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Retrospective Analysis of Inguinal Hernia in Pediatric Patients in a Tertiary Center, Misurata– Libya

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Abstract

Background: Inguinal hernia repair is one of the most commonly performed operations and it is among the most frequent reasons for referral to pediatric surgery clinics. The incidence of inguinal hernia is 1-5% in the pediatric population and is even higher in premature babies, as high as 10-30%.

Aim of the study: to analyze inguinal hernia distribution according to age, gender, side and associated congenital anomalies in the pediatric population.

Materials and Methods: A descriptive retrospective study included all pediatric patients diagnosed as inguinal hernia and operated at pediatric surgery department in Misurata Medical Center during the year of 2022. Hospital records were reviewed, and patients' data were collected in terms of age, sex, site of hernia, presence of incarceration and congenital abnormality association.

Results: 103 patients included in the study, 77 (74.8%) patients were males and 26 (25.2%) were females, with a female to male ratio 1:2.96. Age of patients ranged from 1 month to 14 years, with mean age of 2.9 years. Right side was affected in 51 patients (49.5%), while left side was 37 patients (35.9%), bilateral inguinal hernia was found in 15 patients (14.6%). Elective cases were 99 patients (96.1%), while urgent cases were 4 patients (3.9%) with diagnosis of incarcerated or strangulated hernia. 98 (95.1%) cases did not have any association, while associated conditions were undescended testis, hydrocele and umbilical hernia.

Conclusion: Inguinal hernia is a common condition among pediatric age group, three times more common in males than females, more common in right side, 4% of cases present as urgent cases with incarceration indicating urgent intervention.

I) Introduction

The surgical correction of inguinal hernias ranks as one of the most frequently conducted procedures, frequently prompting referrals to pediatric surgery clinics. In the pediatric population, the prevalence of inguinal hernias ranges from 1% to 5%, with premature infants experiencing an even higher incidence, reaching up to 10-30%.(1)

In 1804, Astley Cooper provided a definition for hernia as "a protrusion of any viscus from its proper cavity," where the protruded components are typically enclosed in a sac-like structure formed by the membrane lining the natural cavity. The term "hernia" originates from the Latin word for "rupture." In describing abdominal hernias, Hippocrates utilized the Greek term "Hernios," which signifies a bud or bulge.(2)

Inguinal hernias were documented prior to 1550 BC, but the advent of modern surgery occurred in the late nineteenth century, marked by a more precise comprehension of anatomy. In children, 99% of indirect inguinal hernias stem from a persistent processus vaginalis. Nonetheless, direct inguinal and femoral hernias are infrequent, accounting for approximately 0.5-1% of cases. (1)

Hernias may be congenital or acquired, complete or partial, external or internal, reducible or irreducible, direct or indirect. Past research suggests a higher prevalence of external hernias compared to internal hernias. Among hernias, abdominal hernias are the most prevalent. Within abdominal hernias, inguinal hernias are more common, with the indirect variety being more frequent among them. (2)

Hernias can manifest in various ways, spanning from urgent situations like strangulated hernias to less urgent, reducible hernias. It is crucial to identify the indications of a hernia containing compromised contents to avert severe complications, including intestinal perforation, testicular atrophy, and ovarian damage. Occasionally, conditions like hydrocele and undescended testis are mistakenly associated with an inguinal hernia. Recognizing these distinctions is essential for accurate diagnosis and appropriate management.(3)

A significant complication of inguinal hernia (IH) is the occurrence of incarcerated hernia. In children with IH, the likelihood of incarceration varies between 3% and 16%, reaching its highest estimated incidence of 30% in premature infants.(4)

In this study, we reviewed all children with inguinal hernia who was operated in Misrata Medical Center during the year 2022 to document clinical features of inguinal hernia (IH) and evaluate its pattern and associating conditions in the pediatric population.

