

# Recurrent Inguinal Hernia (A Descriptive Study on Etiology & Management)

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## Abstract

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**Background:** Recurrent inguinal hernia constitutes a significant problem for the surgical community. Incidence of recurrence and chronic groin pain after hernia repair require continuous audit, participation in a register and follow-up by selective physical examination provides a solid basis for quality control.

**Objective:** Description of cases with recurrent inguinal hernia, type of previous repair, factors contributed to recurrence of hernia and type of repair used with the study of post-operative complications in the early postoperative period.

**Patients and Methods:** Descriptive studies on patients with recurrent inguinal hernia were evaluated and data collected.

History; age, occupation, time of previous operation, predisposed factors extracted from the previous operation and change of lifestyle. General examination; the presence of predisposing factors, comorbid factors, obesity. Local examination: to describe the type of hernia. Local examination: to describe the type of hernia.

**Results:** In our study 18(40%) patients had an indirect recurrent hernia, 24 patients with recurrent direct inguinal hernia, and 3 patients presented with pantaloon hernia. Males constitute 93.33% of cases. Smoking and chronic cough were the most common predisposing factors. The right side constitutes 80% of cases and the other 20% on the left side. The interval between the previous operation and clinical presentation of recurrence is the highest number presented after 2-5 years.

**Conclusion:** Mesh repair was superior to other types of repair (less no. of patients with previous mesh repair and less post-operative complications).

**Keywords:** Hernia; Inguinal; Herniorrhaphy; Hernioplasty; Prolene mesh; Hesselbach's triangle

## Introduction

### History

The word "hernia" is derived from a Latin term meaning "a rupture." The earliest reports of abdominal wall hernias date back to 1500 BC. The first evidence of operative repair of inguinal hernia dates to the first century AD. Bassini revolutionized the repair of the inguinal hernia surgically. He first

performed his operation in 1884, and published his initial outcomes in 1889. Darn repairs were first introduced in the early 20<sup>th</sup> century to reduce wound tension by using either autologous tissue or synthetic suture to bridge the gap between fascial tissues. McVay further popularized Cooper's

ligament repair with the addition of a relaxing incision to reduce the increased wound tension. The use of autologous or synthetic patches was also attempted to reduce wound tension and improve rates of recurrence. The first patches began in the early 20<sup>th</sup> century.

Usher introduced a modern synthetic patch made of a plastic monofilament polymer (polyethylene) in 1958. Lichtenstein, who developed a sutureless hernia repair using a plastic mesh patch placed across the inguinal floor, further popularized this technique. In 1958 Shouldice technique was initially introduced, and in essence a modification of the Bassini operation. The laparoscopic techniques have been validated as effective and safe in the treatment of inguinal hernias and have become commonplace now[1].

### Recurrence

Marsden defined a recurrence post-surgical hernia repair as a weakness of the operation area necessitating a further operation or the provision of a truss (Marsden's definition). Specialist centers reported 1 to 5%. United States audit figures reported a rate of recurrence of approximately 10% for primary inguinal hernia repaired. 50% of patients after hernia surgery are unaware of a recurrence. Recurrences can appear at any time up to 25 years after surgery. Most hernias that recur do so within 5 years; 25% of recurrences have arisen at 2 years, 60% by 5 years, and 75% by 10 years[2]. Recurrence rates from specialty centers performing either laparoscopic or conventional tension-free repairs are 2% or less now routinely reported. A recent study from the VA reported a higher recurrence rate at 2 years (4% for Lichtenstein and 10% for laparoscopy) and

may be more reflective of the general population outside of specialty centers [3].

### Causes of Recurrence

1. Body Build. 2. Systemic factors, such as coincidental disease; anemia; and recent weight loss and debility. 3. Type of Work. 4. Local Factors: (Tension tissues repaired, the size of the hernia defect, an emergency operation, smoking, other factors; breaking of sutures, interposition of fat or muscle, the failure of incomplete removal of the sac; the presence of hematoma, infection, nerve injury and postoperative cough) [4].

