



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**INGUINOSCROTAL SWELLINGS IN CHILDREN-  
?A MATTER OF CONCERN??**

**KEY WORDS:**

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**ABSTRACT**

• **AIM:**  
 1. To study the age, sex, aetiology and sidewise distribution of the inguinoscrotal swelling in children  
 2. To study the association with time of delivery and birth weight with incidence of inguinal swelling  
 3. To study association with congenital anomalies like undescended testis, hydrocele, hypospadias, intersex, patency of processus vaginalis.  
 4. To study the various complications like irreducibility, incarceration, obstruction and strangulation.  
 5. To study the post operative complication rate.  
 • **METHODOLOGY:**  
 This was a time bound prospective study of 50 cases diagnosed as inguinoscrotal presented to a tertiary care centre in a period of 2 years, done by direct interview with patient, patient informant and obtaining a detailed history. Thorough clinical examination and appropriate investigation of the patients were conducted then. A pretested structural proforma was used to collect relevant information for each individual patient selected.  
 • **RESULTS:**  
 50 children belonging to the age range of 1 month to 11 years were included in the study. Most had a unilateral swelling with a significantly higher number of hernia on the right side in males. 6% had an associated phimosis.  
 • **CONCLUSIONS:**  
 Inguinoscrotal swellings were more common in males, and there was higher incidence of phimosis among them. The swellings were predominately on the right side in males with a significant difference when compared to females. The age of presentation was 5.01 years and many of the patients presented to hospital after a considerable time of presence of swelling. Complications included surgical site infections and reoperations in a small number of children. We propose similar studies in future with a higher patient sample size, long term follow up for complications, reasons for late presentation for treatment and cost effectiveness of treatment modalities.

**INTRODUCTION**

Inguino-scrotal swellings are one of the commonest health problems in infancy and childhood throughout the world. The incidence of inguinal hernia has been reported to range between 0.8% and 4.4%, which roughly translates upto 10 to 20 per 1000 live births.<sup>[1]</sup> Among the inguino-scrotal swellings, inguinal hernia and hydrocele top the list in frequency. They represent the conditions most frequently requiring surgical repair in the paediatric age group.

As a result of improved neonatal intensive care, more and more premature babies are being delivered and consequently the incidence of neonatal inguinal hernia and hydrocele is increasing. The incidence of inguinal hernia in premature infants has been reported to be about 5-30%. Parents are usually the first person to notice the swelling or bulge in the inguinal region when changing a diaper or bathing or while the child is crying or straining.

Childhood inguinal hernias are more common on right side due to delay in descent of right testis. Regarding the sex prevalence, males are more commonly affected. But in the case of bilateral hernias, incidence is more in females.

As many hydroceles of the tunica vaginalis may involute spontaneously, hydroceles that do not change over time should be observed atleast upto 1 year of age before considering repair.

At birth, 4 out of every 100 males will have an undescended testis.<sup>[2]</sup> All undescended testis associated with symptomatic hernias should be repaired at the time of presentation, even in infants younger than one year. Delay in diagnosis avoids the complications of incarceration, strangulation and testicular infarction while maximizing future potential fertility.

In many of these cases, clinical examination may suffice to

obtain a definite diagnosis, but when the diagnosis is inconclusive, ultrasonography can play an important role.

Camper, Cooper, Hesselbach and Scarpa laid the foundations for Bassini and Halsted<sup>[3]</sup> to propose sound anatomical repairs for inguinal hernia. Ferguson<sup>[4]</sup> proposed hernia repair by just exposure, dissection, simple high ligation and removal of the hernia sac, which was applied successfully to the pediatric population by Potts et al.<sup>[5]</sup> Inguinal herniotomy in children is a safe and effective operation. In general, infants and children require general anesthesia for the operative repair of inguinal hernia and hydrocele. An absent vas deferens at the time of hernia operation should alert the surgeon of two possible conditions- cystic fibrosis and ipsilateral renal agenesis.

Post-operative complications are usually rare following elective operation whereas minor complications do occur after emergency operation. When operating urgently for a strangulated hernia in a child complications occur 20 times that of planned procedure. Recurrence is usually rare if operated by experienced surgeons.

**METHODOLOGY:**

**Study Design**  
 Time-bound prospective observational study

**MATERIALS AND METHODS**

- This was a time bound prospective study of all cases diagnosed as inguinoscrotal swelling.
- Period of study is from NOVEMBER 2018 to OCTOBER 2020
- Direct interview with patient, patient informant and obtaining a detailed history.
- Thorough clinical examination.
- Appropriate investigation of the patients.
- A pretested structural proforma was used to collect

- relevant information for each individual patient selected.
- Cases were selected consequently with inclusion and exclusion criteria mentioned below.

