascia and lies about 1/2 an inch above mid-inguinal point; midway between anterior superior iliac spine and pubic symphysis. The spermatic cord is a collection of structures that traverse the inguinal canal and pass to and from the layers of the anterior abdominal wall. It is covered with three concentric layers of fascia derived from the layers of the abdominal wall.

BOUNDARIES OF THE INGUINAL CANAL

- The anterior wall is formed along its entire length by the aponeurosis of the external oblique muscle. It is reinforced in its lateral third by the fibers of origin of the internal oblique.

- The posterior wall of the canal is formed along its entire length by the fascia transversalis. It is reinforced in its medial third by the conjoint tendon, which is attached to the pubic crest and the pectineal line.
- The inferior wall or floor is formed by the rolled under the inferior edge of the inguinal ligament and at its medial end, the lacunar ligament.
- The superior wall or roof of the canal is formed by the lowest arching fibres of the internal oblique and transversus abdominis muscles.

INGUINAL LIGAMENT

The inguinal ligament²¹ is the folded inferior portion of external oblique aponeurosis that extends from anterior superior iliac spine to pubic tubercle. The fan-shaped medial expansion of the inguinal ligament is called the lacunar ligament. The iliopectineal arch, a thickening of the iliac fascia, anchors the inguinal ligament posteriorly and divides the space deeper to the inguinal ligament into muscular and vascular compartments. These are known as lacuna musculosa and lacuna vasculosa. The iliopsoas muscle passes from the pelvis to the thigh through the defect, lacuna musculosa. Lacuna vasculosa admits the passage of the iliac vessels just medial to the lacuna musculosa.

EPIDEMIOLOGY

Groin hernias (inguinal or femoral hernias) were the third leading cause of ambulatory care visits for gastrointestinal complaints. The prevalence of groin hernias is estimated to be between 5 and 10 percent in India. Inguinal

hernia is more common than femoral hernia and other abdominal wall hernias (eg, umbilical, epigastric). Although femoral hernias account for less than 10 percent of groin hernias, they present clinically with complications (incarceration, strangulation) more often than inguinal hernias. Hernias are more common in men compared with women. Men are eight times more likely to develop a hernia and 20 times more likely to need a hernia repair compared with women. The lifetime risk of developing a groin hernia is approximately 25 percent in men but less than 5 percent in women. Women manifest groin hernias at a later age. In one review, the median age at presentation was 60 to 79 years of age for women compared with 50 to 69 years of age for men. The peak age range at presentation for indirect hernia in women is 40 to 60 years of age. Groin hernias are classified anatomically as inguinal (indirect or direct) or femoral.

RISK FACTORS

- History of hernia or prior hernia repair (including childhood)
- Older age
- Male sex
- Caucasian race
- Chronic cough
- Chronic constipation
- Abdominal wall injury
- Smoking
- Family history of hernia

CLASSIFICATION AND PATHOGENESIS

Groin hernias can broadly be classified by etiology (congenital versus acquired) and anatomic location.

Congenital hernias typically occur in the groin, although they may be found in other locations such as the umbilicus or femoral canal.

The simplest and most common anatomic system separates groin hernias into direct and indirect inguinal hernias and femoral hernias.

ETIOLOGY

Hernias are classified by etiology depending upon whether the hernia is due to a congenital defect or is acquired. Congenital hernia is a result of abnormal development whereas acquired hernia is due to alterations of otherwise normally developed tissues that lead to weakening or disruption. Males and females exhibit differences in the anatomic development of structures in the groin, which impacts the nature of hernia each develops.

Congenital hernia

Congenital inguinal hernia is due to failure of the processus vaginalis to close. The processus vaginalis is an invagination of parietal peritoneum that precedes the migration and descent of the testicles in males. The same invagination occurs in females, and the portion of the processus vaginalis within the inguinal canal is called the "canal of Nuck," which usually obliterates around the eighth month of fetal life²².

- In males, the gubernaculum (caudal genital ligament) normally migrates through the internal inguinal ring into the inguinal canal and through the external ring into the scrotum to allow descent of the testicle.

Later in development, the upper portion of the gubernaculum degenerates and the lower portion remains as the scrotal ligament securing the testicle to the lower part of the scrotum, limiting its mobility²³.

Once the testicle has descended, the internal ring normally closes. Failure of the internal ring to close combined with failure of obliteration of the processus vaginalis provides the necessary defect through which abdominal tissues can pass (eg, small bowel, caecum), which can occur during childhood or not until adulthood.

- In females, migration of the gubernaculum does not take place²⁴.

The upper portion of the gubernaculum in females forms the suspensory ligament of the ovary; the lower portion of the gubernaculum is bent into an angular form.

Cephalic to the bend, it becomes the round ligament of the ovary (ie, ligamentum ovarii proprium) and caudal to it, the round ligament of the uterus (ie, ligamentum teres uteri). Thus, the inguinal component of the gubernaculum remains in females as the round ligament, whereas it degenerates in males. The round ligament runs through the internal ring, through the inguinal canal, and ends in the fat of the labium majora or terminates just outside the external ring without attachment or extension to the labium²⁵. The internal ring is narrower in

women and may explain the lower incidence of indirect inguinal hernia in women. The ligamentous structure found within the inguinal hernia sac in female patients is often erroneously identified as the round ligament. However, detailed anatomic examination identifies this structure as the suspensory ligament of the ovary, which helps explain the occasional presence of the fallopian tube or ovary in the hernia sac in female patients.

ACQUIRED HERNIA

Acquired hernias are due to a weakening or disruption of the fibromuscular tissues of the body wall allowing intra-abdominal contents to protrude through the acquired defect. Acquired groin hernias can develop as a result of inherent connective tissue abnormalities, chronic abdominal wall injury, or possibly drug effects²⁶. Tissues of the groin may disrupt as a result of inborn or acquired biochemical or metabolic processes that weaken connective tissue due to disturbed collagen metabolism²⁷. A tendency toward hernia formation may be evident in the patient or family history. Aortic aneurysmal disease, which is linked to connective tissue abnormalities, is also associated with groin hernia. Although rare, a number of inborn errors of metabolism, such as abnormalities in collagen type I and III synthesis, can be the underlying cause for the development of hernias.

Weakening of the tissues may also result from pharmacologic effects.

Chronic glucocorticoid administration is associated with thinning of skin and weakening of the soft tissues that may predispose to hernia development.

Other factors that affect the integrity of connective tissue include older age and smoking. Chronic overstretching of the musculoaponeurotic structures due to increased intra-abdominal pressure or abdominal wall injury is another factor contributing to acquired hernia. Elevations in intra-abdominal pressure can also result from chronic cough, constipation, strenuous exercise/activity, and pregnancy. Direct hernias occur with unusual frequency in athletic individuals.

The relationship between inguinal hernias and intermittent straining or heavy lifting is not clear; some studies suggest that the incidence of hernia is no higher in professions performing heavy manual labor than in sedentary professions, while others have come to the opposite conclusion. Pectineus muscle atrophy with age may contribute to femoral hernia formation. The higher incidence of femoral hernia in women may relate to comparatively less baseline muscle bulk compared with men, or a weakening of the musculature from childbirth. However, in one small study, multiple deliveries were not found to be significantly associated with the development of hernia in women.

ANATOMIC LOCATION

Groin hernias are classified according to the anatomic location of the abdominal wall defect. Several classification schemes for groin hernias exist²⁶, but the simplest and most useful system identifies groin hernias by the anatomic site of the tissue defect separating groin hernias into indirect and direct inguinal hernias and femoral hernias.

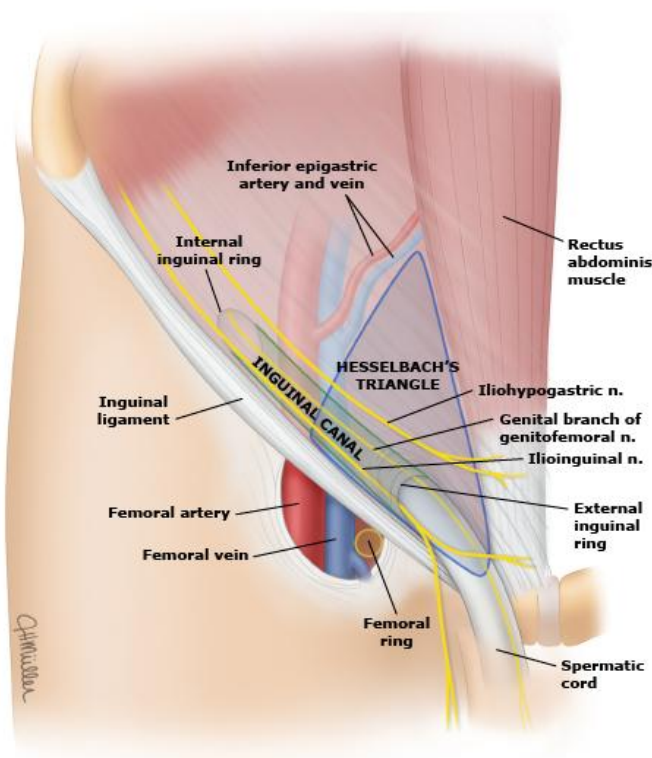


Figure 10 : Inguinal canal

INDIRECT INGUINAL HERNIA

Indirect inguinal hernias are the most common type of hernia in males and females. Indirect hernias protrude at the internal inguinal ring, which is the site where the spermatic cord in males and the round ligament in females exits the abdomen.

The origin of the hernia sac is located lateral to the inferior epigastric artery. Indirect hernias develop more frequently on the right in both sexes, which is thought to be due, in males, to a later descent of the right testicle and, in females, to the asymmetry of the female pelvis. Most indirect inguinal hernias in adults are congenital, even though they may not be clinically apparent in the neonatal period or childhood. A shutter mechanism, which is postulated to close the internal inguinal ring to a slit, may be dysfunctional in patients with a patent processus vaginalis²⁸. Increases in intra-abdominal pressure in association with reduced muscle tone or other connective tissue abnormalities can then force abdominal contents through the widened internal ring into the inguinal canal, resulting in a clinically detectable hernia.

DIRECT INGUINAL HERNIA

Direct inguinal hernias protrude medial to the inferior epigastric vessels within Hesselbach's triangle, which is formed by the inguinal ligament (Poupart's ligament) inferiorly, the inferior epigastric vessels laterally, and the rectus abdominus muscle medially.

Direct inguinal hernias occur as a result of a weakness in the floor of the inguinal canal. This weakness appears to be due to connective tissue abnormalities in many cases, although some may occur due to deficiencies in the abdominal musculature resulting from chronic overstretching or injury.

COMPLICATIONS OF INGUINAL HERNIA

PATHOLOGICAL CLASSIFICATION / CLINICAL CLASSIFICATION

1. REDUCIBLE HERNIA²⁹

Normally an uncomplicated hernia is reducible. Its contents can be returned into the abdominal cavity, but sac remains in position; especially in lying down position. Intestine reduces with gurgling and it is difficult to reduce the first portion. Omentum is doughy, granular and difficult to reduce the last portion. Expansile impulse on coughing present.

2. IRREDUCIBLE HERNIA³⁰

Here contents cannot be returned to the abdomen;

various causes are:

- narrow neck due to fibrosis
- adhesions between the contents, between sac and contents, between two portions of sac
- overcrowding of contents
- sliding hernia
- deposition of fat in the omentum
- very large scrotal hernia (scrotal abdomen).

Irreducibility predisposes to strangulation. Cough impulse absent, severe dragging type of pain present over the swelling. Femoral hernia is often irreducible.

3.OBSTRUCTED OR INCARCERATED HERNIA (IRREDUCIBILITY + OBSTRUCTION OF INTESTINE)³¹

It is an irreducible hernia with obstruction of lumen of intestine, but blood supply to the bowel is not interfered. It eventually leads to strangulation. The term incarcerated hernia should be employed only when it is considered that the lumen of that portion of the colon occupying the hernial sac is blocked with faeces. In that scybalous contents of bowel should be capable of being indented with finger.

4. STRANGULATED HERNIA³²

It characterized by irreducibility, intestinal obstruction and arrest of blood supply to the contents; ultimately the content becomes gangrenous. Intestinal obstruction may not be presenting omentocele, Richter's and Littre's hernia. Although inguinal hernia is four times more commoner than femoral hernia, yet a femoral hernia is more likely to be strangulated as the femoral ring is quite tough and narrow in comparison to superficial inguinal ring.

CLINICAL FEATURES³³

Patient first complains of pain and vomiting, pain particularly located at the hernial site. In case of internal strangulation it is located at the umbilicus. Soon pain spreads all over the abdomen and vomiting becomes forcible and frequent. If the strangulation is not relieved, the paroxysm of pain continues.

Such pain will only cease with the onset of gangrene and paralytic ileus. So in strangulated hernia, spontaneous cessation of pain is an ominous symptom.

On examination, the patient appears seriously ill. The hernia is tense, tender, irreducible and there is no impulse on coughing. There are also features of intestinal obstruction in case of enterocele.

Classic signs of strangulation – tachycardia, fever, leucocytosis, constant non-cramping abdominal pain, septic shock, oliguria or anuria, azotemia, ventilatory disturbances, CNS manifestations. In strangulated omentocele, vomiting and pain are not severe, there will not be intestinal obstruction. As the omentum can withstand meagre blood supply for quite a long time, onset of gangrene is usually delayed. It first occurs in the most distal part of omentum. Once the gangrene sets, the mass gets infected and becomes an inflamed hernia with strangulation.

Strangulation progresses in three stages:

- viable gut
- non-viable gut
- gangrenous gut

OPERATIVE PROCEDURES

OPERATIVE PRINCIPLES OF HERNIORRHAPHY

Many principles and specific surgical maneuvers are common to all the operations.

These common elements are:

- Initial incision
- Mobilization of the cord structures
- Division of the cremaster muscle
- High ligation of the sac
- Relaxing incision
- Wound closure

BASSINI'S REPAIR³⁴

The main aim is to strengthen the posterior wall of the inguinal canal by stitching the lower margin of the muscles (internal oblique and transversus) and the conjoined tendon to the inner margin of the inguinal ligament behind the cord. Three to five interrupted stitches applied with non-absorbable suture material.