### Aims of Study

1. Study the predisposing factors determining relative risk for reoperation after inguinal hernia repair.
2. Evaluate the methods of the previous repair depending on the patient's record.
3. The methods of repair used in recurrent cases and their post-operative complaints.

### Patients and Methods

**Patients involved in the study were evaluated preoperatively. Data collected include:**

#### History

Age, occupation, time of previous operation, factors extracted from the previous operation (presence of wound infection, bleeding and hematoma, surgical interference in the immediate post-operative period of the previous operation, long follow-up due to the presence of infection or sinuses) and change of lifestyle.

#### General examination

The presence of predisposing factors such as dyspnea, asthma, chronic constipation, difficulty in maturation, immunocompromised diseases (anemia,

chemotherapy) , obesity and chronic illnesses.

**Local examination**

To describe the type of hernia (small or large), the presence of hernia on the other side.

All patients were investigated by:

- 1.CB P, Hb. , PCV, WBC.
- 2.B. urea, S. creatinine as indicated in those over 45 years.
- 3.F.B.S in diabetic and those over 45 years.
- 4.Chest X-ray as required.
- 5.ECG as required

Patients were operated on under general anesthesia by the juniors and specialist surgeons. Post-operative complications were observed such as post-operative respiratory complications, infection and hematoma.

**Statistical Analysis**

The descriptive statistics used including frequency and frequency percentage were performed in data analysis. The results were reported with  $p \leq 0.05$  or  $p \geq 0.01$  as the accepted level of significance accordingly.

Comparisons were made using the Chi x2 test using standard equations.

**Results**

Forty-five patients with recurrent inguinal hernias were involved in our study and were operated on during the period between January 2009 to December 2010 at Al-Yarmouk Teaching Hospital. Twenty- nine patients were operated in the general surgery theater and sixteen in urosurgical department. In this study we classified the involved cases according to age as shown in Table (1).

Group 1 age < 5 years (5) patients (11.11) %.

Group 2 age 5-15 years 7 patients 15.55%.

Group 3 age 15-50 years (15) patients 33.33%.

Group 4 age >50 years (18) patients 40%.

This means that patients in childhood <15 years old constitute 26.6% of the total number and those of age >50 constitute the highest number of 18(40%) cases. The mean age was 43 years.

**Table (1):** Classification of patients according to age

Group	Age (y)	No.	%
Group 1	< 5	5	11.11%
Group 2	5-15	7	15.55%
Group 3	15-50	15	33.33%
Group 4	>50	18	40%

Concerning the gender 42(93.33%) patients were males and 3(6.66) were females Table (2).

**Table (2):** Gender distribution of patients

Gender	No.	%
Male	42	93.33
Female	3	6.66

The interval between the previous operation and the presentation for operation is shown in Table (3) which shows that the highest

number of patients presented between 2-5 years from the previous operation and recurrence 16 (34.55%).

**Table (3):** Interval between previous operation and clinical presentation at time of operation

Time in year	No.	%
<2	11	24.44
2-5	16	34.55
5-10	12	26.66
>10	6	13.33

The risk factors that could play a major role for recurrence of inguinal hernia are shown in Table (4).

**Table (4):** The predisposing factors of recurrent inguinal hernia

Predisposing factors	No.	%
History of lifting heavy weight	10	22.22
Smoking habits	22	48.88
Chronic cough	20	44.44
Diabetes Mellitus	16	35.55
Urine out flow obstruction	16	35.55
Constipation	11	24.44
Obesity	9	20

It has been found that 18 (40%) of patients has a family history of inguinal hernia, 10 (22.22%) patients have history of lifting heavy weight, 22 (48.88%) patients were smokers, 20 (44.44%) presented with a history of chronic cough, 16 (35.55 %) were diabetic, 16 (35.55%) had urine outflow obstruction, 11 (24.44%) were had a history

of constipation and 9 (20%) patients were obese. Nine (20%) patients had a history of local wound complication (hematoma or wound infection) at a previous operation. On clinical examination 36 (80%) patients had right recurrent inguinal hernia and the remaining 9 (20%) patients had left recurrent inguinal hernia as shown in Table (5).