II) Materials and Methods

A descriptive retrospective study included all pediatric patients diagnosed as inguinal hernia and operated at pediatric surgery department in Misurata Medical Center during the period from January 1st 2022 to December 31st 2022. Hospital records were reviewed and patients' data were collected in terms of age, sex, site of hernia, presence of incarceration and congenital abnormality association. All cases underwent herniotomy and discharged at the same day. Diagnosis of hernia was based on clinical examination and ultrasonography.

III) Results:

Total patients included in the study were 103 patients, 77 (74.8%) patients were males and 26 (25.2%) were females, with a female to male ratio 1:2.96. (figure 1)

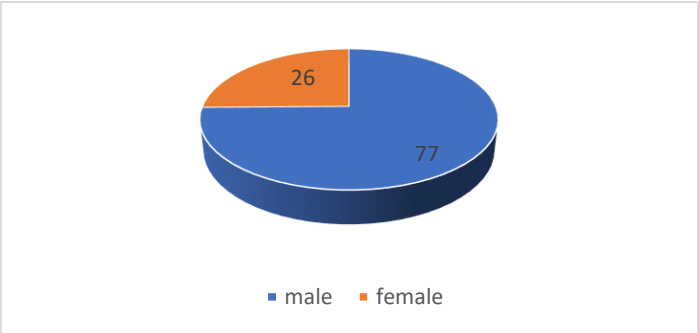

Figure 1. gender distribution of patients

Age of patients ranged from 1 month to 14 years, with mean age of 2.9 years. Patients distribution according to age groups is detailed in Table 1 and presented in figure 2.

Table 1. Patients distribution according to age groups

	Frequency	Percent %
Less than 1 year	42	40.8
1-5 years	41	39.8
6-10 years	16	15.5
More than 10 years	4	3.9
Total	103	100.0

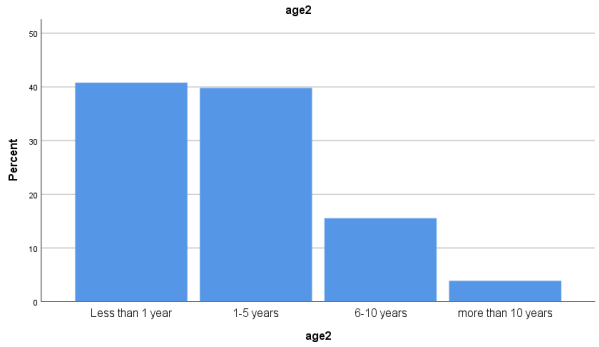

Figure 2. Patients distribution according to age groups

Number of patients with right side inguinal hernia was 51 patients (49.5%), while number of patients with left side inguinal hernia was 37 patients (35.9%), bilateral inguinal hernia was found in 15 patients (14.6%). Figure 3.

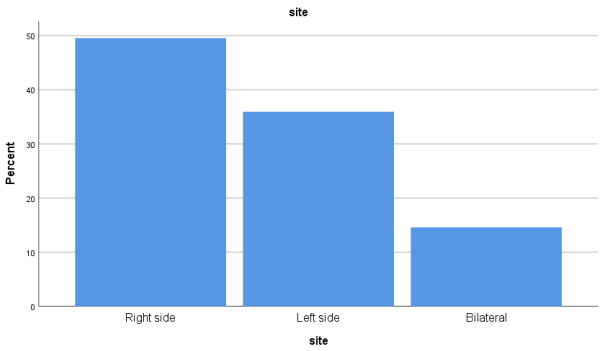

Figure 3. patient distribution according to side of inguinal hernia.

The number of cases which were operated as elective cases was 99 patients (96.1%), while there were 4 patients (3.9%) operated urgently as they were diagnosed as incarcerated or strangulated hernia. Figure 4.

Out of the four patients with incarcerated hernia, 3 (75%) were males and one patient (25%) was female. The age distribution of patients with incarcerated hernia is shown in table 2.

