



# Inguinal Hernia in Female Children: A Single Surgeon's Experience

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## Abstract

**Background:** Inguinal hernia is a common surgical condition in children. In females, there is a risk of injury to the ovary or fallopian tube during the surgical repair. The aim of this study was to evaluate a single surgeon's experience in the management of female children who presented with inguinal hernia.

**Materials and Methods:** This was a retrospective study of female children aged 15 years and younger who had inguinal hernia repair over a 5 year period. The age, presenting symptoms, side of the hernia, interval between symptom and presentation, interval between presentation and surgery, operative procedure performed, intra-operative finding/content of the hernia sac, post-operative complications, and duration of hospital stay and outcome of treatment were assessed.

**Results:** A total of 1,142 cases of inguinal hernia repairs were undertaken during the study period. Out this number, 227 inguinal hernia repairs were performed in females. Infants were mostly affected and repair of the inguinal hernia was performed as day cases. All the patients presented with swelling in the inguinal region and right sided inguinal hernia predominated. At surgery, about one quarter of the hernia sac contains the ovary or fallopian tube and surgical site infection was the most common post-operative complication. There was no mortality.

**Conclusion:** Inguinal hernias in females may not be as common as inguinal hernias in males, but there is a significant risk of damage to the reproductive organs (fallopian tube or ovary) during surgery for the repair of the hernia.

**Keywords:** Children; Experience; Female; Inguinal hernia

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## Introduction

In pediatric surgery practice, inguinal hernias are frequently encountered. These inguinal hernias are congenital and are usually asymptomatic [1]. The incidence of inguinal hernia has been quoted as 3.5% to 5% and 44% to 55% in full term and preterm babies respectively [2,3]. Inguinal hernias form a majority of the surgical condition in children that require surgical treatment and are the most often performed surgical operation in the pediatric age group. Etiologically, inguinal hernias in children result from patent processus vaginalis [4]. Inguinal hernia is a common clinical condition in children. Although the incidence of unilateral inguinal hernia is higher in males, the incidence of bilateral hernia is more in females [5]. In female children, the challenges in managing inguinal hernia include inability of the surgeon to confirm the inguinal hernia which the parent/caregiver describes as a swelling in the inguinal region. The possible presence of ovary or fallopian tubes is an important consideration before and during inguinal hernia repair in children especially in cases of sliding hernias [6]. Preoperatively, the chances of incarcerated inguinal hernia are more in female sex. The risk of injury to the ovary and fallopian tube during herniotomy in female children is quite high [7]. The current trend is to operate on inguinal hernias on a day care basis [5]. Emphasis on the presence of fallopian tubes and ovaries in female inguinal hernia is rarely made and there is paucity of data on the prevalence of female inguinal hernia in children in southeastern part of Nigeria. The aim of this study was to evaluate a single surgeon's experience in the management of female children who presented with inguinal hernia.

## Materials and Methods

This was a retrospective study of female children aged 15 years and younger who had inguinal hernia repair between January 2009 and December 2018 at the pediatric surgery unit of Enugu State University Teaching Hospital (ESUTH) Enugu, Nigeria. ESUTH is a tertiary hospital located

in Enugu, South East Nigeria. The hospital serves the whole of Enugu State, which according to the 2016 estimates of the National Population Commission and Nigerian National Bureau of Statistics, has a population of about 4 million people and a population density of 616.0/km<sup>2</sup>. The hospital also receives referrals from its neighboring states. Patients who have had inguinal hernia repair at a peripheral hospital before referral to ESUTH for reoperation were excluded from this study. Patients with incomplete medical records were also excluded from the study. Information was extracted from the medical records, operation notes, operation register, and admission-discharge records. The information extracted included age, presenting symptoms, side of the hernia, interval between symptom and presentation, interval between presentation and surgery, operative procedure performed, and intra-operative finding/content of the hernia sac, post-operative complications, and duration of hospital stay and outcome of treatment.

### Preoperative protocol

Female children who presented with inguinal hernia were clinically evaluated and appropriate investigations such as hemoglobin estimation and genotype performed. Informed consent was obtained from the patient's parents/caregivers and patient booked for surgery.

### Intra-operative protocol

Under general anesthesia, surgical access was through an inguinal incision which is deepened to the scarpa's fascia. The hernia sac was mobilized and the sac opened for assessment of the content of the hernia. High ligation of the hernia sac was done and the surgical wound closed in layers.