LICHTENSTEIN REPAIR

To obtain exposure for Lichtenstein inguinal hernia repair³⁵

- Incise the skin over the inguinal canal and angle slightly cephalad as the incision progresses laterally.

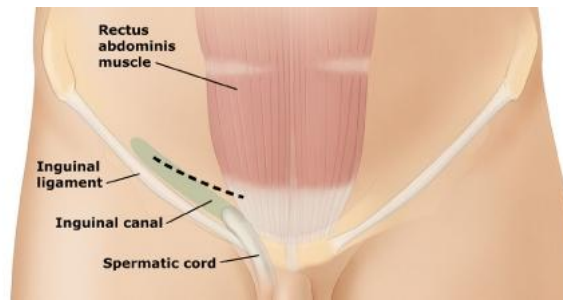


Figure 11 : Inguinal incision

- Divide the subcutaneous layer and ligate the superficial epigastric vein. Sharply dissect the subcutaneous tissue from the external oblique aponeurosis to expose the external inguinal ring. Incise the aponeurosis of the external oblique muscle in the direction of its fibers extending laterally from the external inguinal ring. Take care to protect the ilioinguinal nerve, which frequently lies in proximity to the undersurface of the external oblique muscle in this area. The incision should expose the internal oblique muscle as it engages the inguinal ligament laterally, which allows clear identification of the ilioinguinal nerve between the internal and external oblique muscles before it joins the other cord structures more medially. This facilitates protection of the nerve during dissection and subsequent fixation of mesh laterally.
- In men, dissect the spermatic cord from the underlying transversalis fascia in the region of Hesselbach's triangle and retract it. In creating a window deep to the spermatic cord, protect the underlying transversalis fascia by first dissecting medially in the area of the pubic tubercle.

- In women, the procedure can be altered slightly by removing the segment of the round ligament lying within the inguinal canal along with the indirect hernia sac. This eliminates the need to keyhole the mesh.
- If a direct hernia is present and of sufficient size that it obscures the operative field, place a purse string stitch at the base of the direct hernia in the transversalis fascia, invert the attenuated fascia, and tie the purse string. Reinforce the purse string with a figure-of-eight stitch. This maneuver inverts the direct sac and facilitates exposure during additional dissection and mesh placement.
- Explore the spermatic cord for an indirect hernia sac or cord lipoma. The cord should not be routinely "skeletonized" because testicular ischemia can result. Even so, removal of redundant cremaster and fat may be required to facilitate repair. Remove the indirect sac and close the peritoneum at the level of the internal ring. Alternatively, it is acceptable to free the sac at the internal ring and place it within the adjacent preperitoneal space. If the neck of the hernia sac neck is large, a running closure or purse string suture may be needed. Smaller necks can be transfixed.
- Fashion a patch of polypropylene mesh to cover the inguinal region from a sheet of the chosen mesh product. Tailor its shape and size to the patient's anatomy, leaving at least 2 cm of overlap on the pubic tubercle and anterior rectus sheath medially.

- Suture the inferior margin of the mesh with a running nonabsorbable suture (eg, 2-0) to the shelving edge of the inguinal ligament. Start at the pubic tubercle medially and run it laterally to a point that is at least 1 cm lateral to the insertion of the internal oblique muscle into the inguinal ligament.
- Similarly, suture the superior margin of the mesh to the rectus sheath medially and internal oblique muscle laterally to the point at which the internal oblique meets the inguinal ligament.
- Slit the lateral aspect of the mesh to encircle the spermatic cord, and reconstruct the internal ring by suturing the medial tail to the lateral tail and the inguinal ligament at a point lateral to the internal ring. This suture is placed in such a fashion that the "neo-internal ring" will just admit the tip of the needle driver alongside the spermatic cord.
- This "neo-internal inguinal" ring is slightly medial to the true internal ring, creating obliquity to the cord in the inguinal canal, which may help prevent recurrence of indirect hernias.
- In women, if the round ligament has been removed with an indirect sac, the need to slit the mesh is eliminated.

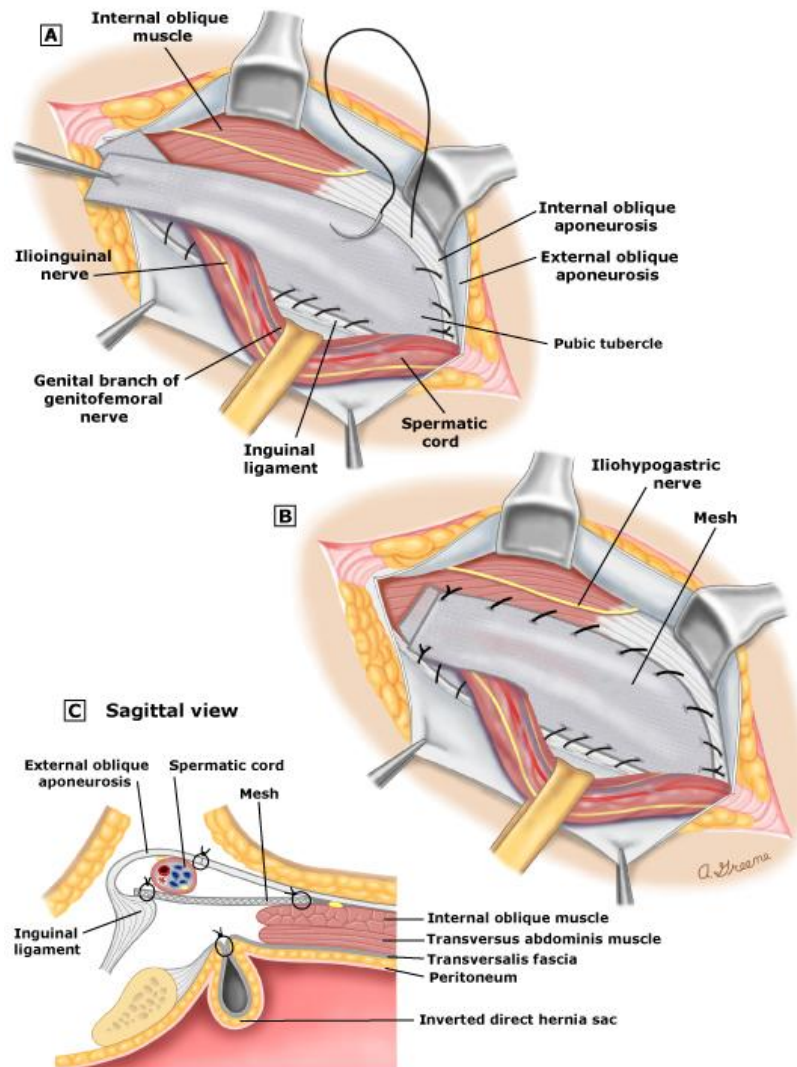


Figure 12 : Lichtenstein inguinal hernia repair

The key technical points in mesh placement are³⁶

- Medially, the pubic tubercle must be covered with mesh.
- The lateral extent of the mesh must cover the arch of the internal oblique as it extends laterally past the conjoint tendon (the fused aponeuroses of the internal oblique and transverse abdominis) to insert on the inguinal ligament.
- Sutures must not entrap the ilioinguinal, iliohypogastric, or genital branch of the genitofemoral nerves.

- The tails of the mesh should be sutured together lateral to the spermatic cord to avoid recurrence lateral to the internal ring.
- Interrupted suture may be favored when continuous sutures across the oblique internal muscle put nerves at risk of trapping.
- The lower edge of mesh must be in apposition to the inguinal ligament from the pubic tubercle medially to at least 1 cm past the edge of the internal oblique muscle laterally.
- The upper edge of mesh must cover a generous portion of the anterior rectus sheath medially and the internal oblique muscle over the upper edge of Hesselbach's triangle.
- There must be no tension on the mesh.
- The anatomic margins for mesh attachment must be clearly identified by clearing all fat, which sometimes requires cauterizing vessels that lie within the loose connective tissue in the area of the pubic tubercle.

FEMORAL HERNIA

The iliac artery and vein pass below the inguinal ligament to become the femoral vessels in the leg. The vein lies medially and the artery just lateral to the artery with the femoral nerve lateral to the artery. They are enclosed in a fibrous sheath. Just medial to the vein is a small space containing fat and some lymphatic tissue (node of Cloquet). It is this space which is exploited by a femoral hernia. The walls of a femoral hernia are the femoral vein laterally, the inguinal ligament anteriorly, the pelvic bone covered by the iliopectineal ligament (Astley Cooper's) posteriorly and the lacunar ligament (Gimbernat's) medially. This is a strong curved ligament with a sharp unyielding edge which impedes reduction of a femoral hernia.

The female pelvis has a different shape to the male, increasing the size of the femoral canal and the risk of hernia.

In old age, the femoral defect increases and femoral hernia is commonly seen in low-weight, elderly women. There is a substantial risk of developing a femoral hernia after a sutured inguinal hernia repair.

DIAGNOSIS OF FEMORAL HERNIA

The hernia appears below and lateral to the pubic tubercle and lies in the upper leg rather than in the lower abdomen. The hernia often rapidly becomes irreducible and loses any cough impulse due to the tightness of the neck. It may only be 1–2cm in size and can easily be mistaken for a lymph node. As it

increases in size, it is reflected superiorly and becomes difficult to distinguish from a medial direct hernia, which arises only a few centimetres above the femoral canal. A direct inguinal hernia leaves the abdominal cavity just above the inguinal ligament and a femoral hernia just below

INVESTIGATIONS

In routine cases, no specific investigations are required. However, if there is uncertainty then ultrasonography or CT should be requested. In the emergency patient, bowel obstruction usually occurs and a plain radiograph is likely to show small bowel obstruction

SURGERY

There is no alternative to surgery for femoral hernia and it is wise to treat such cases with some urgency³⁷. There are three open approaches³⁸ and appropriate cases can be managed laparoscopically.

LOW APPROACH (LOCKWOOD)

This is the simplest operation for a femoral hernia but suitable only when there is no risk of bowel resection. It can easily be performed under local anaesthesia. A transverse incision is made over the hernia. The sac of the hernia is opened and its contents reduced. The sac is also reduced and non-absorbable sutures are placed between the inguinal ligament above and the fascia overlying the bone below. A small incision can be made in the medial lacunar ligament to

aid reduction but there may be an abnormal branch of the obturator artery just deep to it, which can bleed. The femoral vein, lateral to the hernia, needs to be protected. Some surgeons place a mesh plug into the hernia defect for further reinforcement.

THE INGUINAL APPROACH (LOTHEISSEN)

The initial incision is identical to that of Bassini's or Lichtenstein's operation into the inguinal canal. The spermatic cord (or round ligament) is mobilised and the transversalis fascia opened from deep inguinal ring to the pubic tubercle. A femoral hernia lies immediately below this incision and can be reduced by a combination of pulling from above and pushing from below. If necessary, the peritoneum can be opened to help with reduction. Once reduced, the neck of the hernia is closed with sutures or a mesh plug, protecting the iliac vein throughout. The layers are closed as for inguinal hernia and the surgeon may place a mesh into the inguinal canal.

HIGH APPROACH (McEVEDY)

This more complex operation is ideal in the emergency situation where the risk of bowel strangulation is high. It requires regional or general anaesthesia. A horizontal incision (classically vertical) is made in the lower abdomen centred at the lateral edge of the rectus muscle. The anterior rectus sheath is incised and the rectus muscle displaced medially. The surgeon proceeds deep to the muscle in the preperitoneal space. The femoral hernia is

reduced and the sac opened to allow careful inspection of the bowel, and a decision made regarding the need for bowel resection. In dubious cases, the bowel is replaced into the peritoneal cavity for 5 minutes and then re-examined. The femoral defect is then closed with sutures, mesh or plug. This approach allows a generous incision to be made in the peritoneum, which aids inspection of the bowel and facilitates bowel resection

UMBILICAL HERNIA

CLASSIFICATION OF UMBILICAL HERNIA

Umbilical hernias can be classified into:

I. Infantile/congenital umbilical hernia³⁹

- Congenital umbilical hernia (Exomphalos) (Omphalococle), is caused by a failure of part of midgut to return to the abdominal cavity from the extra embryonic coelom during foetal life.

II. True acquired umbilical hernia of adult⁴⁰

- A true umbilical hernia is a protrusion of the abdominal contents through the centre of the umbilical cicatrix, usually due to predisposing factors like refractory ascites (chronic liver disease), repeated prolonged labour, obesity, chronic ambulatory peritoneal dialysis.

AETIOLOGY OF UMBILICAL HERNIA

I. Congenital

II. Acquired

I. Congenital

When the umbilical cord is ligated at birth, the arteries and vein thrombose. The umbilical ring continues to contract by scar tissue. If this process is halted before complete closure of the umbilical ring, an umbilical hernia results.

If bowel or omentum prolapse through the incompletely closed umbilicus before or after birth, an umbilical hernia is formed.

The hernia opening may vary from a few millimeters to 4cm.

II. Acquired

It is said that 10% adults with an umbilical hernia have a history of umbilical hernia in childhood.

Acquired factors may be classified into

1. Predisposing factors
2. Contributory factors.

Predisposing Factors

- In infants, improper ligation of the cord.
- Umbilical sepsis.
- Increased intra abdominal pressure such as coughing, straining, abdominal distension.

Contributory factors

- Low birth weight
- Race
- Sex
- Obesity
- Multiparity
- Associated conditions

PATHOLOGY OF UMBILICAL HERNIA

An umbilical hernia consists of:

1. The sac
2. Coverings of the sac.
3. Contents of the sac

The Sac

This is a peritoneal pouch protruding out through the abdominal wall.

- It consists of

1. the opening of the sac which is relatively narrow compared to the size of the sac.
2. the neck of the sac which is the most constricted part and the thinnest part.
3. the body of the sac.
4. Fundus : The most redundant part of the sac.

Coverings of the Sac

These are the layers of the abdominal wall which in case of umbilical hernia is the stretched out skin.

Contents of the Sac

The viscus which is within the sac are the contents.

- Smaller hernias usually contain only some omentum, but transverse colon, loops of small bowel, stomach can enter as hernia grows.

These hernias frequently become incarcerated and irreducible because of adhesions between the loops of bowel, omentum and the sac.