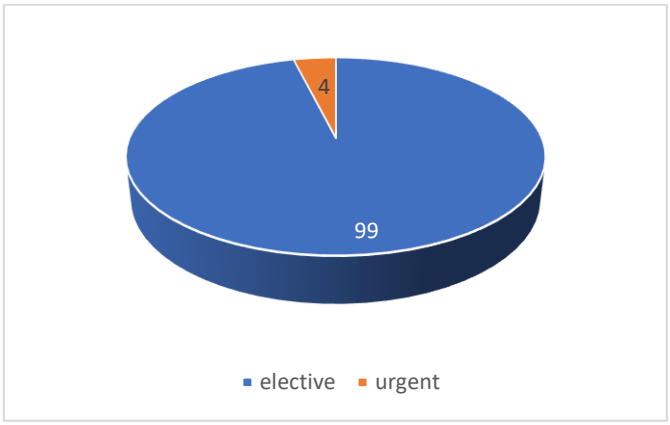

Figure 4. Classification of cases according to urgency

Table 2. Age distribution of patients with incarcerated hernia operated urgently

Age group	No. cases with incarcerated hernia	percentage
Less than 1 year	1	25%
1-5 years	2	50%
6-10 years	1	25%
more than 10 years	0	0%
Total	4	100%

Number of cases who did not have any association was 98 (95.1%), while associated conditions are shown in table 2.

Table 2. Conditions associated with inguinal hernia.

	Frequency	Percent %
no association	98	95.1
undescended testis	2	1.9
hydrocele	1	1.0
umbilical hernia	2	1.9
Total	103	100.0

IV) Discussion:

Inguinal hernia repair is one of the most commonly performed operations and it is among the most frequent reasons for referral to pediatric surgery clinics. The incidence of inguinal hernia is 1-5% in the pediatric population and is even higher in premature babies, as high as 10-30%. (1) Early diagnosis and early intervention of inguinal hernias among infants decrease the risk of complication and urgent intervention. Delay in intervention associated with more morbidity and mortality. Infantile inguinal hernia affected more males than females in ratio of 3: 1, which is a higher in females proportion than reported in other studies and other countries where average ratio is 4-8 : 1. (5)

In infants accounted for about 40.8% (n=42). In 95% of cases without hydrocele or undescended testis, and in 2% associated with inguinal testis.

In a systemic review conducted in 2019, Christoffer et al. reported that the percentage of incarceration of pediatric inguinal hernia is 7% for all children and 11% for preterm children (6), while in our study the percentage of patients with incarceration who required emergency surgery was 4% of cases which less than other studies in literature. This is may be explained by that we routinely try first to do reduction under sedation to release the obstruction then we plan for elective surgery. In our study, Incarceration of inguinal hernia is more common in males than females of the four patients with incarcerated hernia, 3 patients (75%) were males and one patient (25%) was female, which is consistent with most of the studies in literature (7). About one fourth of patients with incarcerated hernia were younger than one year of age, and with increase of age and activity, the risk and the percentage of incarceration increase.

The age range at presentation varied from 1 month to 14 years, with a mean age of 2,9 years, which is lower than the mean ages reported in other studies (8,9). This is can be explained by the early presentation of patients to tertiary health centers in our healthcare system, in contrast to other countries where presentation to surgery specialists may be delayed due to long waiting lists and complicated referral system.

In our study is like in most other studies, we found that right side inguinal hernia was slightly more common than left side inguinal hernia 51 patients (49.5%), while number of patients with left side inguinal hernia was 37 patients (35.9%), right to left ratio of 1: 0,7 and bilateral inguinal hernia in 14,6%, these findings were consistent with the literature. (10)

Our study revealed that associated anomalies, such as umbilical hernia, undescended testis, and congenital hydrocele, occur at low rates (typically under 5% of patients). These anomalies are generally not relevant to the surgical management or associated complications. For instance, umbilical hernias are often asymptomatic and resolve spontaneously in many children, whereas hydroceles frequently do not require intervention unless persistent. When an undescended testis or hydrocele is present on the same side as an inguinal hernia, both conditions are typically addressed in a single surgical session. This does not alter the standard approach to performing the inguinal herniotomy. Inguinal hernias, however, necessitate timely surgical repair due to a higher risk of complications, particularly incarceration, compared to associated conditions. Understanding the prevalence and implications of these anomalies helps optimize surgical prioritization and parental counseling in clinical practice (11,12).