**Table (5):** Side of recurrent hernia

Side	No.	%
Right	36	80
Left	9	20
Bilateral	0	0

Surgical finding 24 (53.33%) patients had a direct hernia. 18 (40%) patients had an

indirect hernia and 3 (6.66%) patients had pantaloons type.

**Table (6):** Type of recurrent hernia

Type of hernia	No.	%
Direct	24	53.33
Indirect	18	40
Pantaloon	3	6.66

Repair of the previous operation depends on the patient's record and operative finding during the recent repair.

Herniotomy was done previously in the first & second groups. All patients in groups 3 and 4 were repaired by nylon suture (darn) tissue repair apart from 3 patients who had Lichtenstein mesh repair so the recurrent mesh repair represents 6.66% only.

**Method of repair**

For group 1 all were of the indirect type of hernia and herniotomy was done with narrowing of the internal ring.

For group 2 all were of the indirect type of hernia and herniotomy was done with

narrowing of the internal ring and tissue repair by nylon (darn) method for 3 cases only.

For group 3 Tissue repair by darning with nylon for 5 cases and mesh repair for 10 cases.

For group 3 Tissue repair by darning with nylon for 5 cases and mesh repair for 10 cases.

**Post-operative complications**

Patients were followed up for three months and some complications were noted for each type of repair as shown in Table (7).

**Table (7):** Early post-operative complications according to the type of repair

	Type of repair	Herniotomy (9)	Herniotomy (darn) Repair (11)	(darn) repair (5)	Mesh Repair (20)	Total No. & (%)
Complication						
Wound infection		0	2	2	1	5 (11.11%)
Hematoma		0	2	1	3	6 (13.33%)
Seroma		0	5	1	3	9 (20%)
Urinary complaint		0	3	1	4	8 (17.77%)
Postoperative pain		1	4	2	3	10 (22.22%)
Scrotal swelling		3	2	1	1	7 (15.55%)

**Discussion**

Recurrence was the only criterion by which the quality of a hernia repair was measured. Before the mesh techniques were introduced, over 15% of primary repairs were accepted recurrence rates. Dramatic reduction of recurrence rates has been demonstrated following the growing acceptance of non-

absorbable implants and their wider use both in open and endoscopic repairs. In our study we had 12 patients out of 45 with an indirect hernia in age groups 1 and 2 (less than 15 years) this is considered a large number of recurrence in such an age group. In addition to some patients in groups 3 and 4 with an indirect hernia (total of 18 patients), The

obvious causes of indirect recurrence can be due to operative reasons e.g.: missed hernia, low sac ligation and incomplete restoration of the internal ring in addition to predisposing factors post operatively.

A low ligation of the sac would most probably occur because the dissection at the internal ring is incomplete, i.e., not within the abdominal wall; thus the stump of the sac does not retract in addition, an internal purse string or an external purse-string with large bites may leave small openings through which a wedge of omentum or bowel may lead to recurrence. This cause is suggested when remnants of the purse-string are found on one side of the recurrent sac. Complete dissection of the sac at the ring, an external purse string with small bites of the peritoneum, and a distal transfixion suture to the internal ring are advised. Adequate repair of the inguinal ring cannot be secured unless dissection provides a clear definition of the ring as emphasized by several authors including Griffith and Ponka [7,8].

Direct recurrent inguinal hernia constitutes 53.33% of patients. Of those patients (24 patients) while the indirect hernia was 40% (18 patients).the direct hernia was more than the indirect in a study by Bashir which was 78 % [23].