- Very rarely contents like ovarian cyst, mesenteric cyst, gravid uterus have been noted.

MANAGEMENT

Before elective surgery weight reduction is beneficial. In smaller adult umbilical hernias, a subumbilical incision can be used, but large hernias, and particularly incarcerated hernias, often require a large incision that may be either transverse or vertical. Dissection is carried around the hernia sac through the subcutaneous tissue down to the aponeurotic layer above, below and on the sides of the sac. The entire mass of skin, fat and hernia is elevated while the neck of the sac is incised because adhesions of the underlying omentum or bowel are more likely at the fundus. Concomitant buttonhole defects are also frequently present and the fascial bridges should be divided to create a single fascial defect. After the contents are dealt with and reduced the redundant sac should be excised and, if possible, the peritoneum closed with absorbable sutures. Ideally, the fascial defect should be repaired by primary suture with non absorbable sutures and edge-to-edge closure performed in either the transverse or the vertical direction, whichever is appropriate. It may not be possible to oppose the fascial edges in large hernias without undue tension, and in these

cases the defect should be repaired with a prosthetic mesh⁴¹ placed anchored circumferentially beneath the aponeurotic layer.

Complications include the development of seroma (especially when prosthetic mesh is used), hematoma, and infection. Meticulous attention to hemostasis and the use of suction drains may help to reduce these complications.

PARA UMBILICAL HERNIA

Defined as midline hernia abutting on the umbilicus superiorly and inferiorly are called Para umbilical hernia.

The hernia sac does not protrude through the umbilical scar, but through the linea alba in the region around the umbilicus.

Paraumbilical hernia is more common after the age of 35 years and is 5 times more common in women than in men.

These lesions are the result of defects in the linea alba and the umbilical fascia⁴².

The most common site is in the supraumbilical linea alba, but defects can also occur below the umbilicus.

They may occur in association with umbilical hernias and can be multiple, especially when associated with diastasis recti. Paraumbilical hernias do not resolve spontaneously.

CLINICAL FEATURES

The most common presenting symptom is pain (possibly caused by dragging on the fat and peritoneum of the falciform ligament), with or without a lump being present. The incidence of complications such as incarceration, inflammation and gangrene, is much higher than for true umbilical hernias. Due to the difference in natural history, these hernias must be distinguished from umbilical hernias. In the supra umbilical hernia, about half of the fundus of the sac is covered by the umbilicus, and the skin of the abdomen immediately above the umbilicus covers the remainder. This is in contrast to the umbilical hernia, in which the protrusion is directly under the umbilicus with a circumferentially symmetric bulge. In addition, paraumbilical hernias have no collar of fibrous tissue at the neck. If the hernia is small, the diagnosis can be assisted by standing the patient erect and tracing the linea alba with one finger's pulp. The paraumbilical hernias may be felt as a small, palpable nodule, often tender, just above or below the umbilicus.

DIAGNOSIS

Normally, radiological imaging is not needed to help treat hernias. Clinical examination usually makes an accurate diagnosis. However, herniorraphy, USG, CT and MRI scan are all established and accepted investigations for imaging hernias in cases of diagnostic uncertainty.

COMPLICATIONS OF PARAUMBILICAL HERNIA

- Skin irritation and infection

It is very common. Infection can occur in umbilicus itself due to accumulation of dirt and concretion. It can also occur in the fold of pedunculous belly due to constant sweat and mechanical irritation.

- Irreducibility

Most of the paraumbilical hernias are irreducible. This is due to loculation within the sac and omental adhesions with sac.

- Incarceration

The most frequent complication of umbilical hernia is incarceration with or without strangulation, both are extremely rare in infants and children.

- Obstruction and strangulation

Adults have a 10% rate of obstruction or strangulation. previously reducible or partially reducible can go for obstruction and strangulation. Strangulation is a common complication in adults of a large paraumbilical hernia, owing to the narrow neck and fibrous edge of the linea alba. Gangrene may be supervened if it is not done early. In large hernias, the presence of loculi may result in a strangulated knuckles of the bowel in one part of an otherwise soft and non-tender hernia. Chance of obstruction is more in female patients and female:male ratio is 6:1. Women who are pregnant are at greater risk.

- Perforation - it is rare.
- Intertrigo - this can be seen in large pedunculous umbilical hernias
- Faecal fistula

MANAGEMENT

Surgical repair is always indicated because these hernias do not resolve spontaneously. For solitary lesions separated from the umbilicus, the traditional incision is horizontally directly over the hernia. The incision is carried down through the subcutaneous fat and the fascial margins dissected out circumferentially around the protruding fat. The fascial defect is then either vertically or horizontally closed, depending on the orientation of the defect and the direction that produced least tension. Mattress sutures of non absorbable material of appropriate size are used. The subcutaneous tissue is then opposed with absorbable sutures and the skin closed with a subcuticular suture.

Examining the entire linea alba is important by placing a finger through the defect and palpating the fascia up to the xiphoid process. If multiple fascial defects are present, a vertical midline incision encompassing all of the defects is advised.

INCISIONAL HERNIA

PATHOLOGIC ANATOMY OF INCISIONAL HERNIA

A hernia may develop in any abdominal incision⁴³.

The initial step in its formation is the escape of omentum through the peritoneal suture line into muscular layer or even subcutaneously.

The hernial defect may vary in size since the original incision may have been a short one or all or only part of a long incision may have failed to heal.

Several defects may exist along one incision, making for multiple hernias in one scar. The sac being created secondarily either from serosa of omentum or by outgrowth from the edges of peritoneal gap.

The sac is often quite large and long and multioculated, even with small hernial defects. It protrudes forward, downward, and to the sides, burrowing into the subcutaneous fat, and may even overhang the pubis and thighs. These hernias may reach enormous proportions and constitute a serious surgical challenge. The hernia may contain omentum transverse colon, loops of small bowel and even stomach. Adhesions between the contents and the sac wall are common and may be responsible for the hernia's being incarcerated and irreducible

COMMONLY USED ABDOMINAL INCISIONS:

1. **Midline incision:** Commonly used incision for exposure in a wide variety of intra abdominal procedures. No muscle function, blood supply or nerve supply is disturbed. Affords good access to upper abdominal viscera and it is very quick to make and to close so that it is unsurpassed when speed is essential. It can also be extended and has the advantage of being able to reused again and again. It is particularly useful in the presence of peritoneal contamination since tissue exposed is minimized.
2. **The gridiron incision:** This incision for appendectomy is an elegant example of utilizing the muscle tension to achieve a secure wound closure that has stood the test of time. The sutures of the muscles are placed across the fibers and contraction of the muscles serves to tighten the closure rather than pull it apart.
3. **Kocher's sub-costal incision:** A right sub-costal incision is used frequently in surgery of the gall bladder and biliary passages. A left sub costal incision is used in elective splenectomy. The incision may be continued across the midline to a double Kocher's incision, which provides excellent access to the upper abdomen. The nerves and blood vessels are cut minimal. The disadvantage is, it takes longer time to open and to close the abdomen.
4. **Paramedian incisions:** This is a vertical incision over the midrectus sheath. Rectus muscle is retracted laterally then the posterior sheath is

incised vertically. This requires more time for performance and closure. It has no added advantage over the vertical midline incision. Its chief advantage lies in the exceptionally strong scar, which results although it cannot be readily extended and it is vulnerable to infection in septic cases.

5. OTHERS

Pfannenstiel incision

Port site incision

The most DESTRUCTIVE incisions are:

1. Para-rectus incision: This is made just lateral to the rectus abdominis muscle. This destroys the intercostal nerves and blood vessels as they course medially. It has no advantage over the midline or the rectus incision.
2. Long oblique incision: These are destructive to nerve and blood supply.
3. Multiple incisions: Multiple incisions produce areas of weakness in between them. A number of hernias have developed at the angle formed by the vertical midline incision followed by a subcostal incision.

AETIOPATHOLOGY

Many factors, singly or in various combinations may cause the failure of the wound to heal satisfactorily and lead to the development.

The important etiological factors are,

1. Postoperative wound infection
2. Systemic sepsis
3. Type of incision
4. Suture material employed
5. Faulty closure technique
6. Drainage tubes
7. Post operative wound dehiscence ('burst abdomen')
8. Age
9. Obesity
10. Increased post-operative abdominal pressure
11. General debility
12. Anemia
13. Hypoproteinemia
14. Ascorbic acid deficiency
15. Steroid therapy
16. Cytotoxic drugs
17. Radiation

TWO TYPES

EARLY AND LATE

EARLY HERNIAS

These which appear soon after the original laparotomy closure, often involves the whole length of the wound grows rapidly and becomes large.

LATE HERNIAS

TISSUE FAILURE: The etiology of the late occurring hernias is not clear. The hernia develops in what apparently is a perfectly healed wound that has functioned satisfactorily for 5, 10 or even more years after the operation. The incidence is presumably the result of the failure of the collagen in the scar, although there seems to be no obvious reason why mature collagen, which has served well for a number of years, should change its structure. The aging and weakening of the tissues and the raised intra-abdominal pressure associated with chronic cough, constipation, and prostatism are cited as factors.

COLLAGEN ABNORMALITIES: Abnormal collagen production and maintenance have been shown too associated with recurrent hernias in certain patients. There is a deficiency of collagen and abnormalities in its physio-chemical structure, manifesting in reduced hydroxyproline production and changes in the diameter of the collagen fibers. These changes have been demonstrated in these patients in other sites such as skin, lung, and pericardium, and may be associated with an imbalance between proteolytic enzymes and their

inhibitors and other enzyme abnormalities found in patients with emphysema and those who smoke.

CLINICAL MANIFESTATIONS

The patients complain about an unsightly bulge in the surgery scar, pain and discomfort. They often suffer from a heavy sickening, dragging sensation intensified by coughing and straining. In large dependent hernias, areas of skin may undergo pressure ischemic necrosis and may ulcerate and rarely the hernia may rupture. If the hernia strangulates, the symptoms of intestinal obstruction and ischemic bowel will supervene. There is often a history of frequent, moderate, incomplete obstruction attacks that manifest as colicky pain and vomiting. Intertrigo can develop between the hernia and the abdominal wall in the deep crease. Rupture of large incisional hernia is encountered occasionally. The hernias are almost invariably large, lower abdominal incisional hernias that have avascular, grossly stretched scar at their dependent portion. The contents progressively increase in volume, further impairing the blood supply of skin of abdominal wall and ulceration develops. If this is not controlled, the ulcer will break down, and necrosis of skin with infection or even frank evisceration may occur. Hernias with untreated stab wounds of the abdomen are becoming more frequent as selective non-operative treatment of such wounds has become commonplace. After laparoscopy, a

parallel situation may occur, within a 1.5 cm infra or supraumbilical incision is untreated except for skin closure.

Hernias are commonly observed in patients with renal failure via peritoneal dialysis catheter sites, although most hernias associated with continuous ambulatory peritoneal dialysis is ventral or umbilical. These defects permit intestinal incarceration, usually with a knuckle of intestine caught in the rent in the transversalis fascia. The wounds are tender erythematous and often tense or exhibit regional swelling.

INDICATIONS FOR SURGERY

- Pain and discomfort.
- For aesthetic reasons for a large and unsightly hernia.
- Large hernias with small openings have a high risk of strangulation and should be repaired
- History of recurrent attacks of subacute obstructions, incarceration and
- irreducibility and strangulation are definitive indications.

TREATMENT

General principles of operative treatment

The major consideration in the incisional hernia repair includes the following.

1. Choice of incision
2. Isolation of healthy fascia
3. Closure of the sac.

4. Fascial versus mesh closure.

5. Drains.

Good relaxation with minimal respiratory depression is important. Hemostasis should be perfect since hematoma formation followed by infection almost certainly leads to recurrence. It is best to use permanent suture material for repair.

1. CHOICE OF INCISION

This depends on the defect. A transverse closure should be used wherever possible. An ellipse of skin is usually removed over the hernia and clamps are applied to the skin and sac for continuous traction. Sac is dissected free of subcutaneous fat until the medial limit of fascia is reached.

2. ISOLATION OF HEALTHY FASCIA

Hernia with several locules or sacs may present a technical challenge. One approach is to dissect away the fat, from the fascia at a distance of 2 to 3 inches from the primary defect, open the abdomen through normal fascia and then introduce two fingers into the peritoneal cavity to palpate the fascia and the fascial defect at the neck of the hernial sac, to find other hernial sites. This method guarantees safe entry into the sac, but this creates another fascial defect which, has to be closed. For firm closure, a one inch rim of carefully dissected fascia around the neck of sac is necessary.

3. CLOSURE OF THE SAC

It is done in one layer incorporating both fascia and peritoneum after opening the sac, freeing all adhesions, reducing the viscera and exploring the abdomen. The closure of the sac as a separate layer adds nothing to the strength or integrity to the repair, the most serious problem with the treatment of large or mature incisional hernias is the fascial closure. If the hernia is large with a round defect two options are available – counter incisions in fascia remote from the defect can be used, but these must be extensive and prevent tension or an autogenous or synthetic prosthesis can be inserted to effect first closure.

4. DRAIN

Drains are usually required in all but the small incisional hernias and are necessary when the mesh is inserted into the wound. The most practical type of drain is the suction tube drain with multiple perforations and allows the patients complete mobility on the day of operation and thereafter, It stays 5-6 days in place (Or until there is less than 100 ML of drained fluid.)

5. ANTIBIOTICS

Preferably higher antibiotics are given as prophylactic measure up to the 6th post operative antibiotics are not required when an effective closed suction drainage is used, unless the patient has a diabetic disorder or if pus is detected during the repair.

METHODOLOGY

This was a cross-sectional hospital based study. It included patients admitted to the Tirunelveli medical college hospital's emergency surgical wards, Tirunelveli, from December 2017 to June 2019. A proforma has been developed to record patients with complicated hernias and collected data. Those willing to undergo corrective surgery were registered and interviewed systematically.

Among all patients 100 were selected for the study, of which 77 were males and 23 were females.

Data collected included:

- Detailed history
- Clinical examination findings
- Routine investigations
- Operative technique
- Per operative findings
- Postoperative course and complications

The data collected was analyzed by applying appropriate statistical methods (SPSS V 21).

INCLUSION CRITERIA

Patients of age more than 13 years with complicated hernias like irreducibility, obstruction and strangulation.