V) Conclusion:

Inguinal hernia is a common condition among pediatric age group, three times more common in males than females, more common in right side, 4% of cases present as urgent cases with incarceration indicating urgent intervention.Inguinal hernia associated in 5% with hydrocele and with undescended testis specially in preterm patients.

VI) References

1.Tigabie W, Kiflu W, Temesgen F, Getachew H, Nigussie T, Dejenie B. Retrospective Analysis of Inguinal Hernia in Pediatric Patients in a Tertiary Center, Addis Ababa, Ethiopia. Open Access Surgery. 07 Dec 2022;15(2022):9-15.

2 .Fatima A, Mohiuddin MR. Study of incidence of inguinal hernias and the risk factors associated with the inguinal hernias in the regional population of a South Indian City. International Journal of Current Research and Review. December 2014;6(23):9.

3 .Yeap E, Pacilli M, Nataraja RM. Inguinal hernias in children. Aust J Gen Pract. 2020 Jan-Feb;49(1-2):38-43 .

4. Ksia A, Braiki M, Ouaghnan W, Sfar S, Ammar S, Ben Youssef S, Boussaffara B, Sahnoun L, Mekki M, Belghith M, Nouri A. Male gender and prematurity are risk factors for incarceration in pediatric inguinal hernia: a study of 922 children. Journal of Indian Association of Pediatric Surgeons. 2017 Jul-Sep; 22(3): 139–143.

5. Ibrahim, Saleh., Muaz, Ahmed. Pattern and prevalence of hernia in child at Bahri Teaching Hospital 2013 – 2015. (2016).;4(7):2523-2526. doi: 10.21276/SJAMS.2016.4.7.45

6. Christoffer, Skov, Olesen., Laura, Quitzau, Mortensen., Stina, Öberg., Jörg, Rosenberg. Risk of incarceration in children with inguinal hernia: a systematic review.. Hernia, (2019). doi: 10.1007/S10029-019-01877-0

7. Najia, Owish, Alhojaili., Attia, alzahrani., Ibrahim, I., Kutbi., Helal, Almalki., Laila, Alabasi., Amal, Ali, Zubani. Neonatal Incarceration of Inguinal Hernia with Torsion of Right Testes. Journal of Medical Research and Surgery, (2023). doi: 10.52916/jmrs234112

8. L., D., Agrawal., Rahul, Gupta., Shyam, B., Sharma. Inguinal herniotomy in children: retrospective three decades experience. Medical journal of Dr. D.Y. Patil Vidyapeeth, (2023). doi: 10.4103/mjdrdypu.mjdrdypu_159_21

9. Rajesh, Kumar., Vijay, Shankar, Prasad. A study of inguinal hernia in children. International Surgery Journal, (2018). doi: 10.18203/2349-2902.ISJ20182773

10. Marjan, Joudi., Mehdi, Fathi., Mohammad, Mehdi, zarif, soltani., Hormoz, Hosseinpoor., Mohammad, Aref, Emami., Ali, Azadmand. A Survey of Pediatric Inguinal Hernia: A Single Center Experience with 40,000 Cases in a Ten-Year Period (2009-2019). International Journal of Pediatrics, (2021). doi: 10.22038/IJP.2020.52439.4165

11. Davenport M. ABC of General Paediatric Surgery: INGUINAL HERNIA, HYDROCELE, AND THE UNDESCENDED TESTIS. BMJ. 1996 Mar 2;312(7030):564–7 .

12 . Bowling K, Hart N, Cox P, Srinivas G. Management of paediatric hernia. BMJ. 2017 Oct 19;359:j4484 .