Adult groin hernias: acute and elective

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Abstract

Groin hernias are a common general surgical condition and inguinal hernias will affect over a quarter of the male population in their lifetime. As a consequence, inguinal hernia repair remains one of the most frequently performed general surgical procedures carried out in the UK, at a cost of £100 million to the National Health Service per annum. Although hernia-related complications are relatively rare, they may be catastrophic and repair is recommended because of the potential functional consequences for the patient and the impact on quality of life. These issues need thorough consideration when deciding upon treatment, particularly in reference to the suitability of the patient, the nature of the hernia to be repaired and the type of surgical approach to be utilized. As with many other areas in medicine, improved outcomes in hernia surgery are achieved by experienced high-volume operators with a specialist interest in the condition. This is particularly the case with laparoscopic hernia surgery, which when introduced was associated with significant complications, and continues to have a steep learning curve. In light of the prevalence of the condition and the potential morbidity associated with hernia treatment, these factors have important global socio-economic implications.

Keywords Femoral hernia; hernia repair; inguinal hernia; laparoscopic repair; postoperative pain; recurrence

Introduction

Abdominal wall hernias are common, with a prevalence of 4% for those over 45 years of age. Inguinal hernias account for three-quarters of these abdominal wall hernias and their repair is one of the most frequently performed operations in general surgery. It is estimated that 20 million inguinal hernia repairs are performed annually worldwide. Men have a 27% lifetime risk of inguinal hernia and women a 3% risk. In 2015/16, 62,189 primary inguinal hernia repairs were recorded, with a further 5217 procedure performed for recurrent hernias. Femoral hernias are less common than inguinal hernias and 1527 primary procedures were recorded in 2015/16. Femoral hernias are much more prevalent in females, but inguinal hernias are still the most common type of groin hernia in women.[1]

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In the UK, approximately 85% of groin hernias are repaired by open techniques. The National Institute of Health and Care Excellence (NICE) published their updated guidance on laparoscopic surgery for inguinal hernias in 2004. They recommend that laparoscopic surgery should be one of the treatment options for the repair of inguinal hernias. They recommend that patients should be fully informed of the risks and benefits of laparoscopic surgery. During the course of discussion between surgeon and patient, particular attention should be made to the suitability of the patient for general anaesthesia, the nature of their hernia (primary, recurrent, bilateral) and the experience of the surgeon in the techniques of hernia repair. The NICE guidelines stipulate that laparoscopic inguinal hernia repairs should only be performed by appropriately trained surgeons who regularly carry out the procedure.[2] Operative experience and volumes also affect outcomes in open surgery. Surgeons who perform in excess of 25 open repairs per year have lower recurrence rates than those performing less than 25 procedures annually.

Aetiology

An inguinal hernia is a protrusion of the peritoneum with or without its contents, that occurs through the muscles of the anterior abdominal wall at the level of the inguinal canal in the groin. The definition of a femoral hernia is similar but occurs through the femoral ring into the femoral canal. The precise description of the anatomy is dealt with in a separate chapter in this edition.

The aetiology of groin hernias is multifactorial. It is commonly believed that indirect inguinal hernias are caused by failure of the processus vaginalis to close (Figure 1). Between 1% and 3% of newborn males have an inguinal hernia; the incidence is 30 times greater in prematurity than at term, and is more frequently found on the right side. This structural anomaly alone is not the sole cause for hernia formation, since up to a third of males with a patent processus vaginalis do not have a clinically apparent hernia. Pathological changes in the connective tissue of the abdominal wall are thought to be central to the aetiology of groin hernias, there is biological evidence of protease-antiprotease imbalance and defective hydroxylation of proline resulting in weakened fibroconnective tissue. There is evidence that in subjects with abdominal wall hernias, there is a preponderance of type II collagen over type I collagen, which results in a reduced tensile strength and mechanical stability of the connective tissue.

In adults, age and male gender are the leading predisposing risk factors. Chronic cough and manual labour are conventionally thought to be risk factors due to increased intra-abdominal pressure. However, studies have not been able to confirm this, since the incidence of herniation in sedentary and manual workers is similar. Chronic obstructive airways disease, ascites, peritoneal dialysis, obesity and smoking are additional risk factors. A previous low appendicectomy incision is also a risk factor, thought to be due to the disruption of the integrity of the 'shutter mechanism' of the deep inguinal ring.