**INVESTIGATIONS**

**1. Routine investigations**

- Haemoglobin percentage
- Total count, Differential count
- Erythrocyte sedimentation rate
- Bleeding Time, Clotting time
- Urine: Albumin, Sugar, Microscopy.
- Blood sugar, Blood urea and serum creatinine
- HIV, HBsAg

**2. Radiography**

- X-ray chest

**3. Imaging studies**

- USG Scrotum and Colour Doppler

**4. Histopathology examination**

**7.4 Sample size**

**a) Sampling technique**

Convenience sampling  
All patients admitted in our hospital satisfying the criterias shall be considered for the study

**b) Sample size**

A minimum of 50 children will be included in the study.

**INCLUSION CRITERIA**

- Cases admitted with diagnosis of inguinoscrotal swelling.
- Complications like obstruction and strangulation of inguinoscrotal swelling.
- Age below 12 years.

**EXCLUSION CRITERIA**

- All patients above 12 years are excluded from the study.
- Patients who refuse surgery.
- Patient with systemic disorder not able to undergo surgery.
- Patients who left before completion of treatment.
- Patient with acute scrotal swelling like torsion of testis, epididymoorchitis, funiculitis, lymphadenitis.

**RESULTS**

**Table 1: Evaluation of age**

Mean age	5.01 years
SD	2.99
Median	4.5 years
Minimum age	1 month
Maximum age	11 years

The mean age of the patients at presentation was 5.01 years (SD:2.99) with a median age of 4.5 years. Age range included patient of 1 month of age to 11 years.

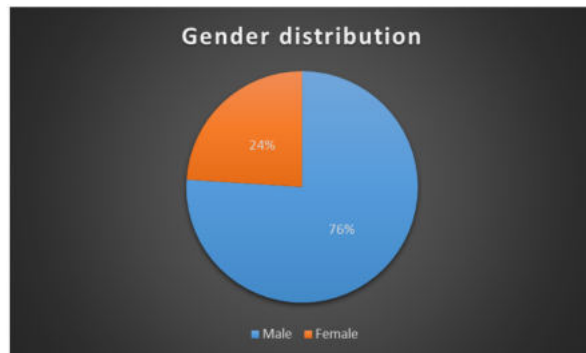
**Table 2: Age distribution**

Age distribution	No of subjects	Percentage
0-1 years	8	16%
2-3 years	14	28%
4-5 years	8	16%
6-7 years	8	16%
8-9 years	9	18%
10-11 years	3	6%
Total	10	100%

Age distribution was analysed. There were 8 patients up to 1 year of age (16%), 14 patients between 2-3 years of age (28%), 8 each were between 4-5 years and 6-7 years of age (16%), 9 were between 8-9 years (18%), 3 were between 10-11 years of age (6%).

Gender distribution	No of subjects	Percentage
Male	38	76%
Female	12	24%

The majority of the patients were males at 76% (n=38), females were 24% (n=12).



**Table 4: Primary diagnosis**

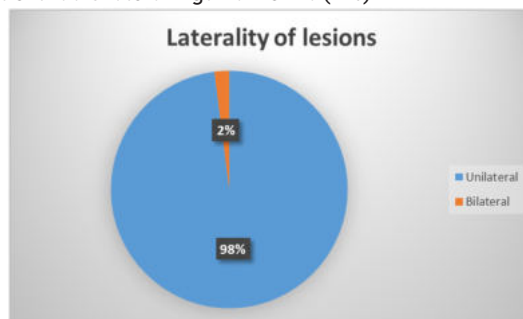
Primary diagnosis	No of subjects	Percentage
Inguinal hernia	50	100%
Hydrocele	1	2%
Torsion of testes	1	2%
Undescended testis	1	2%

1 patient had hydrocele with inguinal hernia (2%), another had torsion of testes with inguinal hernia (2%), 1 patient had undescended testis along with inguinal hernia (2%). All patients were diagnosed to have inguinal hernia (100%).

