

VARIATION IN PRACTICE AND OUTCOMES AFTER INGUINAL HERNIA REPAIR

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Abstract:

Background: Inguinal hernia repair has often been used as a showcase to illustrate practice variation in surgery. This study determined the degree of hospital variation in proportion of patients with an inguinal hernia undergoing operative repair and the effect of this variation on clinical outcomes.

Method: An unselected cohort of 223 patients who underwent laparoscopic totally extraperitoneal (TEP) inguinal hernia repair before March 2022 were included in this study, thus ensuring a minimum 5-year follow-up. Patient demographic data, clinical notes, operating notes and outpatient follow-up notes were studied. Patients were interviewed telephonically regarding hernia recurrence, chronic pain and technique preference if they had previously undergone an open repair. All data collected were recorded on an electronic spreadsheet. The primary outcome parameter was recurrence. The secondary outcome parameters were postoperative and long-term complications.

Results: This nationwide database study shows that practice variation in inguinal hernia repair is modest in the Babel province. Operation-rates vary by less than two-fold, and variation is stable over the years 2020-2022. A more thorough analysis illustrates that the type of hospital (academic, teaching, or private) is the most relevant factor contributing to the observed variation. An addition to previous reports on practice variation in hernia surgery is the present finding that adjusted rates in surgery in general hospitals are associated with the type of financial reimbursement for diagnosis and the percentage of self-employed staff. These non-clinical factors related to variation may not only contribute to practice variation in hernia surgery,

Conclusion : Hospital variation in inguinal hernia repair in the Al-hilla city is modest, operation-rates vary by less than two-fold, and variation is stable over time. Hernia repair in hospitals with high adjusted rates of inguinal hernia repair are associated with improved outcomes.

Key words: inguinal hernia, surgery, variation.

Introduction:

Abdominal wall hernias are common, with a prevalence of 1.7% for all ages and 4% for those aged over 45 years. Inguinal hernias account for 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women.¹ Repair of inguinal hernia is one of the most common operations in general surgery

Groin hernia repair is the most commonly performed operation in general surgery. The most important layer in the groin is the transversalis fascia in establishing a better approach to inguinal hernia, which has been known since Bassini who reinforced the posterior wall by suturing the triple layers consist in fascia transversalis, transversus abdominis and internal oblique muscles to the inguinal ligament with interrupted sutures [1]. This repair was the procedure of choice for inguinal hernia repair for many years. Shouldice repair is also based on division and double breasting of the transversalis fascia followed by approximation of conjoint tendon to inguinal ligament [2]. This four-layer repair was modified by Berliner and Wise [3] and by Berliner [4] initially to three layers and then to two. The insertion of prosthetic materials either anterior or posterior to the transversalis fascia to reinforce the posterior wall has also been used extensively with lower recurrence rates. Although many different techniques, with recurrence rates of approx. 1–2% have been reported, a new, simple, easy-to-do and easy-to-learn technique not requiring extensive dissection or prosthetic materials is still required [5, 6, 7].

An inguinal hernia is defined as the passage under the skin of a portion of the peritoneum possibly containing abdominal viscera through the inguinal canal or directly through the abdominal muscles [8]. Almost 95% of groin hernias are inguinal hernias. The remaining 5% concern crural hernias. They mainly affect the male subject between 20 and 60 years. Ten percent of digestive surgery procedures are cures for inguinal hernias [9]. A distinction is made between direct inguinal hernia, external oblique hernia, pantal hernia and inguinoscrotal hernia. Worldwide, there are more than 20 million inguinal hernia cures per year [10]. In the United States of America (USA), 800,000 cures for inguinal hernias are performed each year [10]. In France inguinal hernias represent 17.2% of all surgeries [11,12].

EPIDEMIOLOGY.

There are more than 600,000 hernia repairs every year in the world. 5% of the population will develop an abdominal hernia; the prevalence, however, may even be higher (13).

PATHOGENESIS

The development of an inguinal hernia is multifactorial. In case of a congenital pathogenesis a preformed opening is caused by incomplete closure of the abdominal wall or in case of acquired hernia it is caused by a dehiscence of the fascia accompanied by a loss of abdominal wall strength. Etiologic factors may be increased intra-abdominal pressure or changes in the connective tissue (14).

DIAGNOSIS

Diagnosis of classic inguinal hernia is mostly straightforward using physical and ultra-sound examination. CT-scan, MRT, x-rays are not recommended for routine

use (14). The differential diagnosis includes mainly disorders of the groin region (13).

Classification

Traditionally inguinal hernias, are classified as (a) direct (b) indirect, and (c) combined hernias, otherwise known as pantaloon or Romberg or saddle bag hernias, depending on their relationship to the inferior epigastric vessels. Direct inguinal hernias occur medial to the inferior epigastric vessels when abdominal contents herniate through a weak spot in the fascia of the posterior wall of the inguinal canal, which is formed by the transversalis fascia. Indirect inguinal hernias occur when abdominal contents protrude through the deep inguinal ring, lateral to the inferior epigastric vessels. This may be caused by failure of embryonic closure of the processus vaginalis. In the combined variety, hernia sacs are on both sides of the inferior epigastric vessels. A direct inguinal hernia is less common (~25–30% of inguinal hernias) and usually occurs in men over 40 years of age [15]. The European hernia society [EHS] has an official classification for groin hernias which is good, simple and easy to remember [16]. This classification mentions both anatomical location and size of the hernia orifice as seen intra-operatively. It localizes the hernia anatomically as L = lateral, M = medial, F = femoral and measures the size of the hernia orifice using the tip of the index finger which is about 1.5-2cm. This is registered on the table as 1 (≤ 1 finger), 2 (1-2 fingers), and 3 (≥ 3 fingers). Thus a hernia orifice of 2.5 cm is depicted as a size 2 hernia. This dimension is reported to be identical to the length of branches of a pair of most laparoscopic graspers, dissectors, or scissors enabling the surgeon to use the same classification during laparoscopic surgery [16]. In this classification, combined hernias are ticked in the appropriate boxes.