Presentation

Patients with a groin hernia most commonly present to their primary care physician, complaining of a lump that has appeared

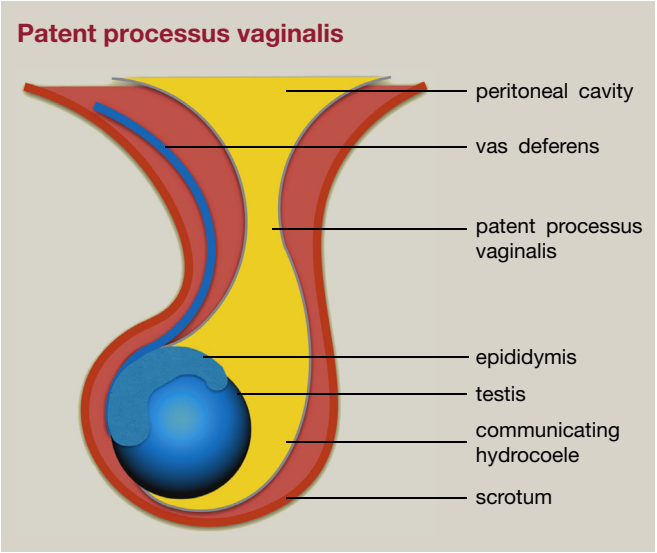

Figure 1

in the groin. This swelling often disappears with minimal pressure or when lying flat. Most cause mild to moderate discomfort, which tends to worsen with movement and physical activity or with sudden rises in intra-abdominal pressure, for example when coughing or sneezing. A third of patients undergoing inguinal hernia repair have no pain, whereas severe pain is extremely rare (occurring in 1.5% of patients at rest and 10.2% during activity).[3] Sometimes it is not possible to reduce the contents of the hernia back into the abdominal cavity. This is known as incarceration, which can lead to intestinal obstruction and ischaemic necrosis of the intestine, known as strangulation. These hernias tend to present directly to hospital and emergency repairs make up 5% of primary groin hernia repairs performed annually. Older age and longer duration of the hernia and irreducibility are risk factors for hernia complications. It is estimated that the lifetime risk for strangulation in an 18 year old is in the region of 0.27% and for a 72 year old man, 0.03%.[1]

Examination and clinical assessment

It is important to carefully examine a groin hernia to confirm the diagnosis. This can nearly always be achieved clinically, with physical examination having a sensitivity and specificity of 92% and 93%, respectively. Differential diagnoses may include lumps arising from the spermatic cord and scrotum such as a hydrocele, hydrocele of the cord, a varicocele, a testicular tumour or, rarely, an ectopic testis. More laterally an enlarged groin lymph node or a saphena varix can catch out the unwary, particularly in regard to a femoral hernia. In patients with pain but without a typical swelling, consider other conditions such as adductor tendinitis, bursitis iliopectinea, pubic osteitis, radiating low back pain, hip arthrosis and endometriosis (Table 1).

Examination for a groin hernia should always be performed with the patient both lying and standing. Often a small hernia is only evident when upright, demonstrate that the swelling has a cough impulse. Always complete an abdominal examination when the patient is supine and due to the high incidence of bilateral hernias, the contralateral groin should always be checked.

Causes of groin swelling and pain

Causes of groin swellings	Causes of groin pain
• Varicocele	• Adductor tendinitis
• Testicular tumour	• Bursitis iliopectinea
• Ectopic testis	• Pubic osteitis
• Enlarged groin lymph node	• Radiating low back pain
• Saphena varix	• Hip arthritis
	• Endometriosis

Table 1

Differentiating the type of hernia using landmarks is useful for distinguishing inguinal from a femoral hernia. Classically, an inguinal hernia protrudes through the superficial inguinal ring superomedial to the pubic tubercle, whereas a femoral hernia protrudes inferolateral to the pubic tubercle. In clinical practice, the superficial ring may be distorted and the hernia large, making it difficult to accurately reference the swelling to the pubic tubercle. Surgical dogma involves attempting to determine whether an inguinal hernia is indirect (via the deep inguinal ring and lateral to the inferior epigastric artery) or direct (through the posterior wall of the inguinal canal and medial to the inferior epigastric artery). Typically, this involves reducing the hernia and attempting to prevent re-herniation on coughing using digital pressure over the deep inguinal ring. In practice this distinction has no clinical relevance as the surgical approach is the same regardless of the sub-type and the test is notoriously unreliable.

A patient presenting acutely but with a short history of incarcerated inguinal hernia may often have the hernia manually reduced to avoid an emergency operation. Typically, this involves giving the patient effective analgesia, such as intravenous morphine to help relax the abdominal musculature, nursing the patient in the Trendelenburg position and, once the analgesia is working, gently massaging the hernia back into the abdomen. Where there is a strong suspicion of strangulation this practice should be avoided and the patient listed for emergency surgery. Signs of strangulation include erythematous skin changes around the lump in reaction to ischaemic bowel within the hernia sac and acute tenderness.

Femoral hernias are rarely reducible and if tender or obstructing, warrant emergency surgery. When reducing any hernia there is a risk of 'reduction-en-masse'. This occurs when the hernia sac and its contents are returned to the abdominal cavity but the contents remain incarcerated within the sac, causing ongoing obstruction or strangulation.

Classification of hernias

There have been a number of attempts to develop a unified classification system for abdominal wall hernias to allow the analysis and comparison of scientific data and clinical studies, which in turn would allow the choice of repair to be more evidence based. A number of eponymous classification systems have been described, notably the Nyhus classification. These systems have not been universally utilized in clinical practice because of difficulties in recalling the system and the grading may be biased by surgeon subjectivity. More recently the