History and physical examination usually are sufficient to rule out pulmonary disease, and the patient receives intensive therapy both preoperatively and postoperatively, to insure a minimum of stress upon the repair. For lower urinary tract disease, history, rectal examination, urinalysis, and residual urine volume have proved to be excellent screening procedures. If abnormalities are found, elimination of lower tract obstruction or

control of cystitis is required and herniorrhaphy is considered only after relief of these urological conditions. The causes of diffuse direct recurrent hernia are seldom apparent. The possibility of an inadequate primary repair is not a satisfactory explanation, although this could be the reason, particularly if meant to indicate fascial layers sutured under excessive tension. The remarkably low recurrence rate after the Shouldice operation may in part be due to suturing with little tension.

Continued degeneration of the fascial layers seems the most probable cause. Peacock and Madden indicate based on their studies that a localized mesenchymal metabolic defect is at fault [9].

The localized defects, most often in the medial portion of Hesselbach's triangle, can best be explained by the cutting action of the suture tied too tightly. Clinical experience suggests that the greatest tension is on the second or third suture lateral to the symphysis, The careful determination of suture tension by read and McLeod appear to confirm this, as well as the advantage of relaxing incision when excessive tension is present [10].

The original objective, however, has led to a better appreciation of the necessity of observing proper technique in the performance of primary inguinal herniorrhaphy. These have been noted in the discussion except for factor implied by Halvorsen and McVay the appropriate primary operation repair must be selected for each patient[11]. Concerning gender (42) 93.33% of patients were males. This may be due to the high incidence of hernia in male also the type of work should be considered.

The interval between the previous operation and clinical presentation of recurrence is the highest number presented after 2-5 years. The recurrence after 2 years or suggests the progression of the disease that caused the initial hernia [12] But still some of our patients may have signs of recurrence before it was recorded. Different surgical procedures were done for our patients according to the preference of surgeons and the availability of materials. We did herniotomy for 9 patients, herniotomy and darn repair for 12 patients, darn repair for 5 patients and mesh repair for 20 patients.

All patients were followed for 3 months and some complications were noted for each type of repair. Post-operative pain was noted in 10 patients distributed as 4/12 patients with herniotomy and darn and 3/20 patients with mesh repair and 2/5 patients with darn repair and 1/9 patients with herniotomy. This means that mesh repair had the lowest percentage. Seroma has been noted in 9 patients distributed as 5/12 patients with herniotomy and darn, 3/20 repaired patients with mesh and 1/5 patients with darn. Mesh repair seems to cause less percentage of post-operative seroma.

Urine outflow obstruction was noted in 8 patients, scrotal swelling was noted in 7 patients, the hematoma was noted in 6 patients and wound infection was noted in 5 patients Mesh hernioplasty represent valuable progress in inguinal hernia therapy, but the critical conditions for good results are an experience of the surgeon in the surgical technique, adequate inguinal ring reconstruction and suture of a wide mesh to the surrounding tissues [13]. We can solve every anatomical situation in hernia

recurrence and good results, with little or no complications, are achievable by Lichtenstein "mesh" hernioplasty.

A study from Italy compared three techniques (Bassini, Lichtenstein, and preperitoneal prosthesis) lower recurrence was noted in the last technique [15]. The study from Pakistan concludes also that open preperitoneal repair for recurrent inguinal hernia is a safe procedure. He operated on 55 patients with minimal complications and one recurrence only [16].

Regarding laparoscopic repair, there are different studies in the literature. On one hand they concluded that it is a very efficient method. Others concluded that it has no superior advantage on open mesh repair.

Some concluded that the open technique is superior to the repair of primary hernia than laparoscopic techniques[17]. Regarding open versus laparoscopic repair of recurrent groin hernia, a study by Richards' who operated on 171 patients concluded no difference in the outcome of open versus TEP[18].