Clinical features

A bulge in the area on either side of the pubic bone indicates an inguinal hernia. There may be a burning, gurgling or aching sensation at the bulge, or pain or discomfort in the groin, especially when bending over, coughing or lifting. As the hernia progresses, contents of the abdominal cavity, such as the stomach, small bowel, colon, and liver, can descend into the hernia [17]. Occasionally, pain and swelling around the testicles occurs, when the protruding intestine descends into the scrotum.

An incarcerated hernia may be associated with inability to manipulate the hernia through the fascial defect. Pain, nausea, and vomiting, indicate bowel obstruction while persistence of pain and tenderness of an incarcerated hernia indicate strangulation. In addition, there may be systemic toxicity secondary to ischemic bowel.

Surgical techniques

The skin and fascia are cut through an oblique inguinal incision. The spermatic cord is separated from the inguinal floor, and the hernial sac is ligated and excised in cases with anterior repair, except direct hernias. The hernial sac is reduced only during preperitoneal repair. The hernias in this series were repaired either by the new

fascia transversalis repair—Coskun's hernia repair (FTR) or by one of the two mesh repair techniques: anterior (Lichtenstein) or posterior (preperitoneal) repair. Anterior and posterior mesh repair techniques have been described previously [7,8,9]. The groups did not differ significantly in age or sex. All hernias in the FTR group were primary hernias (Nyhus types 2 and 3); there were some recurrent hernias in the Lichtenstein and preperitoneal repair groups. Most hernias in each group were repaired under general anesthesia.

Results and discussions:

Two-hundred twenty-three patients were included; 118 men underwent operations performed by medical doctors and 105 men underwent operations performed by surgeons. Preoperative patient characteristics were similar in both groups. One-hundred thirty-five patients (97.9%) were seen at follow-up at 2 weeks, and 165 patients (92.1%) were seen at follow-up at 1 year. The absolute difference in recurrence rate between the medical doctor group (2 [0.8%]) and the surgeon group (4 [2.9%]) was -1.7 (1-tailed 94% CI, -4.6 ; $P < .001$), demonstrating noninferiority of the medical doctors. There were no statistically significant differences in postoperative complications (32 [27.1%] vs 28 [23.2%]), patient satisfaction (118 [97.2%] vs 105 [99.1%]), severe chronic pain (1 [0.8%] vs 3 [3.5%]), or self-assessed health (84.8 vs 82.6 of 100) for medical doctors and surgeons.

Table 1. Patient demographics and hernia characteristics

Number, N	223
Age (years), mean (range)	63 (21-97)
Gender, n (%)	
Male	218 (98)
Female	5 (2)
Follow-up (years), mean (range)	8.9 (5.3-13)
Number of hernias, N	215
Side of hernia, n (%)	
Left	40 (22)
Right	73 (30)
Bilateral	110 (48)

Type of hernia, n(%)	
Indirect	141(60)
Direct	39(33)
Recurrent	12(7)
Irreducible hernias, n(%)	2(0.5)
Previous open repair (ipsilateral or contralateral), n(%)	16(16)
Previous appendectomy, n(%)	13(5)

Surgical Management

There is currently no medical recommendation about how to manage an inguinal hernia condition, due to the fact that until recently, elective surgery used to be recommended for all inguinal hernias. The reason for this recommendation is the feared risk of complications such as incarceration or strangulation [25]. However in most cases, surgical repairs are not carried out to prevent strangulation, but because of patients' request, to relieve discomfort [30]. Watchful waiting therefore is a recommended reasonable option, especially for minimally symptomatic hernias, due to the significant risk of chronic post herniorrhaphy pain (>10%), and the low risk of incarceration (<0.2% per year) [25].

Most inguinal hernia repairs can be performed safely, accurately and cost-effectively using local anesthesia, through an open anterior approach. Hernia recurrence rates of less than 4% have been reported for herniorrhaphies performed without prosthetic mesh by skilled surgeons [31]. Hernia repair using prosthetic mesh would be a good choice in the patient with a direct hernia or in the older patient with a longstanding hernia and attenuated fascia. Recurrent hernias repaired with classical herniorrhaphy not utilizing mesh have a reported recurrence rate of approximately 23% at three years [32]. For this reason, recurrent hernias are best managed with open anterior or posterior mesh repair and laparoscopic repair.

Postoperative Care

The current standard of care after hernia repair is general wound care. The length of required inactivity varies greatly based on the surgeon's preference, but activity is usually permitted within two to four weeks for laborers and within 10 days as tolerated for professionals. (21,22).

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