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# Pattern of inguinal hernia in Al- Basra teaching hospital: a prospective clinical study

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## ABSTRACT

**Introduction:** Inguinal hernia is the most commonly hernia in both men and women but occurs more common in men. Although there are two basic types of inguinal hernia with differences in anatomy, the etiology, complications, and surgical repair technique of both are very similar. The aim of this study was to evaluate the demographic and clinical characteristics of patients with inguinal hernia who underwent either elective or emergency surgical hernia repair at Al-Basra Teaching Hospital.

**Methods:** This was a prospective clinical study involving patients with inguinal hernia admitted to Al-Basra Teaching Hospital from February 2017 to November 2019. Patient's demographic data, smoking habit, body mass index, history of chronic diseases, family history of inguinal hernia, and post-operative complications were evaluated. The patients were divided into seven groups according to age. All data were recorded and analyzed.

**Results:** A total of 250 patients age 16 to 82 years were included (men, 88.4%, women, 11.6%) in this study. Most of the patients were above the age of 40, nearly half of the patients were smokers and had a positive family history of inguinal hernia. Most patients had normal body weight, and 12% of patients developed postoperative complications.

**Conclusion:** We concluded that a large proportion of patients with inguinal hernia were men and they underwent elective hernia repair. All of patients with recurrent hernia were found to be smokers. Patient who underwent elective hernia repair had minimal postoperative complications with short hospitalization.

## ARTICLE HISTORY

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## KEYWORDS

Inguinal hernia; elective hernia repair; emergency hernia repair; risk factors; demographic; smoking

## 1. Introduction

Inguinal hernia, often referred to as a rupture by patients, is the most common type of hernia in both men and women but occurs more commonly in men [1]. There are two basic types of direct and indirect inguinal hernia that fundamentally differ in their anatomy, causation and complications. However, they are anatomically very close to each other, and have similar surgical repair techniques; the ultimate reinforcement of the weakened anatomy is identical [1].

Inguinal hernias account for 75% of abdominal wall hernias with a lifetime risk of 27% in men and 3% in women [2]. Inguinal hernia repair is one of the most common operations in general surgery with rates ranging from 10 per 100 000 of people in the United Kingdom to 28 per 100 000 in the United States [3]. The aim of this study was to evaluate the demographic and clinical characteristics of patients with inguinal hernia who underwent either elective or emergency surgical hernia repair at the Al-Basra Teaching Hospital.

## 2. Methods

This was a prospective clinical study involving patients with inguinal hernia admitted to Al-Basra Teaching

Hospital, Basra, Southern of Iraq over a three-year period from February 2017 to November 2019. Al-Basra Teaching Hospital is a 600-bedded public hospital in the center of Basra, with 700 to 1000 patients attending the outpatient clinics every day and about 1000–1250 patients attending the emergency unite every day. A total of 250 patients were divided into seven groups according to age, and all the patients were followed up from the time of admission until 4 weeks later. Informed consent was obtained from each patient who enrolled in this study, and the study was approved by the ethics committee. Patients demographic data, smoking habit, body mass index, site of the hernia, and postoperative complications were evaluated and all the data collected using a pre-tested proforma and the data were subsequently analyzed using SPSS version 23 (SPSS Inc. Released 2007. SPSS for Windows, Version 23. Chicago, SPSS Inc.), for data interpretation and statistical analysis.

**Exclusion criteria:** Pediatric patients younger than 16 years of age were exclude from the study.

## 3. Results

A total of 250 patients age 16 to 82 years, with a mean age of 31+ SD 10.61 years were included. Of these, there were

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221 (88.4%) men and 29 (11.6%) women, and male to female ratio was 7.1:1. (Table 1). A total of 227 (91.8%) patients had a primary hernia and 23(9.2%) patients had recurrent hernia as shown in Figure 1.

Most patients 232 (92.8%) underwent an elective hernia repair by Lichtenstein tension-free repair, and 18 (7.2%) patients presented as emergency cases due to complicated hernia underwent modified Bassini's repair. Half the number of patients with complicated hernia had irreducible hernia containing bowel and omentum and other modes of presentation of complicated hernia as shown in Table 2.

Almost half of patients had a normal body mass index, while the other patients were overweight, underweight, or obese (Table 3).

The majority of patients did not develop any postoperative complications, whereas 30 (12%) patients developed postoperative complications, 23 out of 30

patients with postoperative complications underwent emergency repair, and the remaining 7 patients underwent elective repair. Seroma was the main type of postoperative complications observed in 17 (56.66%) patients, and it was mainly reported among obese patients. Twenty-eight (12.33%) patients with primary hernia developed postoperative complications, whereas, 2(8.6%) patients with recurrent hernia had postoperative complications. All these patients with postoperative complications were treated conservatively in the outpatient clinic without any further surgical intervention as shown in Table 4.

