

Review Article Predictive Risk Factors for Development of Recurrent Inguinal Hernia in Children

Mohamad Theyab Hamad^{1*}, Mohammed Atyah Farhan², Hussein Alwan Khalaf³

¹Bilad Al Rafidain University, College of Medical and Health Technology/Department of Anaesthesia, Iraq. _e-mail: <u>dr.mohammedthyab@bauc14.edu.iq</u>

²Bilad Al Rafidain University, College of Medical and Health Technology/Department of Anaesthesia, Iraq e-mail: <u>af.mohammed63@gmail.com</u>

³Bilad Al Rafidain University, College of Medical and Health Technology/Department of Anaesthesia e-mail: <u>dr.hussainalobaidy@gmail.com</u>

* Corresponding Author: Mohamad Theyab Hamad

Abstract: Background: Hernia is a common surgical problem in children. Usually it requires surgical intervention and one complication of hernial surgery is recurrence of the hernia. Aim of study: To identify the predictive risk factors for recurrence of the hernia and make efforts to avoid the recurrence. Patient and methods: This is a prospective study conducted in Baquba teaching hospital for the period from the 1st of Jan. 2020 to the thirty of June 2024, included (188) cases. Open Herniotomy done for all of them. 163 patients (86.7%) were male and 25 patients (13.2%) female. 104 (55.3%) cases in right side and 82 case (43.6%) in left side and only (2) patients (1.06%) have bilateral inguinal hernia. Result: The age of the patient range from one month up to (14) years. Mean age was (3.12) years. Follow up period for one year for all patients to detect the recurrence. 7 patients (3.7%) develop recurrent hernia. 3 patients less than one year, 3 patients from 6-10 years and one patient is more than 11 years. 18 (9.57%) have thin sac and 3 (16.6%)of them develop hernia while those with normal wall thickness only one patient (0.58%) develop hernia. 15 patients (7.79%) have wide neck sac more than 1.5cm 2 (13.3%)of them develop hernia and only one patient (0.57%) with narrow sac neck less than 1.5cm are more predictive risk factors for developing recurrent inguinal hernia in children.

Keywords: Children; Inguinal Hernia; Recurrence; Risk Factors

1. Introduction

The most common surgical intervention in childhood is for inguinal hernia ^(1,2). The rate of occurrence of inguinal hernia is about [3.5-5%] in full term neonate ⁽³⁾. More in male than female and usually congenital in origin but can be acquired ⁽⁴⁾. They found that the recurrence in inguinal hernia operations are reported to be [0.68-4%] in deferent studies ⁽⁵⁻⁸⁾. Although the laparoscope is now increasingly used but open surgery remains the most commonly used approach. Inguinal hernia in children occur in about 2% more in boys and can be unilateral or bilateral and more in right side.

It is of 2 types either indirect or direct. The indirect one is more than 90% and it is congenital as small opening in groin and allows fluids or momentum or bowel to pass down and can reach the scrotum causing inguinal swelling. Mostly presented as a cold case but can be presented as urgent one due to strangulation.

The direct type is about 10% due to recurrent straining during lifting heavy things. The surgical interference is done whenever we discovered. Recurrence is more in right side than left. Many causes can lead to recurrence of inguinal hernia like;

- Tear in wall of the sac, slipped ligature, loose knot, missing part of peritoneum and wide neck.
- In adequate high ligation of the sac.

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- Wound infection.
- Haematoma.
- Injury to the floor of inguinal canal during operation.
- Malnutrition and growth failure.
- Increase intra-abdominal pressure.
- None closure of the internal ring in girls (7).

Most of recurrence is due to tearing of friable sac wall, slipped ligature and loose knot.

Recurrence of inguinal hernia in children occurs early because of immaturity of the connective tissue and difficulties in anatomical, functional and structure of the inguinal canal ⁽⁸⁾. These factors determine the technical difficulties in performing the surgical intervention and needs good knowledge from the surgeon about the anatomy of the inguinal region in children and good practical training and they found that the rate of the recurrence is higher in laparoscopic than open surgery ⁽⁹⁻¹⁰⁾.

2. Material and Methods

This is a prospective cross sectional study performed in Baquba teaching hospital for the period from 1st. of Jan. 2020 to 30th June 2024. a data collected for (188) patients of paediatric age group who had operated on for inguinal hernia and the data includes age, gender and the causes of recurrence, the results of this descriptive study presented by number and percentage. All patients followed for one year for detection of recurrence.