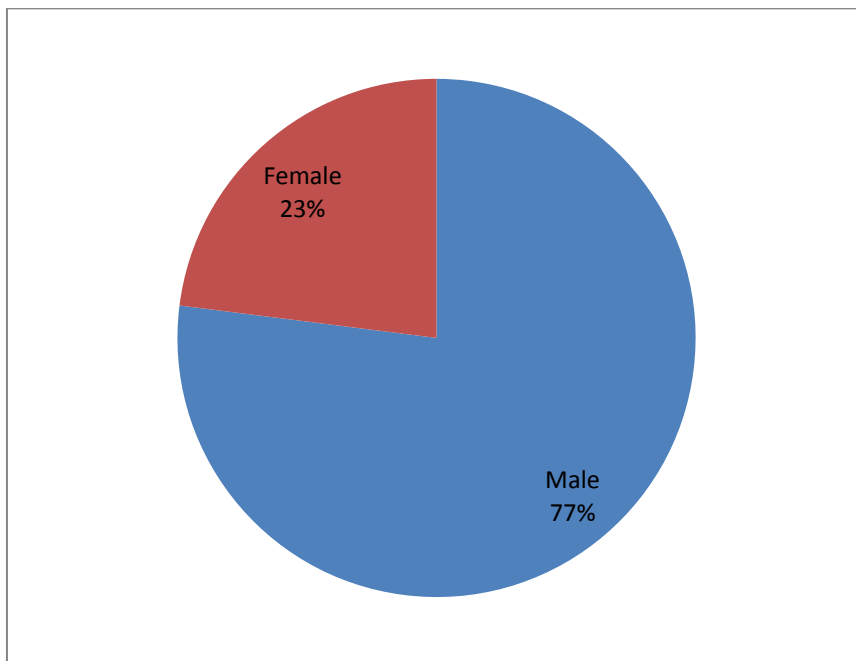
EXCLUSION CRITERIA

Patients of age less than 13 years of age.

RESULTS

GENDER DISTRIBUTION

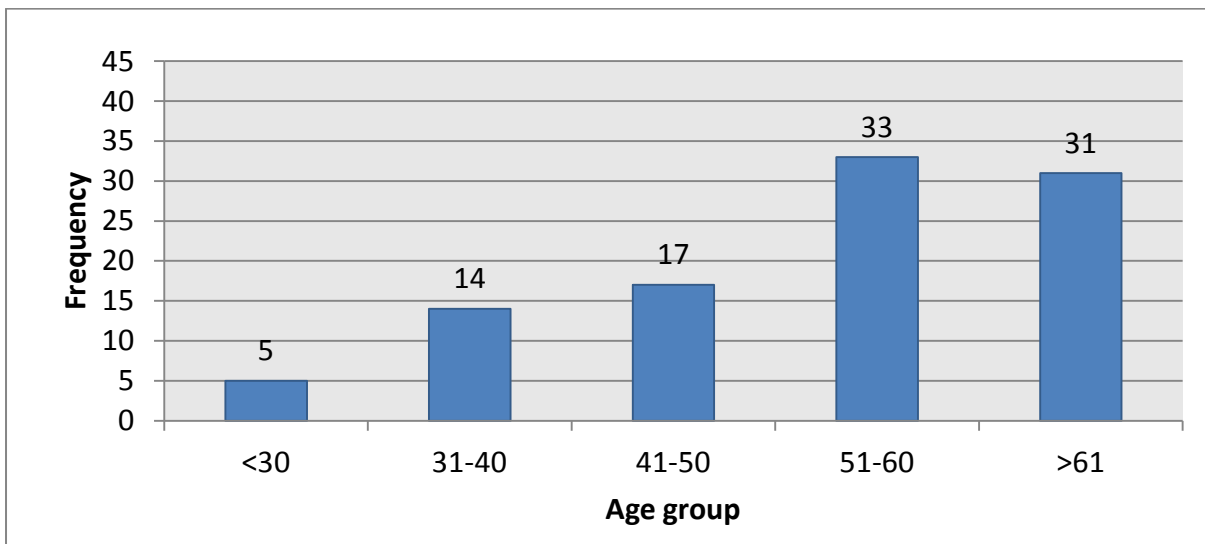
Gender	Frequency	Percent
Male	77	77.0
Female	23	23.0
Total	100	100.0



Among 100 cases 77 % were males and 23 % were females with male to female ratio of 3.3 : 1.

AGE DISTRIBUTION

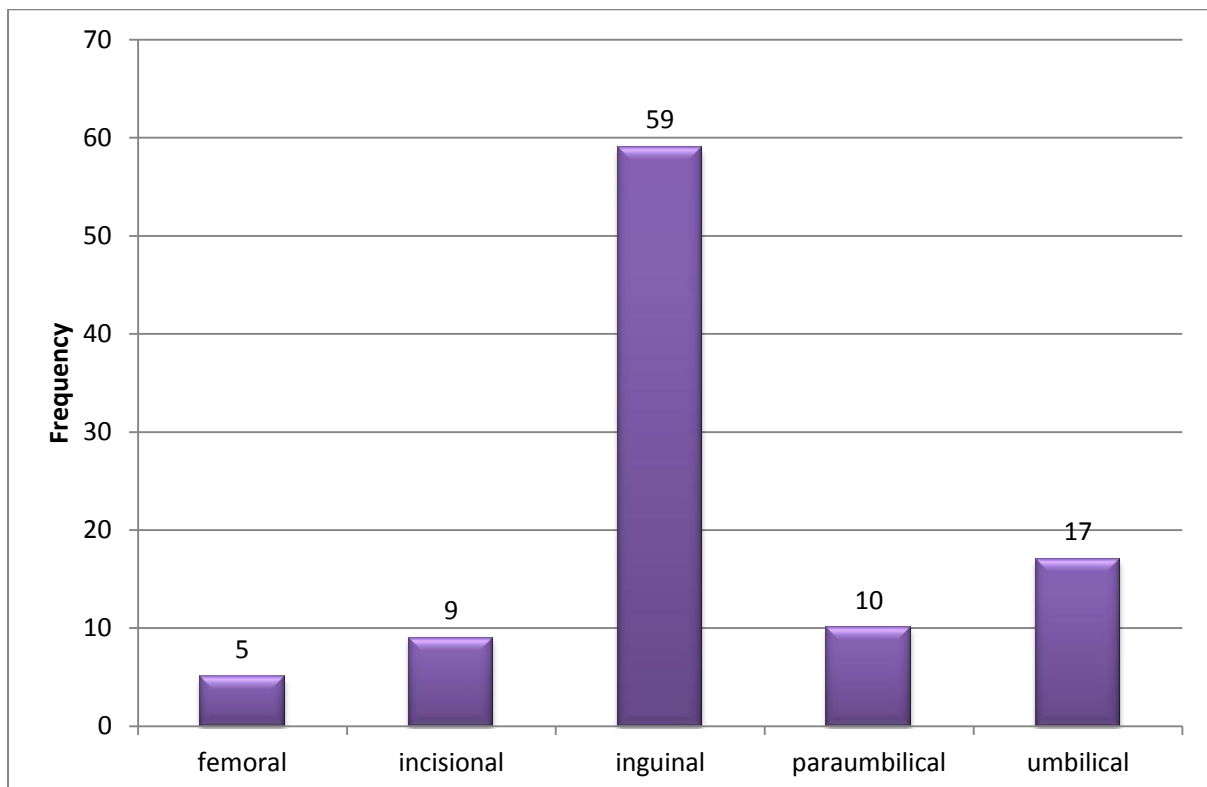
AGE GROUP	FREQUENCY	PERCENT
13-30	5	5.0
31-40	14	14.0
41-50	17	17.0
51-60	33	33.0
>61	31	31.0
Total	100	100.0



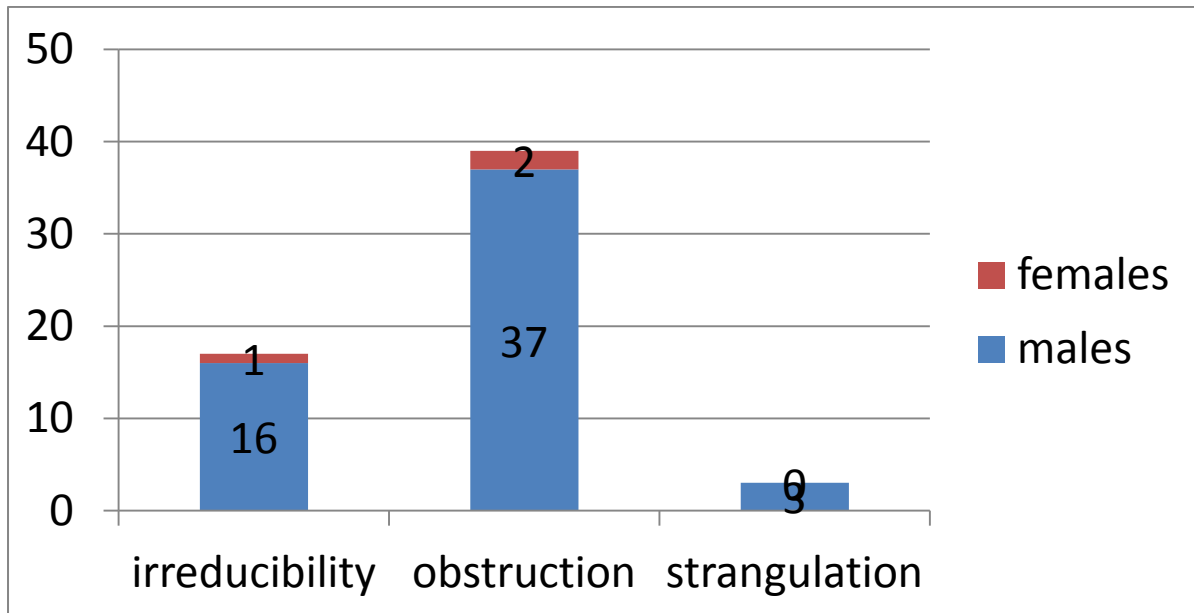
ANALYSIS OF DIFFERENT TYPES OF HERNIAS

Type of hernia	Frequency	Percent
Femoral	5	5.0
Incisional	9	9.0
Inguinal	59	59.0
Paraumbilical	10	10.0
Umbilical	17	17.0
Total	100	100.0

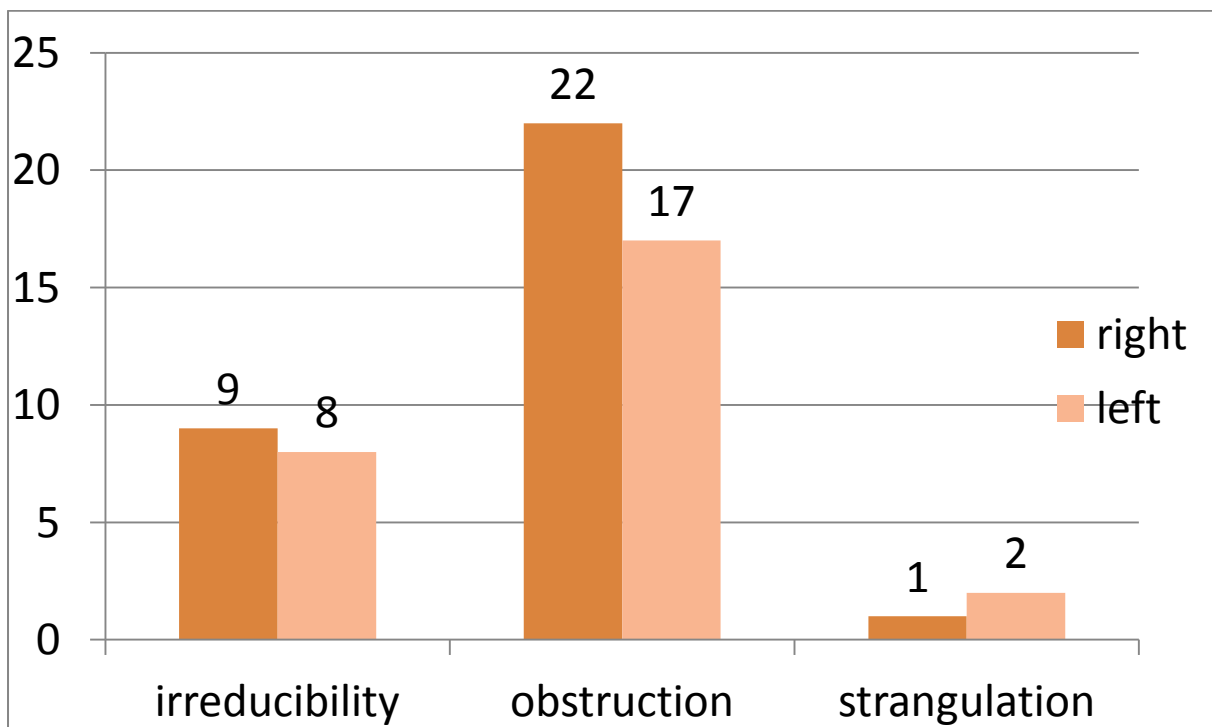
Of the 100 cases reported inguinal hernia, 59% tops the list, followed by umbilical hernia, 17%.