The length of hospital stay was 1 to 4 days. Of the total, 159 patients were only admitted for a day, whereas others had a duration of hospitalization, in particular, those patients who underwent an emergency hernia repair with bowel resection and anastomosis and developed postoperative ileus resulting in a drain tube being kept in situ till the time of discharged were hospitalized for a longer duration (Figure 2).

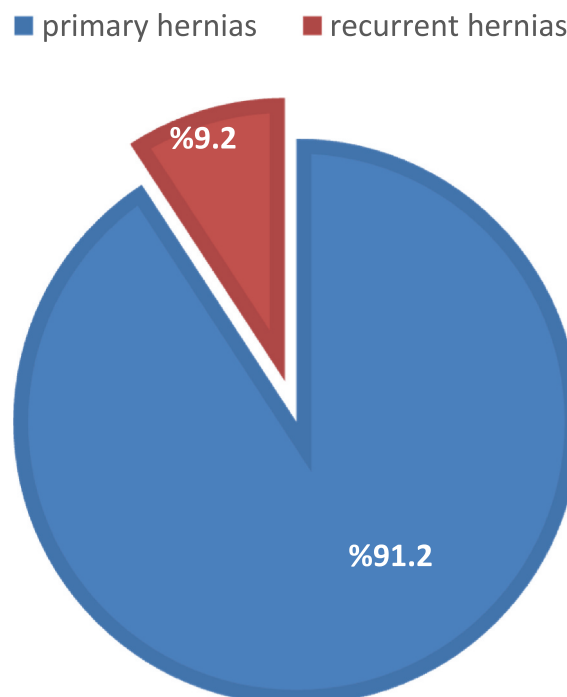
**Table 1.** Patient's characteristics.

Variables	Numbers	Percentage
16–19	21	8.4
20–29	30	12
30–39	39	15.6
40–49	49	19.6
50–59	50	20
60–69	40	16
70+	21	8.4
Males	221	88.4
Females	29	11.6
Rt. sided	150	60
Lt. sided	88	35.2
Bilateral	12	4.8
Smokers	133	53.2
Systemic diseases	58	23.2
family history	52	20.8

#### 4. Discussion

This study found that a large proportion of male patients with inguinal hernia underwent elective hernia repair. All of patients with recurrent hernia found to be smokers. Most patients underwent elective hernia repair and reported few postoperative complications.

Inguinal hernia is a common surgical problem, and the diagnosis is clinical and typical. Patients often aware of their diagnosis because the condition is very common [1]. The surgical repair of inguinal hernia is usually not a complex procedure and it can be performed as



**Figure 1.** Primary and recurrent hernias.

**Table 2.** Frequency and types of complicated hernia.

Types of presentation	No = 18	Percentage
Irreducible hernia	9	50
Obstructed hernia	6	33.33
Strangulated hernia	3	16.66

**Table 3.** Distribution according to body mass index.

Variable	No (%)
Under weight	30 (12)
Normal weight	125 (50)
Over weight	83 (33.2)
Obese	12 (4.8)
Total	250 (100)

**Table 4.** Postoperative complication.

Complications	Total n. = 30 No (%)
Seroma	17 (56.66)
Wound infection	10 (33.33)
Ileus	3 (10)
Hematoma	1 (3.33)
Total	30(100)

a day surgery in case of elective surgery. In case of emergency surgery, most patients hospitalized for one to three days.

In this study, male patients out-numbered female patients, the reason for the male predominance may be the inherent weakness of the abdominal wall where the spermatic cord passes through the inguinal canal, which consistent with the results of other studies [4–7]. We observed that 52 (20.8%) patients had a family history of inguinal hernia. Similar observations were reported in other studies such as those by Lau et al. and Junge et al. who also described a positive family history as an important predictor of inguinal hernia [8,9].

In our case scenario, 64% of the patients were 40 years and above, which is in accordance with observations of other studies [10–12]. Some studies found inguinal hernia to be more common in people age 30 to 49 years and less common among adolescents [13]. In our study, primary hernia was more common than recurrent hernia; 9% of the patients had recurrent hernia in our study, which is consistent with the findings of other studies [10,11].