### Post-operative protocol

The patients were treated as day cases. They were placed on analgesic and antibiotics. The wound was reviewed on sixth day post-op and was subsequently left exposed. Any post-operative complications were noted.

## Results

### Patients' demographics

A total of 1,142 cases of inguinal hernia repairs were undertaken during the study period. Out this number, 227 inguinal hernia repairs were performed in females and form the basis of this report. Female inguinal hernia accounted for about 20% of all the inguinal hernias treated during the period. Details of the patients' demographics are shown in Table 1.

### Presenting symptoms

All the patients presented with inguinal swelling. There was an associated intermittent pain in the inguinal region in 112 (49.3%) patients. Twenty-four (10.6%) patients presented with features of incarcerated inguinal hernia.

### Side of the hernia

One hundred and thirty-seven (60.4%) hernias were right sided whereas 69 (30.4%) had left inguinal sided. Twenty-one (9.2%) had bilateral inguinal hernia.

### Content of the hernia sac

This is shown in Table 2.

### Operative finding and procedure performed

All the patients had herniotomy. Ten (4.4%) patients had omentum of questionable viability and required excision of the

**Table 1:** Patients' demographics (n=227).

Parameters	Value
Age group	
Neonate (less than one month)	15 (6.6%)
Older than one month, less than 12 months	160 (70.5%)
Older than 12 months	52 (22.9%)
Median age of the patients	2 years (3 weeks to 10 years)
Mean interval between symptom and presentation	6 months (3 to 22 months)
Interval between presentation and surgery	2 months (1 week to 4 months)
The mean duration of hospital stay	1.3 days (1-3)

**Table 2:** Content of the hernia sac.

Content of the hernia sac	Number of patients	Percentage
No content	110	48.5
Omentum	50	22
Ovary	37	16.3
Bowel	17	7.5
Fallopian tube	13	5.7

involved part. Three (1.3%) patients had non-viable bowel and required intestinal resection and anastomosis. None of the ovaries or fallopian tubes was resected because they were all found to be viable.

### Post-operative complications

Surgical site infection occurred in 24 (10.6%) patients, 15 (6.6%) patients had suture related complications and 11 (4.8%) patients had recurrence of the inguinal hernia.

### Treatment outcome

All the patients achieved full recovery and were discharge home. There was no mortality.

## Discussion

Inguinal hernias commonly occur during infancy and are one of the most common surgical conditions in childhood [8]. Inguinal hernias are approximately six times less common in females than males [9]. It is interesting to note that 1 male in 5 and 1 female in 50 will eventually develop inguinal hernia in lifetime [10]. The sac of the inguinal hernia is formed by the unobliterated portion of the peritoneal invagination of the canal of Nuck that runs along and partly covers the round ligation [10]. Surgical treatment of inguinal hernias in females may cause damage to the ovary or fallopian tube [8]. This damage may cause fertility problems in the future.

In the present study, inguinal hernias in females accounted for about 20% of the total inguinal hernia seen during the study period. This is comparable to the report of other authors [10,11]. However, there are variations as reported by other authors [5,12]. Majority of the patients in the index study were infants. Goldstein et al. also reported the high incidence of inguinal hernia in female infants [13]. It is worthy to note that the risk of inguinal hernia incarceration is higher in infants [14]. The median age of the patients with inguinal hernia, at presentation, may depend on the age at which the inguinal hernia was noticed by the parents. The mean interval of 6 months existed between when the symptom was first noticed and the time of presentation to the hospital. Poverty, ignorance and level of awareness of the parents may have affected the time of presentation. The large patient load seen in the teaching hospital may be responsible for the 2

months lag period between presentation and treatment. The patients were operated upon on day case basis. However, in cases of delayed recovery from anesthesia and associated co-morbidities, patients were admitted for close observation in the hospital.

In the current study, all the patients presented with inguinal swelling. Helal et al. [15] in their series also documented that females with inguinal hernia presented with intermittent swelling or bulge in the inguinal region. However, when there is ovary or fallopian tube in the hernia sac, pain and tenderness over the inguinal swelling may be present [5]. In cases of incarcerated hernia, there is pain of intense severity. Severe inguinal pain with no incarceration seldom exists [16]. There was predominance of right sided hernia in our patients. Similarly, Dreuning et al. [17] also reported predominance of right inguinal hernia with bilateral inguinal hernia seen in one-tenth of the patients.