INGUINAL HERNIA

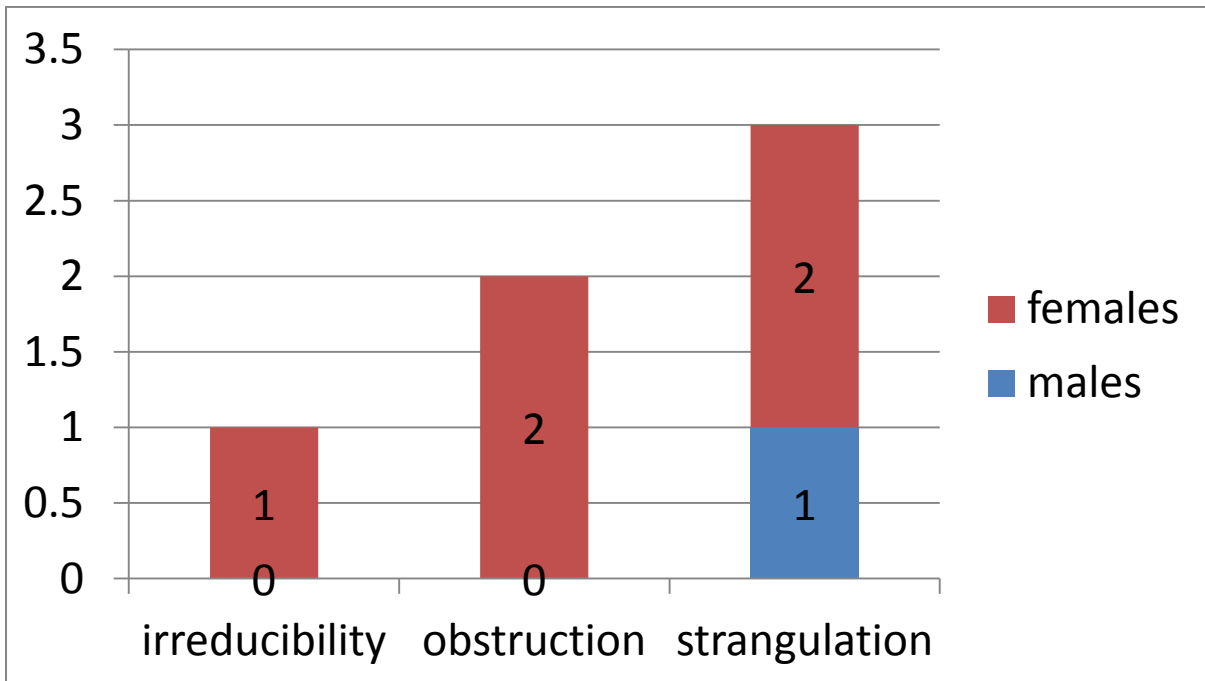


Obstruction (39%) followed by irreducibility (17%) and strangulation (3%) is the most common complication of inguinal hernias.

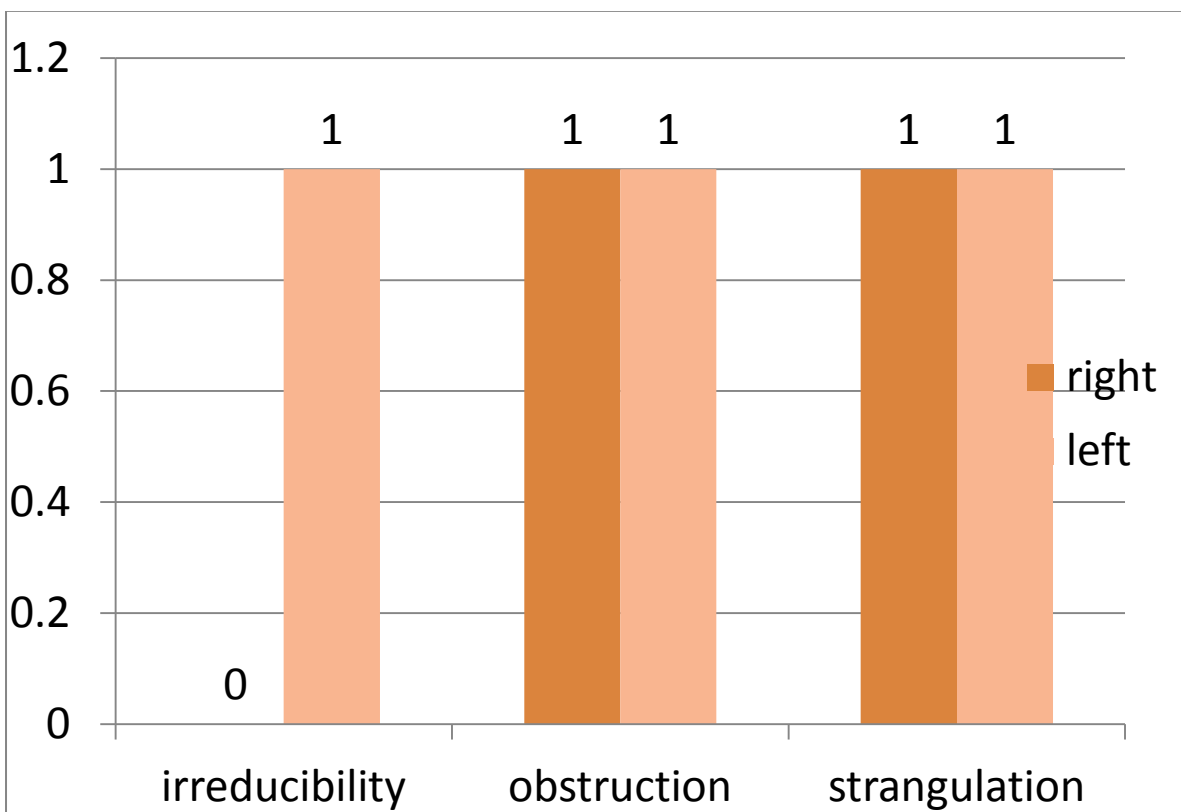


The right inguinal hernia, on the other hand, is more common than the left inguinal hernia

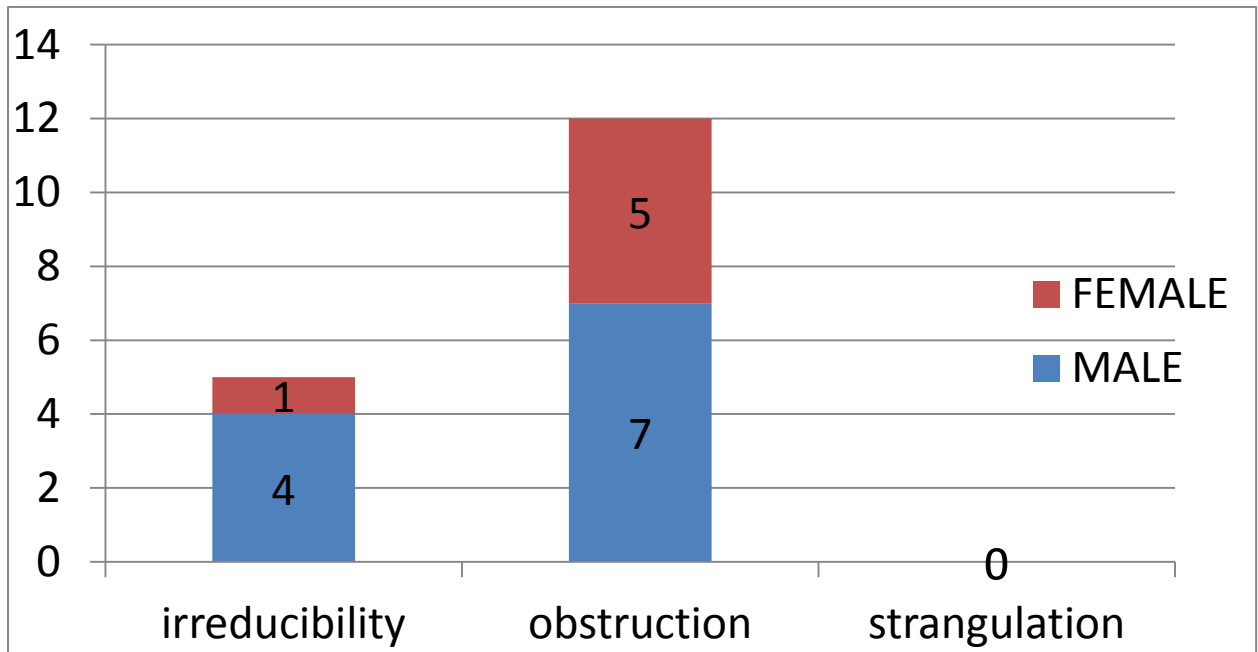
FEMORAL HERNIA



In this study, strangulation is more common in females in femoral hernia.

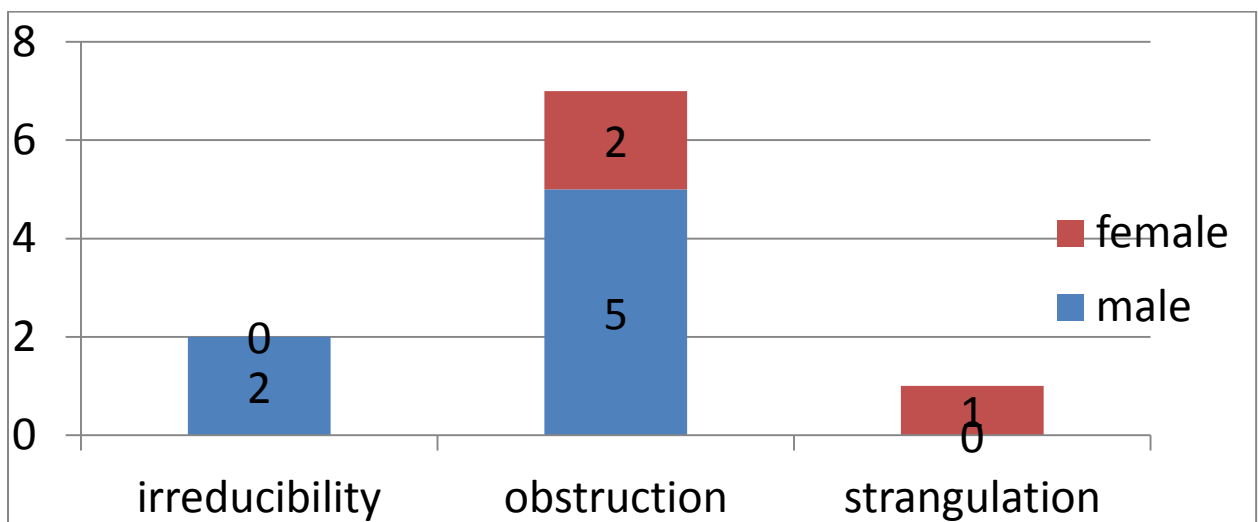


UMBILICAL HERNIA



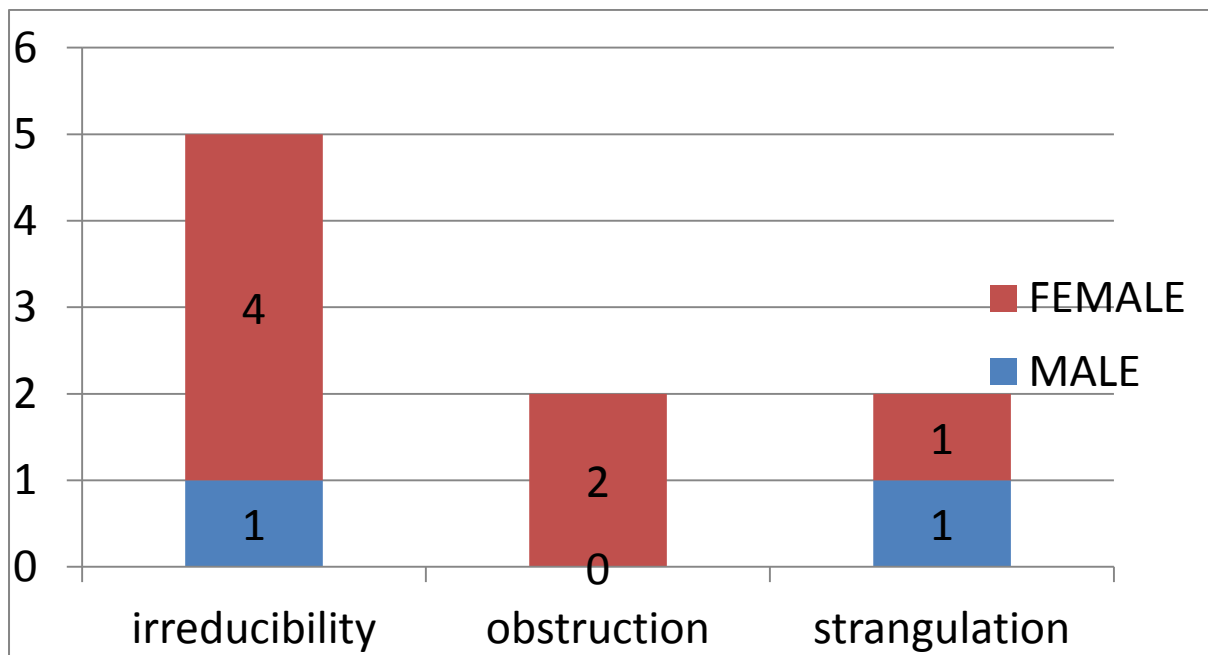
Among umbilical hernias, obstruction is the most common complication presented in this study.

PARAUMBILICAL HERNIA



Obstruction is the most common complication among paraumbilical hernias.

INCISIONAL HERNIA

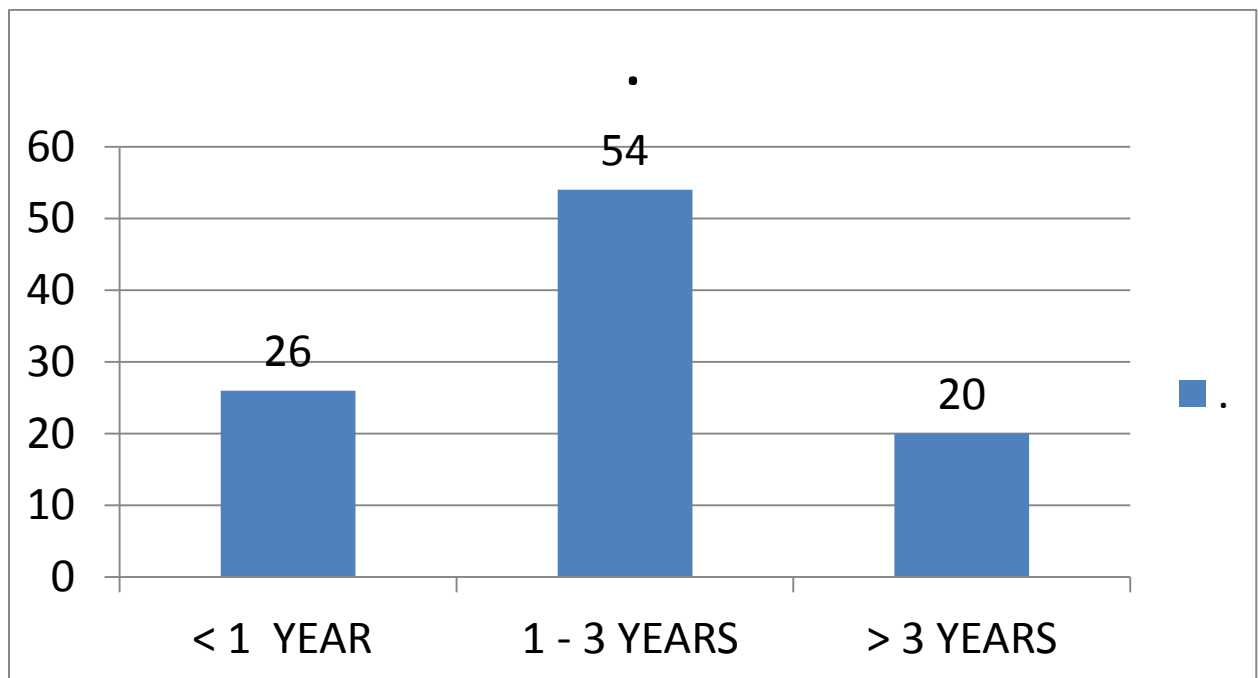


In this study, the most common presentation in incisional hernias is irreducibility.