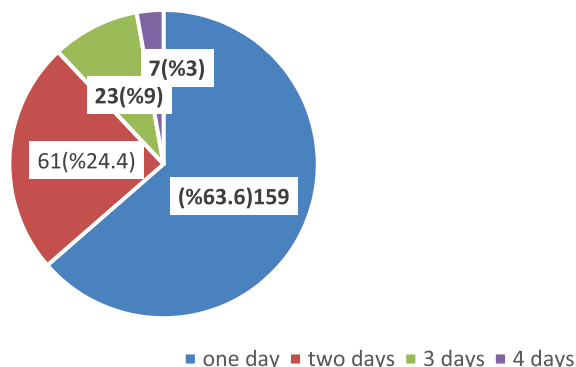
In this study, 60% of patient had right-sided hernia, fewer had left-side hernia, while bilateral hernia was the least common. Other studies have also reported similar results [5,10,11,14]. The right side is believed to be predominantly affected due to the delayed descent of the right testis and subsequent failure of closure of processus vaginalis [10,15–17].

In the present study, we reported that 53% of the patient were smokers, and all patients with recurrent inguinal hernia were found to be smokers. Smoking increases the risk of recurrence as described by most authors; however, smoking has not been shown to have a causative role in primary inguinal hernia [18–20].

In this study we equally observed that 92.8% of patients underwent elective hernia repair, while 7.2% of patient underwent emergency surgery for complicated inguinal hernia. Other studies have also reported similar results [6,11].

Lichtenstein tension-free repair was the procedure of choice for all patients with elective, non-complicated inguinal hernia and modified Bassini's repair was done for these patients with emergency presentation. Fifty percent of patients who underwent emergency hernia repair had irreducible hernia containing bowel and omentum. These cases were managed via open reduction of the contents and the modified Bassini's repair technique. Those with obstructed (33.33%) and strangulated (6%) hernias were also managed via open surgery and resection with end-to-end anastomosis of the unhealthy bowel segments as well as via modified Bassini's repair without mesh; this is also consistent with the findings of other studies [21].

In this study, we found that patients having a normal body mass index and those who were underweight constitute 62% of the total number of patients, whereas the incidence of hernia tended to decrease with increasing body mass index. Other studies reported similar results [22]. There seems to be a trend toward a higher risk of complications and a prolong hospital stay in the obese patients following inguinal hernia repair, with no significant difference in the types of hernia and in recurrence rates; other

**Figure 2.** The length of hospital stay.

studies also reported that obesity increase the rate of obstruction of lateral hernia [23].

In our study, postoperative complications were observed in 12% of patient, and seroma was the most common complication. Wound infection and ileus were also observed, especially in cases of strangulation and where bowel resection was performed. A similar trend was observed in other studies [21]. We observed that patients with primary hernia developed postoperative complications more than patients with recurrent hernia and this may be due to the larger number of patients with primary hernia.

In this study, we reported that most patients were hospitalized for 1 day postoperatively, particularly those who underwent elective hernia repair. Other patient, especially those who developed postoperative complications such as postoperative ileus following bowel resection and anastomosis in whom an intra-abdominal drain that remained in situ until discharged had been inserted as well as those with comorbidities were hospitalized for 4 days.

## 5. Conclusion

Inguinal hernia is the most common type of hernia in both men and women but occurs more commonly in men. Inguinal hernia repair remains a common surgical procedure in Al-Basra Teaching Hospital particularly among patients in their fourth decade of life and above.

Modified Bassini herniorrhaphy and Lichtenstein tension-free repair were the method of choice in majority of cases. Most patients underwent elective hernia repair did not require prolonged hospitalization. The majority of patients underwent elective hernia repair had minimal postoperative complications.

Most patients underwent emergency hernia repair had postoperative complications and they required prolonged hospitalization. It advocated that early presentation and elective hernia repair be encouraged to minimize postoperative complications and decrease the length of hospital stay All patients with recurrent hernia found to be smokers. Further studies in multiple centers with larger sample sizes are recommended in the future.

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## Disclosure statement

The author declares no conflict of interest.

## Notes on contributor

Dr. *Ahmed Ziarra Khalaf* was born in Basrah, Iraq and is graduate of Basrah University. He obtained his medical degree at Basrah University in Basrah. His residency was at Basrah and affiliated Al-Basrah Teaching Hospital , and he completed his training with fellowships at the University of Basrah in General and Laparoscopic surgery. Dr. khalaf has 10 years experience in general and laparoscopic surgery, with special interest in abdominal wall hernias procedures, laparoscopic GI procedures, endocrine procedures, bariatric procedures and breast surgery. He is founding member of the Bariatric center of Basrah Teaching Hospital and he is the chief of Basrah Teaching Hospital Breast center .Dr. Khalaf is a member of the Iraqi Board Of Medical Specialization, Board certified, member of the Teaching Staff of University of Basrah and a member of the Iraqi Union of Surgeons. Dr Khalaf resides in Basrah, Iraq with his wife and enjoy life with his four sons.

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