At surgery, about half of the patients had no visceral content in the hernia sac. The effect of anesthesia (muscle relaxant) and supine position may have resulted in the reduction of the content of the hernia. Spangen et al. [18] published a series on non-palpable inguinal hernia in females that is associated with inguinal and lower abdominal pain in cases of visceral involvement. Reproductive organs (ovary and fallopian tube) are contents of the hernia sac in female inguinal hernia in 15% to 35% of the patients [17].

Definitive operative procedures performed in the patients depended on the findings at surgery. Non-viable tissues found at surgery were resected and herniorrhaphy performed. Several studies have reported the importance of opening the hernia sac and inspecting the content. This is very pertinent to avoid damage to the ovary or fallopian tube [6,10,17].

Surgical site infection was the most common post-operative complication in the current series. Cai et al. [19] reviewed the impact of surgical site infection after inguinal hernia repairs and emphasized the need to monitor surgical outcome and ensure that care is provided safely.

## Conclusion

Inguinal hernias in females may not be as common as inguinal hernias in males, but there is a significant risk to the reproductive organs during surgery for the repair of the hernia in females. Repair of female inguinal hernia in children should be undertaken by pediatric surgeons who are skilled in such procedures.

## References

- Grey SW, Skandalakis JE. Embryology for surgeons. Philadelphia: WB Saunders; 1972. p. 417-422.
- Groff DB, Nagaraj HS, Pietsch JB. Inguinal hernia in premature infants who were operated on before discharge from the neonatal intensive care unit. Arch Surg. 1985;120(8):962-3.
- Grosfeld JL, Minnick K, Shedd F, West KW, Rescorla FJ, Vane DW. Inguinal hernia in children: Factors affecting recurrence in 62 cases. J Pediatr Surg. 1991;26(3):283-7.
- Handa R, Kale R, Harjai M. Incidental inguinal hernias on laparoscopy. Asian J Surg. 2006;29(1):28-30.
- Ravikumar VSR, Kumar HR, Gowda MRN. A clinical study on the management of inguinal hernias in children on the general surgical practice. J Clin Diag Res. 2013;7(1):144-7.
- Osifo OD, Ovueni ME. Inguinal hernia in Nigerian female children: Beware of ovary and fallopian tube as contents. Hernia. 2009;13(2):149-53.
- Zamakhshary M, To T, Guan J, Langer JC. Risk of incarceration of inguinal hernia among infants and young children awaiting elective surgery. CMAJ. 2008;179(10):1001-5.
- Cam C, Celik C, Sancak A, Iskender C, Karateke A. Inguinal herniorrhaphy in childhood may result in tubal damage and future infertility. Arch Gynecol Obstet. 2009;279(2):175-6.
- Read RC, White HJ. Inguinal herniation 1777-1977. Am J Surg. 1978;136(6):651-4.
- Chawla S. Inguinal hernia in females. Med J Armed Forces India. 2001;57(4):306-8.
- Aihole JS. The demographic profile and the management of infantile inguinal hernia: A 3-year's review. Afr J Urol. 2020;26:28.
- Chen YH, Wei CH, Wang KK. Children With inguinal hernia repairs: Age and gender characteristics. Glob Pediatr Health. 2018;5:2333794X18816909.
- Goldstein IR, Potts WJ. Inguinal hernia in female infants and children. Ann Surg. 1958;148(5):819-22.
- Bamigbola KT, Nasir AA, Abdur-Rahman LO, Adeniran JO. Complicated childhood inguinal hernias in UITH, Ilorin. Afr J Paediatr Surg. 2012;9(3):227-30.
- Helal AA. Inguinal hernia in infancy and children. Hernia. 2017.
- Mitura K, Smietanski M, Koziel S, Garnysz K, Michalek I. Factors influencing inguinal hernia symptoms and preoperative evaluation of symptoms by patients: Results of a prospective study including 1647 patients. Hernia. 2018;22(4):585-91.
- Dreuning KM, Barendsen RW, van Trotsenburg AP, Twisk JW, Sleeboom C, van Heum LE, et al. Inguinal hernia in girls: A retrospective analysis of over 1000 patients. J Pediatr Surg. 2020;55(9):1908-13.
- Spangen L, Smedberg SG. Nonpalpable inguinal hernia in women. In: Bendavid R, Abrahamson J, Arregui ME, Flament JB, Phillips EH, editors. Abdominal Wall Hernias. Springer, New York, NY.
- Cai LZ, Foster D, Kethman WC, Weiser TG, Forrester JD. Surgical site infections after inguinal hernia repairs performed in low and middle human development index countries: A systemic review. Surg Infect (Larchmt). 2018;19(1):11-20.