CLINICAL FINDINGS	NO. OF CASES	PERCENTAGE
Swelling	100	100
Pain	100	100
Vomiting	80	80
Constipation	72	72
Obstipation	18	18
Abdominal distension	24	24
Fever	12	12

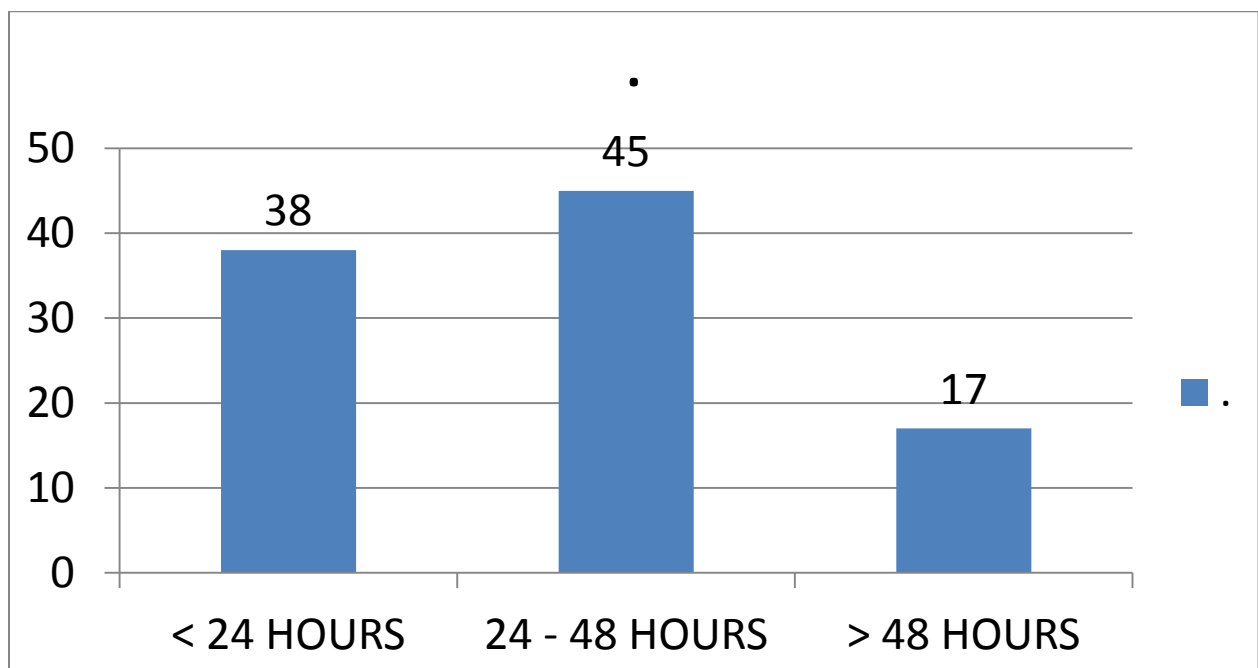
Among 100 cases studied, all the patients had swelling and pain, with vomiting in 80 % of patients and constipation in 72% of patients.

DURATION OF SWELLING



54 % of the patients had swelling for the period of 1-3 years.

PRESENTATION TO EMERGENCY WARD



Majority of the patients presented with pain to Emergency ward after 24 – 48 hours.

SIGNS

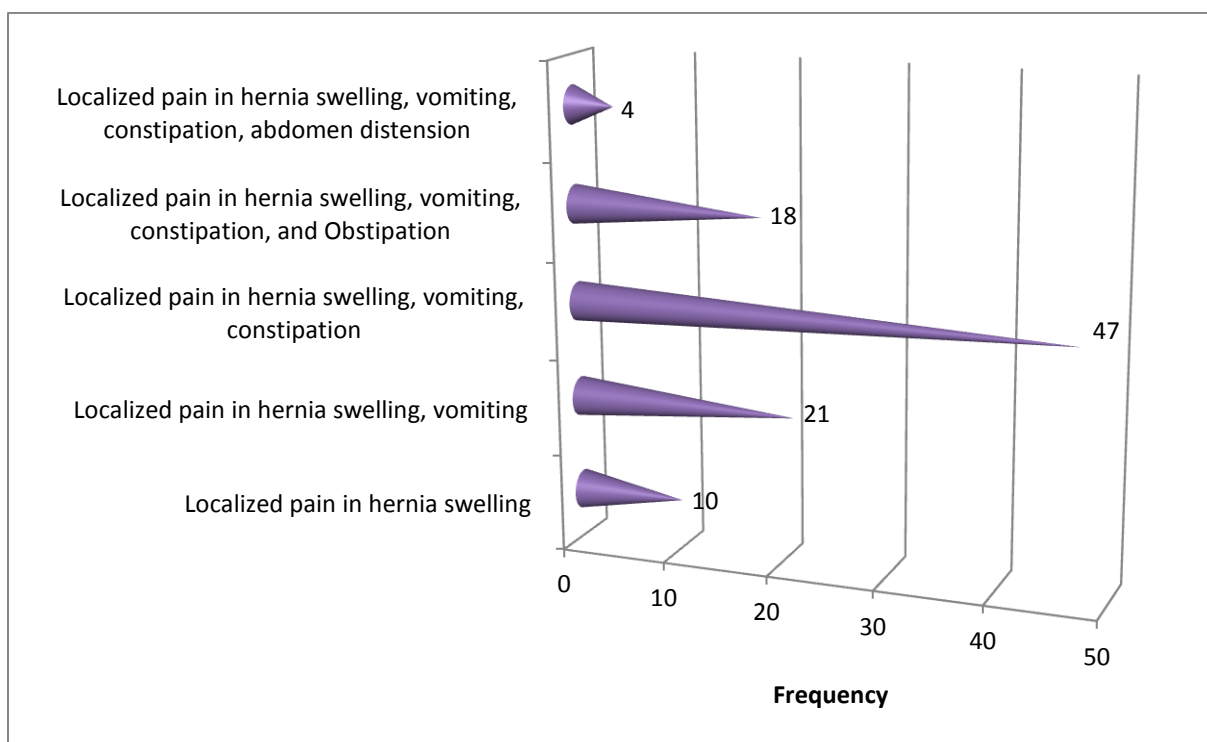
CLINICAL FINDINGS	NO. OF CASES	PERCENTAGE
No impulse on coughing	100	100
Irreducible	100	100
Local tenderness	100	100
Visible peristalsis	64	64
Decreased/ absent bowel sounds	8	8

All the patients showed signs of irreducibility, tenderness, and no cough impulse.

CLINICAL MODE OF PRESENTATION

SYMPTOMS	NO. OF CASES	PERCENT
Localized pain in hernia swelling	10	10
Localized pain in hernia swelling, vomiting	21	21
Localized pain in hernia swelling, vomiting, constipation	47	47
Localized pain in hernia swelling, vomiting, constipation, and Obstipation	18	18
Localized pain in hernia swelling, vomiting, constipation, abdomen distension	4	4

Majority of the patients (47%) presented with swelling, pain, vomiting and constipation.



CONTENTS OF SAC

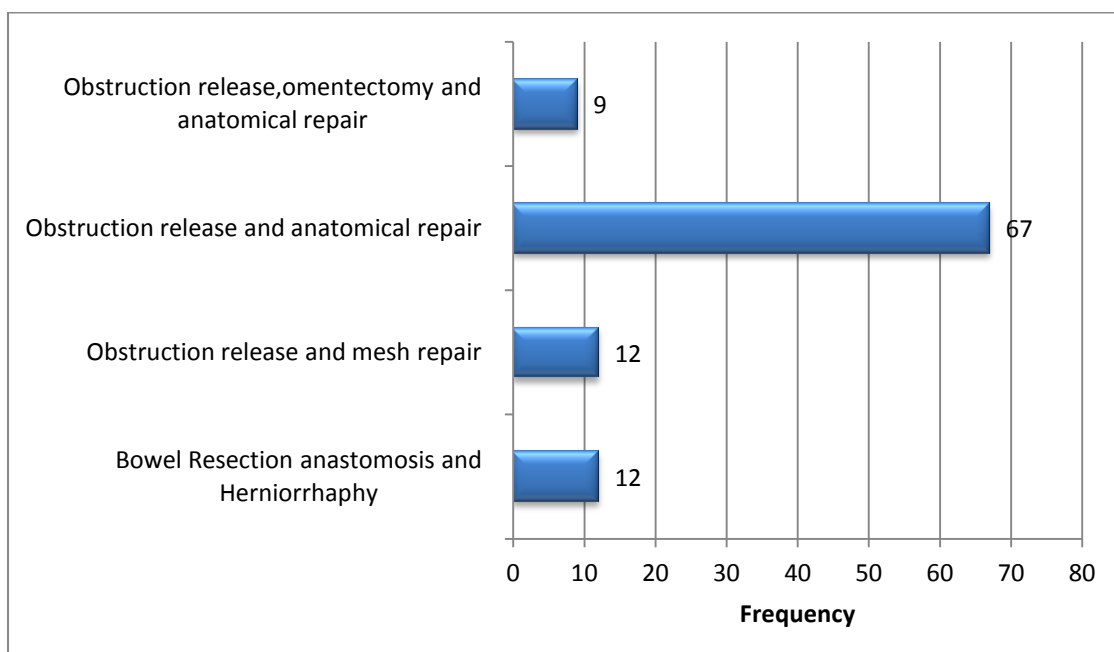
		No. of cases	Percentage
Viable	83	Only omentum	23
		Omentum and small intestine	22
		Only intestine	36
		colon	1
		Omentum and colon	1
Non viable	17	Only omentum	5
		Omentum and small intestine	4
		Only intestine	8

Intestine was the most common content.

PROCEDURE DONE

Procedure done	Frequency	Percent
Bowel Resection anastomosis and Herniorrhaphy	12	12.0
Obstruction release and mesh repair	12	12.0
Obstruction release and anatomical repair	67	67.0
Obstruction release, omentectomy and anatomical repair	9	9
Total	100	100.0

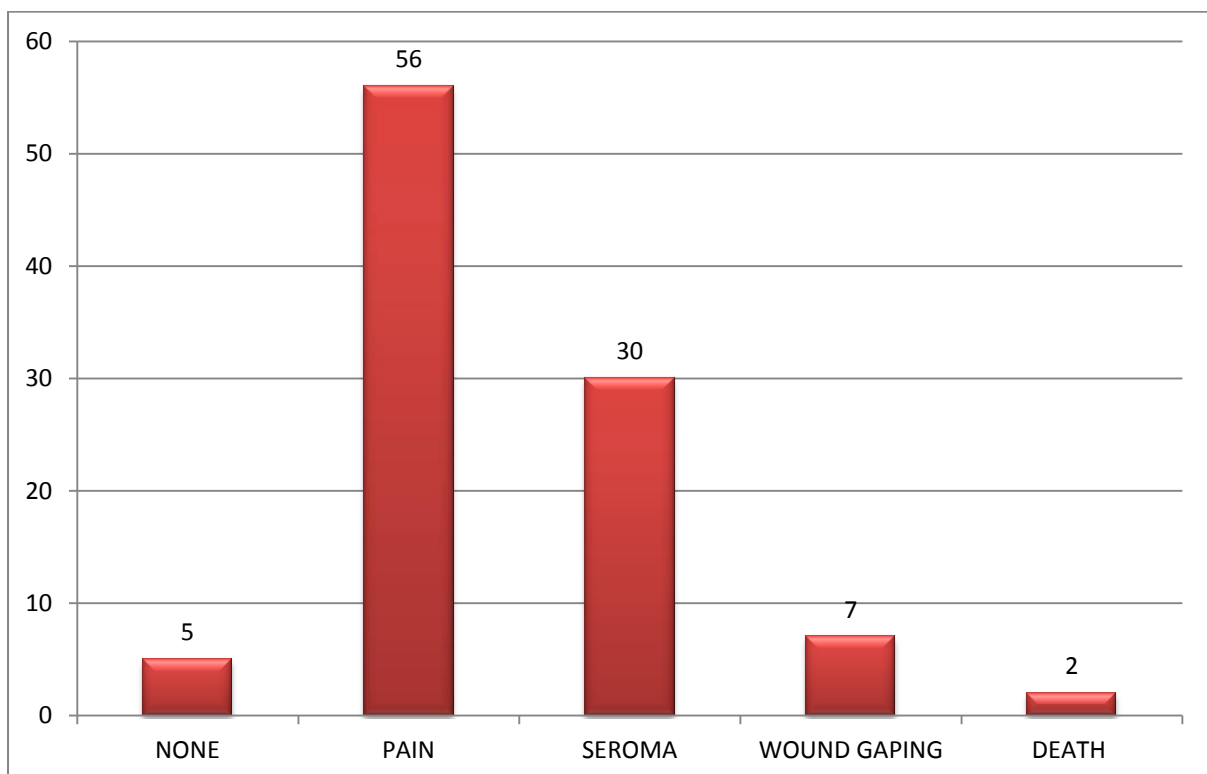
Of the 100 cases, 67% had obstruction release and anatomical repair.