**Table 5: Laterality of swelling**

Laterality	No of subjects	Percentage
Unilateral	49	98%
Bilateral	1	2%

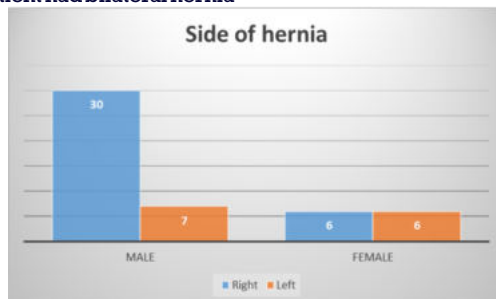
Majority of the swellings were unilateral 98% (n=49) and one patient had bilateral inguinal hernia (2%).



**Table 6: Side of swelling**

	Male	Female
Right	30	6
Left	7	6
P value	0.034	
Inference	Significantly higher number of hernia on right side in males	

1 patient had bilateral hernia

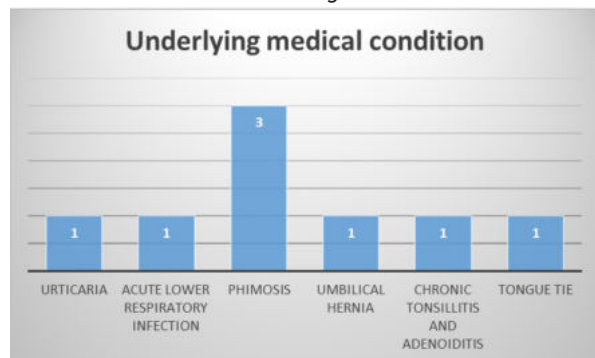


30 male patients had swelling on right side whereas 7 had swelling on the left whereas female patients had 6 each swellings on right and left. The difference was significant when the gender was compared. The P value was 0.0304. There were significantly higher number of hernia on right side in males.

**Table 7: Underlying medical conditions**

Underlying medical conditions	No of subjects	Percentage
Urticaria	1	2%
Acute lower respiratory infection	1	2%
Phimosis	3	6%
Umbilical hernia	1	2%
Chronic tonsillitis and adenoiditis	1	2%
Tongue tie	1	2%

Other significant medical conditions included 3 patients with phimosis (6%), one patient (2%) each had urticaria, acute lower respiratory infection, umbilical hernia, chronic tonsillitis and adenoiditis and tongue tie.



**DISCUSSION**

Inguinoscrotal swellings are one of the commonest occurrences in infancy and childhood globally. The incidence of inguinal hernia has been reported to range between 0.8%-4.4%, which roughly translates as 10-20/1000 live births [1]. Among the inguino-scrotal swellings, inguinal hernia and hydrocele top the list in frequency.

**Details of the study:**

The current study was conducted in 50 paediatric patients of up to 12 years of age who presented with either inguinal or inguino-femoral or inguinoscrotal swellings to a tertiary care hospital in Mangaluru.

Due informed consent explaining the objectives and the procedure of the study were explained to the parents/guardians of the children undergoing surgery for inguinoscrotal swellings. The same was explained to them in their native language. Children of parents or guardians unwilling to give an informed consent were not included in the study. Similar studies were conducted by other workers such as **Abantanga FA [29], Han BK [30], McAlister WH et al. [31], Koranga H et al. [32].**

**Evaluation of age:**

The mean age of the patients at presentation was 5.01 years (SD:2.99) with a median age of 4.5 years. Age range included patient of 1 month of age to 11 years as depicted in table 1.

Age distribution was analysed. There were 8 patients up to 1 year of age (16%), 14 patients between 2-3 years of age (28%), 8 each were between 4-5 years and 6-7 years of age (16%), 9 were between 8-9 years (18%), 3 were between 10-11 years of age (6%) as depicted in table 2 and corresponding graph.

**LIMITATIONS**

- 1) The sample size was small to extrapolate to national or regional level trends.

- 2) Majority of the swellings in our study included inguino-femoral swellings.
- 3) Cost-effectiveness of the procedure and treatment modalities was not performed.
- 4) There were higher number of male patients in our study with a skew away from females.
- 5) Long term follow up and evaluation of siblings was not performed.

**CONCLUSION**

As observed from our study a majority of the children were males; presented with inguinal hernia with occasional associated swellings of hydrocele and torsion of testes. In addition, phimosis that required circumcision was noted in the study population. Majority of the swellings were unilateral. Preterm births and family history were noted to be positive in considerable number of patients. The swellings were predominately on the right side in males with a significant difference when compared to females. The age of presentation was 5.01 years and many of the patients presented to hospital after a considerable time of presence of swelling. Complications included surgical site infections and reoperations in a small number of children. We propose similar studies in future with a higher patient sample size, long term follow up for complications, reasons for late presentation for treatment and cost effectiveness of treatment modalities.

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