Laparoscopic repair is becoming a popular treatment for recurrent inguinal hernias. The effective method that has superior long-term results as compared to the historical of the repair of recurrent inguinal hernia is the laparoscopic approach; if the cost could be reduced, it should probably become the method of choice for the repair of recurrent inguinal hernia [19].

## Conclusions

Recurrent inguinal hernia still constitutes a significant problem for the surgical community. The Inguinal hernia has been studied with particular emphasis on those factors which might have predisposed to

failure of the primary repair. The three major causes of recurrence were:

1. Omission of the preoperative investigation and alleviation of pathological conditions which produce increased intra-abdominal pressure, namely, diseases of the lower urinary tract, cardiopulmonary system, and lower gastrointestinal tract.
2. Errors in operative management and technique.
3. Postoperative complications, especially those of the wound.

### Recommendations

Mesh repair was superior to other types of repair (less no. of patients with previous mesh repair and fewer post-operative complications). We recommend using this method in a hernia that needs herniorrhaphy

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**Ethical clearance:** Ethical approval was obtained from the College of Medicine / University of Diyala ethical committee for this study.

**Conflict of interest:** Nil

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## الفتق المغبني المتكرر ( دراسة وصفية عن العوامل المسببة وطرق المعالجة )

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### المخلص

**خلفية الدراسة:** لا يزال الفتق المتكرر في الفخذ يشكل مشكلة كمية دلالية للمجتمع الجراحي. الحدوث المتكرر وآلام الفخذ المزمنة بعد إصلاح الفتق تتطلب التدقيق الحسابي المستمر وتوفير المراجعة الحسابية والمشاركة في التسجيل والمتابعة عن طريق الفحص البدني الانتقائي أساسا متبنا لمراقبة الجودة .

**اهداف الدراسة:** لوصف الحالات المصابة بالفتق الإربي المتكرر ، ونوع الإصلاح السابق ، والعوامل التي ساهمت في تكرار الفتق ونوع الإصلاح المستخدم مع دراسة مضاعفات ما بعد الجراحة في فترة ما بعد الجراحة المبكرة .

**المرضى والطرائق:** تم تقييم وجمع البيانات في الدراسة الوصفية على المرضى الذين يعانون من الفتق الإربي المتكرر، التاريخ المرضي ، العمر، المهنة ، وقت العملية السابقة ، العوامل المهيأة المستخرجة من العملية السابقة وتغيير نمط الحياة . الفحص العام؛ وجود عوامل معيقة مرضية مشتركة والسمنة الفحص السريري: لوصف نوع الفتق الفحوصات المختبرية وصف طرق الإصلاح تعتمد على النتائج أثناء العملية الجراحية ومضاعفات ما بعد الجراحة .

**النتائج:** في هذه الدراسة ، كان لدى ١٨ (٤٠٪) من المرضى فتق متكرر غير مباشر ، و ٢٤ مريضا يعانون من فتق إربي مباشر متكرر و ٣ مرضى يعانون فتق من الجانبين. ويشكل الذكور ٩٣,٣٣% من الحالات. كان التدخين والسعال المزمن أكثر العوامل المؤثرة شيوعا. يشكل الجانب الأيمن ٨٠٪ من الحالات و ٢٠٪ الأخرى على الجانب الأيسر. الفترة الفاصلة بين العملية السابقة والعرض السريري للتكرار أعلى عدد بعد فترة ٢-٥ سنوات

**الاستنتاجات:** العمليات التي اجريت لإصلاح الفتق باستخدام الشبكة متفوقا على أنواع الإصلاح الأخرى (أقل عددا من المرضى الذين يعانون من إصلاح شبكة سابقة ومضاعفات أقل بعد الجراحة).

**الكلمات المفتاحية:** الفتق ، المنطقة المغبنية ، الإصلاح الفتقي ، الترقيع الفتقي ، شبكة البرولين ، مثلث هاسل باغ

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