COMPLICATIONS

.	No of cases	Frequency
NONE	5	5.0
PAIN	56	56.0
SEROMA	30	30.0
WOUND GAPING	7	7.0
DEATH	2	2.0

Postoperative pain in 56% of cases, seroma in 30%, wound gaping in 7%, septicemia in 2%.



DISCUSSION

Complicated presentations of hernias are usually associated with the increased duration of hernias and can affect any age group. Patients with chronic respiratory illness are prone for getting hernias probably due to persistent severe coughing.

A maximum of 100 cases that were presented during the study period with complicated presentation were analyzed.

The mean age of patients with complications is **55 years**, compared to **65 years** in other study by Pollok and **70 years** by Andrew and Kulah et al⁴⁴.

Among these cases 59 cases had inguinal hernias, 17 had umbilical hernia, 10 had paraumbilical hernia, 9 had incisional hernia and 5 had femoral hernia. Majority of the cases of complicated groin hernias were seen in 5th and 6th decade, Obstruction was the most common complication seen in 62% of cases.

Complicated presentation of groin hernia was predominantly seen in males [77] than in females [23] with male to female ratio of 3.3:1.

Right-sided hernias (32%) were more common among inguinal hernias than left-sided hernias (27%), umbilical hernia was seen in 17 cases, paraumbilical in 10 cases and incisional hernia in 9 cases, femoral hernias were observed in five cases, three of those were on the right and two on the left.

The clinical presentation and duration of hernia varied in the study group, among which 26 patients had hernia for < 1 year, 54 patients had hernia for 1- 3 years, 20 patients had hernia for more than 3 years.

Clinically 47 cases had localized groin pain, with vomiting and was associated with constipation.

Our hospital serves a patient population with low awareness, mostly from rural areas. This was an explanation that most patients in the current series were admitted to the hospital 48 hours or more after symptoms started.

The duration of pain was for < 24 hours in 38 cases and 24-48 hours in 45 cases and more than 48 hours in 17 cases.

Clinically all patients presented with swelling, which was tender, and there was no impulse on coughing. Abdominal examinations showed abdominal distension in 24 cases.

Clinically it was difficult to distinguish between obstruction from strangulation as all the cases had localized pain, tenderness at the hernia site and was associated with vomiting in most of them.

The definitive diagnosis of strangulation can be made only at the timely exploration. Bekoe in his prospective review of 118 patients with obstructed / strangulated stated that he could find "no definite criterion" to differentiate incarcerated hernia with viable contents from the non-viable contents and cannot be diagnosed on clinical grounds⁴⁵.

Obstruction is associated with 50% risk of bowel ischemia. Only 10- 15% of obstructed groin hernias contain necrotic bowel.

In the primary management of all complicated hernias, surgical reduction and repair accompanied by aggressive pre and postoperative care is suggested.

Bowel resection and end-to-end anastomosis with repair were done in 10% of cases that had nonviable bowel, as compared to 6% by Kulah et al⁴⁶.

In this study, 62% of cases had bowel obstruction and among these 17% had non-viable contents (12 + 5).

Obstruction release and anatomical repair were done in 67% of cases and bowel resection and end to end anastomosis was done in 12 % of cases.

The commonest postoperative complication encountered in the study was pain (56) and scrotal seroma (30) followed by wound gaping (7). Septicaemia, multi-organ failure and death occurred in two cases.

The mortality rate in this study is 2%, when compared to the study by Kulah et al in which the mortality rate was 1.9% in first 24 hours, 4.3% in 24-48 hours, later increased to 9% in more than 48 hours⁴⁶.

CONCLUSION

- Complicated presentations are seen more in elderly and older people and delayed presentation is also responsible for an unfavourable outcome.
- Right-sided inguinal hernia is more common in males.
- Femoral hernia is common in females and strangulation is common in femoral hernia in this study.
- The cumulative risk of strangulation increases with time and type of hernias.
- Clinical diagnosis may be difficult as there are no definitive criteria to differentiate obstructed hernia with viable contents from that of non-viable contents. Strangulation can be reliably identified only at the time of surgery.
- Due to the risk of perforation and other complications, manual reduction of obstructed hernias should never be attempted.
- The primary management of all incarcerated hernias is prompt surgical reduction and repair accompanied by aggressive pre and postoperative care.
- The mortality rate continues to be associated with advancing age and resection of necrotic bowel.

BIBLIOGRAPHY

1. Schwartz SI, Shires GT, Spencer FC, Daly JM, Fischer JE, Galloway AC. Principles of Surgery (7 th ed.). McGraw-Hill. New York; 1999
2. Zinner MJ, Ashley SW. Hernias. In: Maingot's Abdominal Operations. 11th Ed, McGraw-Hill Companies. 2007;103-140.
3. Kulah B, Kulacoglu IH, Oruc MT, Duzgun AP, Moran M, Ozmen MM, et al. Presentation and outcome of incarcerated external hernias in adults. Am J Surg. 2001;181(2):101-4.
4. Oishi SN, Page CP, Schwesinger WH. Complicated presentations of groin hernias. Am J Surg. 1991;162(6):568-7
5. Flament JB. [Functional anatomy of the abdominal wall]. Chirurg 2006; 77:401.
6. Ellis H. Applied anatomy of abdominal incisions. Br J Hosp Med (Lond) 2007; 68:M22.
7. Langer K, Cleavage of, the curia, et al. Presented at the Meeting of the Royal Academy of Sciences, April 25, 1861. Clin Orthop 1973; 91:3.
8. Wong VW, Bhatt KA, Vial IN, et al. Beyond Langer's Lines: Manipulating wound mechanical forces to control hyperochic scar formation in the red Duroc pig. J Am Coll Surg 2010; 211:S77.
9. TOBIN CE, BENJAMIN JA. Anatomic and clinical re-evaluation of Camper's, Scarpa's, and Colles' fasciae. Surg Gynecol Obstet 1949; 88:545.

10. Tokita K. Anatomical significance of the nerve to the pyramidalis muscle: a morphological study. *Anat Sci Int* 2006; 81:210.
11. Mwachaka PM, Saidi HS, Odula PO, et al. Locating the arcuate line of Douglas: is it of surgical relevance? *Clin Anat* 2010; 23:84.
12. Beer GM, Schuster A, Seifert B, et al. The normal width of the linea alba in nulliparous women. *Clin Anat* 2009; 22:706.
13. Rozen WM, Ashton MW, Taylor GI. Reviewing the vascular supply of the anterior abdominal wall: redefining anatomy for increasingly refined surgery. *Clin Anat* 2008; 21:89.
14. Krupski WC, Sumchai A, Effeney DJ, Ehrenfeld WK. The importance of abdominal wall collateral blood vessels. Planning incisions and obtaining arteriography. *Arch Surg* 1984; 119:854.
15. Gardner GP, Josephs LG, Rosca M, et al. The retroperitoneal incision. An evaluation of postoperative flank 'bulge'. *Arch Surg* 1994; 129:753.
16. Sippo WC, Burghardt A, Gomez AC. Nerve entrapment after Pfannenstiel incision. *Am J Obstet Gynecol* 1987; 157:420.
17. Whiteside JL, Barber MD, Walters MD, Falcone T. Anatomy of ilioinguinal and iliohypogastric nerves in relation to trocar placement and low transverse incisions. *Am J Obstet Gynecol* 2003; 189:1574.
18. Stulz P, Pfeiffer KM. Peripheral nerve injuries resulting from common surgical procedures in the lower portion of the abdomen. *Arch Surg* 1982; 117:324.

- 19.Schneiderman BI, Bomze E. Paresthesias of the lateral femoral cutaneous nerve after pelvic surgery. *Am Surg* 1967; 33:84.
- 20.Skandalakes. *Surgical anatomy and embryology. The Surgical Clinics of North America.* 2003;83(5):1019-287.
- 21.Jones PF. *Emergency abdominal surgery.* 2nd ed. Philadelphia, PA: Churchill Livingstone; 1997. pp. 850-75.
- 22.De Meulder F, Wojciechowski M, Hubens G, Ramet J. Female hydrocele of the canal of Nuck: a case report. *Eur J Pediatr* 2006; 165:193.
- 23.McClusky DA 3rd, Mirilas P, Zoras O, et al. Groin hernia: anatomical and surgical history. *Arch Surg* 2006; 141:1035.
- 24.Attah AA, Hutson JM. The anatomy of the female gubernaculum is different from the male. *Aust N Z J Surg* 1991; 61:380.
- 25.Ando H, Kaneko K, Ito F, et al. Anatomy of the round ligament in female infants and children with an inguinal hernia. *Br J Surg* 1997; 84:404.
- 26.Holzheimer RG. Inguinal Hernia: classification, diagnosis and treatment-- classic, traumatic and Sportsman's hernia. *Eur J Med Res* 2005; 10:121.
- 27.Read, RC. Metabolic factors contributing to herniation: a review. *Hernia* 1998; 2:51.
- 28.Read RC. British contributions to modern herniology of the groin. *Hernia* 2005; 9:6.

29. Markamalongoni, Rossen MJ. Hernias. 18th ed. Chapter 44. In: Sabiston's Textbook of Surgery, Townsend CM, Beauchamp RD, Evers BM, Mattox KL, eds. Philadelphia: Saunders 2008;2:1155-79.
30. Way LW. Current surgical diagnosis and treatment. 10th ed. Philadelphia Appleton and Lange; 1994. pp. 712-23.
31. Mauch J. Incarcerated and strangulated hernia; Surgical approach and management. Swiss Surgical 2000;6(1):28-31.
32. Ellis BW. Fielding intestinal obstruction, general principles. Strangulated external hernia; pp. 465-73.
33. Browse NL, Black J, Burnand KG, Thomas WEG. Inguinal hernia. An introduction to the symptoms and signs of surgical disease. 4th ed. London: Hodder-Arnold; 2005. pp. 361-72
34. Rutkow IM. Groin hernia surgery. Surgical Clinics of North America. 1998;178(6):741-3. Rutkow IM. Hernia repair. Surgical Clinics of North America. 2003;83(5):1019-287.
35. Lichtenstein IL, Shulman AG, Amid PK. The cause, prevention, and treatment of recurrent groin hernia. Surg Clin North Am 1993; 73:529.
36. Amid PK. Groin hernia repair: open techniques. World J Surg 2005; 29:1046.
37. Dahlstrand U, Wollert S, Nordin P, et al. Emergency femoral hernia repair: a study based on a national register. Ann Surg 2009; 249:672.

- 38.Sorelli PG, El-Masry NS, Garrett WV. Open femoral hernia repair: one skin incision for all. *World J Emerg Surg.* 2009;4:44. Published 2009 Nov 30. doi:10.1186/1749-7922-4-44
- 39.Blumberg NA. Infantile Umbilical hernia. *Surg Gynaecol Obstet* 1980;150:187
- 40.Current concepts on adult umbilical hernia. M. Velasco, M. A. Garcia-Ureña, M. Hidalgo, V. Vega and F. J. Carnero. *Hernia.* Vol 3.No 4.233-239
- 41.Arroys et al. Randomised clinical trial comparing suture repair and mesh repair of adult umbilical hernia *BJS* 2001;88(10): 1321-1323.
- 42.Askar OM. Aponeuratic hernias. Recent observation upon epigastric and paraumbilical hernias. *Surg clinics of North America* 1984;64:315
- 43.Thomas A Santora, joel J. rosyln. Incisional hernia; *surgical clinics of N Am*,73; 557-70.1993
- 44.Kulah B, Kulacoglu IH, Oruc MT, Duzgun AP, Moran M, Ozmen MM, et al. Presentation and outcome of incarcerated external hernias in adults. *Am J Surg.* 2001;181(2):101-4.
- 45.Bekoe S. Prospective analysis of management of incarcerated and strangulated inguinal hernia. *Atn J Surg.* 1973;126:665-8.
- 46.Kulah B, Duzgun AP, Moran M, Kulacoglu IH, Ozmen MM, Coskun F. Emergency hernia repair in elderly. *Am J Surg.* 2001;182(5):455-9.