3. Result

The study shows the distribution according to age, the commonest age group is [1-5] years, 81 case (43%) then the age of less than (1) year 61 case (32%) then [6-10] years 33 case (18%) and the last age group is [11-14] years 13 case (7%) as shown in table (1).

Table (2) shows the gender distribution of the cases [163] male (87%) and [25] case (13%) female.

Table (3) shows that the operation done on right side for 104 cases (55%) and on left side 82 case (44%) and 2 cases (1%) were bilateral.

The distribution of recurrent cases according to age group shown in table (4).

Three cases occur for less than 1 year, 3 cases for age group [6-10] years and 1 case for more than 11 years.

The table (5) shows the distribution of recurrent cases according the causes. The No. of cases (7) and the most common cause is thin sac wall were found in 3 patients (16.6%) next common cause is wide sac neck more than 1.5cm 2 patient (13.3%) and 1 case has normal sac wall (0.58%) and the last 1 case (0.58%) has narrow sac neck.

Age group	No.	0%	
Less than one year	61	32	
1-5 years	81	43	
6- 10 years	33	18	
11 – 14 years	13	7	
Total	188	100	

Table 1. shows the distribution of the patients according to age.

Table 2. distribution of the patients according to gender.

Gender	No.	%
Male	163	87
Female	25	13
Total	188	100

Site of the hernia	No.	%
Right side	104	55
Left side	82	44
Bilateral	2	1
Total	188	100

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Age group	No.	%
Less than one year	3	1.59
1-10 years	3	1.59
More than 11 years	1	0.53
Total	7	3.71

Table	5.	distributi	on of	hernia	recurrence	according	the causes.
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Causes	No.	%
Normal wall thickness sac	1	0.58
Thin sac wall 18 case (9.57).	3	16.6
Wide neck sac 15 case (7.97).	2	13.3
Normal neck sac		
	1	0.58

4. Discussion

The total number of the patient included in this study is 188 patients. their ages ranging from one month up to 14 years all operated on in Baquaba teaching hospital and other private hospital. The commonest age group underwent operation is (1-5) years 81 patients 43% and the next common age group is below one year 61 patients 32%. The journal of paediatric surgery volume 26 1991⁽¹¹⁾ mention that the most age group underwent hernia operation is below 6 months. Other study journal of paediatric surgery volume 53, 2018 ⁽⁷⁾ mention that the most common age group underwent operation is below one year 37% then the age group (5-12) years 24%. Danish medical journal 2020⁽¹⁶⁾ mention that 79% of the patients are below 2 years and 21% for the age group (2-12) years.

In this study the number of male patients who had operated on for inguinal hernia is (163) 87% and the female patients are (25) 13%. An article published in February volume 40, 2024⁽¹⁷⁾ mentioned that the per-cent of male who exposed to inguinal hernia operation is 84.6% and the female is 15.4%. Open journal of surgery 2020⁽¹⁴⁾ said that the per-cent of male underwent surgery for inguinal hernia is 85.1% and the female is 14.9%.

American journal of surgery 2024⁽¹⁵⁾ mentions that 83.5% were male and 16.5% were female who underwent surgery for inguinal hernia.

We found that the right side is the commonest side have hernia (104) case 55% and the left side is (82) case 44%. Also the journal of paediatric surgery volume 26 1991⁽¹¹⁾ mention that the right side is the commonest side 74% and the left side is 24%.

In this study we have only (7) patients 3.7% with recurrent inguinal hernia operations. Other study like Bonnard A. $2003^{(12)}$ mention that the rate of recurrence is (0.5-1%) while stienau G 1995⁽¹³⁾ mention that the rate of recurrence is (0.5-3.8%).

According to the causes we found that (18) patients have thin wall sac and (3) patients 1.6% of them develop recurrent inguinal hernia and (15) cases have wide neck sac and only (2) patients 1.06% develop recurrence of the hernia. Open journal of surgery volume 3, 2020⁽¹⁴⁾ mention that 40.4% from total number of patient who develop recurrence are due to wide neck and 57.4% have patent processus vaginalis means the inguinal canal not closed due to slipped ligature.

Conclusions

The most common causes of recurrent inguinal hernia in children in Baquba teaching hospital is thin wall sac and then the wide neck sac.

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