PROFORMA

Name: Age: Sex:

Address : Occupation :

I.P. No. : Unit / Ward:

Date of Admission:

Date of Surgery:

Date of Discharge:

Chief Complaints:

Past History:

General Examination:

Pulse Rate:

BP :

CVS:

RS:

P/A:

CNS:

GCS:

L/E:

Diagnosis :

Investigations

Hb:

Urea:

Serum Na+:

Serum K+:

WBC Count:

ECG:

USG:

Management

Complications

நோயாளிகளுக்கு அறிவிப்பு மற்றும் ஒப்புதல் படிவம்
(மருத்துவ ஆய்வில் பங்கேற்பதற்கு)

ஆய்வு செய்யப்படும் தலைப்பு:

பங்கு பெறுவரின் பெயர்:

பங்கு பெறுவரின் வயது:

		பங்கு பெறுவர் இதனை குறிக்கவும் ✓
1.	நான் மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்களை படித்து புரிந்து கொண்டேன். என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டுள்ளது என அறிந்து கொண்டேன்.	<input type="checkbox"/>
2.	நான் இவ்வாய்வில் தன்னிச்சையாக தான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும், எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.	<input type="checkbox"/>
3.	இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்து மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன்.	<input type="checkbox"/>
4.	இந்த ஆய்வின் மூலம் கிடைக்கும் தகவலையோ, முடிவையோ பயன்படுத்திக் கொள்ள மறுக்க மாட்டேன்.	<input type="checkbox"/>
5.	இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக் கொள்கிறேன் எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின் படி நடந்து கொள்வதுடன், ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிக்கிறேன். என உடல் நலம் பாதிக்கப்பட்டாலோ, அல்லது எதிர்பாராத, வழக்கத்திற்கு மாறான நோய்குறி தென்பட்டாலோ உடனே இதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்கிறேன்.	<input type="checkbox"/>

பங்கேற்பவரின் கையொப்பம் / இடம்

கட்டைவிரல் ரேகை

பங்கேற்பவரின் பெயர் மற்றும் விலாசம்

ஆய்வாளரின் கையொப்பம் / இடம்

ஆய்வாளரின் பெயர்

மையம்

கல்வியறிவு இல்லாதவர்க்கு (கைரேகை வைத்தவர்களுக்கு) இது அவசியம் தேவை

சாட்சியின் கையொப்பம் / இடம்

பெயர் மற்றும் விலாசம்

S. No.	IP.NO	NAME	AGE	GENDER	DATE OF ADMISSION	DATE OF DISCHARGE	SWELLING	DURATION OF SWELLING	PAIN	TIME OF PRESENTATION	VOMITING	CONSTIPATION	OBSTIPATION	ABDOMINAL DISTENSION	FEVER	NO IMPULSE ON COUGHING	IRREDUCIBILITY	LOCAL TENDERNESS	VISIBLE PERISTALSIS	DECREASED/ ABSENT BOWEL SOUNDS	DIAGNOSIS	TYPE OF HERNIA	SIDE	PROCEDURE DONE	CONTENT OF SAC	POST OPERATIVE COMPLICATIONS
1	91576	MANI	65	MALE	16-12-2017	01-05-2018	YES	1	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	WOUND GAPING
2	92587	CHELLAIAH	65	MALE	20-12-2017	30-12-2017	YES	1	YES	24-48 HOURS	YES	NO	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	PAIN
3	93835	SIVABALAMURUGAN	47	MALE	24-12-2017	01-06-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	PAIN
4	93931	RAJAMANI	65	MALE	25-12-2017	01-05-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	WOUND GAPING
5	456123	Saravanan	51	MALE	04-01-2018	04-09-2018	YES	> 3 YEARS	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM	SEROMA
6	71558	Chinnathai	46	FEMALE	10-01-2018	10-10-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND ANATOMICAL REPAIR	OMENTUM AND INTESTINE	WOUND GAPING

7	75640	Deivakani	45	FEMALE	10-01-2018	13-10-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT FEMORAL HERNIA	FEMORAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
8	4408	murugan	65	MALE	17-01-2018	26-01-2018	YES	> 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
9	8164	ramaiah	65	MALE	31-01-2018	17-02-2018	YES	> 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	BOTH	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	PAIN
10	52225	Rajadevar	75	MALE	04-02-2018	13-04-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM AND INTESTINE	PAIN
11	15716	ARUMUGASAMY	65	MALE	03-03-2018	13-03-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED LEFT FEMORAL HERNIA	FEMORAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	WOUND GAPING
12	72161	Esakki	70	MALE	10-03-2018	17-10-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
13	19039	SUBRAMANIAN	54	MALE	16-03-2018	26-03-2018	YES	1 - 3 YEARS	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN

14	50729	Murugan	45	MALE	20-03-2018	04-05-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM AND COLON	PAIN
15	20775	RAMACHANDRAN	75	MALE	23-03-2018	04-04-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	PAIN
16	50920	Sudalai	68	MALE	28-03-2018	14-04-2018	YES	1 - 3 YEARS	YES	> 48 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	DEATH
17	51172	Lakshmanan	19	MALE	31-03-2018	04-10-2018	YES	> 3 YEARS	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	NONE
18	38683	Amuthakani	58	FEMALE	20-04-2018	05-05-2018	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND ANATOMICAL REPAIR	OMENTUM AND INTESTINE	SEROMA
19	29131	PECHIMUTHU	35	MALE	27-04-2018	05-08-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	SEROMA
20	29432	RIGHT HERNIOPLASTY WITH EXCISION OF ENCYSTED HYDROCELE OF CORD	63	MALE	28-04-2018	05-09-2019	YES	1 - 3 YEARS	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	SEROMA

21	50508	Kunjammal	80	FEMALE	04-05-2018	26-04-2018	YES	1-3 YEARS	YES	24-48 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND ANATOMICAL REPAIR	OMENTUM	WOUND GAPING	
22	33550	PECHIMUTHU	35	MALE	14-05-2018	24-05-2019	YES	1-3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND Hernial content reduction and HERNIORRAPHY	INTESTINE	PAIN
23	31853	DURAI	36	MALE	15-05-2018	22-05-2019	YES	1-3 YEARS	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND Hernial content reduction and HERNIORRAPHY	OMENTUM	PAIN
24	34317	BALASUBRAMANIAN	58	MALE	17-05-2018	30-05-2018	YES	1-3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND Hernial content reduction and HERNIORRAPHY	INTESTINE	PAIN
25	36973	SIVASUBRAMANIAN	66	MALE	28-05-2018	06-11-2018	YES	1-3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND Hernial content reduction and HERNIORRAPHY	INTESTINE	SEROMA
26	9580	Iyyanar	85	MALE	02-06-2018	17-02-2018	YES	1-3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND Hernial content reduction and HERNIORRAPHY	INTESTINE	SEROMA
27	231143	Saraswathi	51	FEMALE	13-06-2018	21-06-2018	YES	> 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM	PAIN

28	42158	Mariammal	65	MALE	17-06-2018	30-06-2018	YES	> 3 YEARS	YES	24-48 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	STRANGULATED INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	SEROMA	
29	564561	Arumugam	54	MALE	21-06-2018	07-01-2018	YES	1	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM	SEROMA
30	44708	Elangomani	72	MALE	26-06-2018	15-07-2018	YES	1	YES	24-48 HOURS	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED LEFT INGUINAL HERNIA	INGUINAL	LEFT	BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	PAIN
31	9878	KARUPASAMY	56	MALE	02-07-2018	15-02-2018	YES	> 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	ST	PAIN
32	24509	POOJAI MANI	55	MALE	04-08-2018	22-04-2018	YES	> 3 YEARS	YES	< 24 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED LEFT INGUINAL HERNIA	INGUINAL	LEFT	BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	PAIN
33	31855	SIVA NANDA PERUMAL	52	MALE	05-08-2018	18-05-2018	YES	> 3 YEARS	YES	> 48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
34	60451	Seethalakshmi	69	FEMALE	15-08-2018	27-08-2018	YES	1	YES	24-48 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED RIGHT FEMORAL HERNIA	FEMORAL	RIGHT	BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	DEATH
35	65131	Parvathi	53	FEMALE	17-08-2018	10-01-2018	YES	1	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	WOUND GAPING

36	65656	Chidambaram--	70	MALE	19-08-2018	30-08-2018	YES	> 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	OMENTECTOMY AND HERNIORRAPHY	OMENTUM	PAIN
37	65503	Sudalai muthu-	65	MALE	22-08-2018	08-09-2018	YES	1 - 3 YEARS	YES	> 48 HOURS	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	INTESTINE	PAIN
38	68275	Varadaraja perumal	50	MALE	26-08-2018	10-10-2018	YES	1	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	SEROMA
39	2729	ashokan	57	MALE	01-10-2018	21-01-2018	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	OMENTECTOMY AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
40	2893	NARAYANA PERUMAL	40	MALE	01-10-2018	21-01-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
41	2784	KESAVAN	53	MALE	01-10-2018	21-01-2018	YES	> 3 YEARS	YES	< 24 HOURS	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	NONE
42	10720	PERUMAL	33	MALE	02-10-2018	21-02-2018	YES	1	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	SEROMA
43	14868	GOPALAKRISHNAN	52	MALE	02-10-2018	22-02-2018	YES	1	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND	INTESTINE	PAIN

52	71789	Vallikannu	61	FEMALE	09-12-2018	21-09-2018	YES	1	YES	< 24 HOURS	YES	YES	NO	NO	YES	YES	YES	YES	NO	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM	SEROMA
53	243126	Rajesh	49	MALE	09-12-2018	24-09-2018	YES	1	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIOPLASTY	OMENTUM	PAIN
54	83594	Chelladurai	70	MALE	21-12-2018	30-12-2018	YES	> 3 YEARS	YES	< 24 HOURS	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
55	84509	Sankara subbu	63	MALE	25-12-2018	12-08-2018	YES	1	YES	> 48 HOURS	YES	YES	YES	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	SEROMA
56	81984	Manickaselvam	54	MALE	26-12-2018	12-12-2018	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
57	12650	Karthik	21	MALE	10-01-2019	19-01-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	OMENECTOMY AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
58	5788	Sankarammal	53	FEMALE	15-01-2019	30-01-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN

59	3473	Saraswathi	55	FEMALE	16-01-2019	27-01-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	NO	NO	NO	YES	NO	YES	YES	YES	YES	NO	NO	IRREDUCIBLE LEFT FEMORAL HERNIA	FEMORAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
60	7067	Gurusamy	61	MALE	19-01-2019	28-01-2019	YES	1	YES	24-48 HOURS	NO	NO	YES	NO	NO	YES	YES	YES	YES	YES	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	SEROMA
61	5625	murugan	49	MALE	23-01-2019	02-03-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	IRREDUCIBLE RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
62	6111	vellaisamy	37	MALE	25-01-2019	02-04-2019	YES	> 3 YEARS	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
63	7089	vijayaraj	48	MALE	29-01-2019	02-07-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
64	29.01.19	fathima	52	FEMALE	29-01-2019	02-09-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN

65	14726	Mariappan	48	MALE	03-02-2019	03-12-2019	YES	> 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	NONE
66	10030	subammal	50	FEMALE	10-02-2019	18-02-2019	YES	1	YES	> 48 HOURS	YES	NO	YES	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
67	17654	Petta	65	MALE	10-02-2019	22-02-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	PAIN
68	15754	Esakki	52	MALE	10-02-2019	19-02-2019	YES	1 - 3 YEARS	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	SEROMA
69	6056	Lakshmi	36	FEMALE	12-02-2019	19-02-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	SEROMA
70	8253	Ponraj	75	MALE	02-03-2019	14-02-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
71	17635	Nathan	20	MALE	09-03-2019	29-03-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN

72	17548	Balasubramanian	50	MALE	09-03-2019	19-03-2019	YES	1	YES	24-48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	SEROMA
73	17817	Petchiammal	70	FEMALE	10-03-2019	23-03-2019	YES	> 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
74	125644	Esaki_	56	MALE	10-03-2019	19-03-2019	YES	1	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	SEROMA
75	18338	bazir ahamed	28	MALE	12-03-2019	23-03-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
76	18920	paramasivan	55	MALE	14-03-2019	28-03-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	HERNIAL CONTENT REDUCTION AND ANATOMICAL REPAIR	OMENTUM AND INTESTINE	PAIN
77	17624	soosaiparaja	36	MALE	18-03-2019	02-04-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	SEROMA
78	15237	Stella	39	FEMALE	19-03-2019	02-04-2019	YES	1 - 3 YEARS	YES	> 48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN

79	17549	Bala	34	MALE	19-03-2019	30-03-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	NO	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	WOUND GAPING
80	20472	nazer	56	MALE	20-03-2019	01-04-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	NO	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	NONE
81	20687	Palavesam	50	MALE	21-03-2019	04-02-2019	YES	> 3 YEARS	YES	> 48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
82	22698	Mariyasamy	70	MALE	29-03-2019	04-12-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	COLON	SEROMA
83	970	Chellapa	74	MALE	01-04-2019	14-04-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	YES	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA
84	24399	sweetey	25	FEMALE	04-04-2019	12-04-2019	YES	1 - 3 YEARS	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
85	25681	Esakkimuthu	61	MALE	04-04-2019	18-04-2019	YES	1 - 3 YEARS	YES	> 48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	SEROMA

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86	24498	murugan	60	MALE	05-04-2019	10-04-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	NONE
87	24664	sudali muthu	55	MALE	05-04-2019	12-04-2019	YES	1	YES	24-48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
88	17676	Madharaji	50	FEMALE	09-04-2019	19-04-2019	YES	1	YES	> 48 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	NO	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	PAIN
89	17659	Valliyammal	56	FEMALE	10-04-2019	19-04-2019	YES	1	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED LEFT FEMORAL HERNIA	FEMORAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
90	7000	Fathima	52	FEMALE	12-04-2019	23-04-2019	YES	1	YES	< 24 HOURS	YES	YES	NO	YES	NO	YES	YES	YES	YES	NO	OBSTRUCTED UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
91	17810	kathumalai__	38	MALE	13-04-2019	22-04-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED RIGHT INGUINAL HERNIA	INGUINAL	RIGHT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN

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92	17544	Jithan	50	MALE	13-04-2019	22-04-2019	YES	> 3 YEARS	YES	< 24 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
93	27419	Subramani	65	MALE	16-04-2019	29-04-2019	YES	> 3 YEARS	YES	24-48 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	IRREDUCIBLE UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM	PAIN
94	7065	Shiva	39	MALE	19-04-2019	28-04-2019	YES	1	YES	> 48 HOURS	YES	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
95	28836	Sundari	55	FEMALE	22-04-2019	05-06-2019	YES	1	YES	24-48 HOURS	YES	YES	NO	NO	NO	YES	YES	YES	YES	NO	IRREDUCIBLE UMBILICAL HERNIA	UMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
96	8673	Rajendhiran	49	MALE	02-05-2019	02-12-2019	YES	1	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	INTESTINE	PAIN
97	17638	Ram__	32	MALE	12-05-2019	21-05-2019	YES	> 3 YEARS	YES	< 24 HOURS	NO	NO	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN

98	8293	Ponraj	83	MALE	18-05-2019	29-05-2019	YES	1	YES	< 24 HOURS	YES	NO	NO	NO	NO	YES	YES	YES	YES	NO	OBSTRUCTED LEFT INGUINAL HERNIA	INGUINAL	LEFT	HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
99	4952	Thangaiyah	52	MALE	24-05-2019	02-06-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	NO	NO	NO	NO	YES	YES	YES	NO	NO	OBSTRUCTED PARAUMBILICAL HERNIA	PARAUMBILICAL	NOT APPLICABLE	RELEASE OF ADHESIONS AND HERNIAL CONTENT REDUCTION AND HERNIORRAPHY	OMENTUM AND INTESTINE	PAIN
100	25453	Subbammal	60	FEMALE	04-06-2019	22-06-2019	YES	1 - 3 YEARS	YES	< 24 HOURS	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	STRANGULATED INCISIONAL HERNIA	INCISIONAL	NOT APPLICABLE	OMENTECTOMY AND BOWEL RESECTION ANASTOMOSIS AND HERNIORRAPHY	INTESTINE	PAIN