

Clinical Presentation and Management of Congenital Inguinal Hernia and Hydrocele In Children

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ABSTRACT

Objective	To evaluate the age, gender, laterality of the lesions, surgical treatment provided and complications of congenital inguinal hernia and hydrocele surgery in children.
Study design	Descriptive case series.
Place & Duration of study	Department of Pediatric Surgery, Lyari General Hospital Karachi, from July 2023 to June 2024.
Methods	Data regarding age, gender, diagnosis, procedure performed, morbidity and mortality rate were recorded of all the patients of inguinal hernia and hydrocele who were managed as elective cases during the study period. Patients with associated anomalies were not enrolled. All procedures were performed under general anesthesia. Minimal invasive approach was not employed. Data were entered into analyzed using SPSS version 22. Descriptive statistics were used to present the data.
Results	A total of 105 patients were included in the study. There were 92 (87.6%) male and 13 (12.4%) female patients. Of the total 79 (75.2%) patients had inguinal hernias. In this category there were 66 male children. Twenty-two (21.0%) male patients had scrotal hydrocele while 4 (3.8%) had hydrocele of the cord. The most common presenting age group was between 5-10 years. Complication were noted in 5 (4.6%) patients following surgery; three had superficial wound infection and two developed residual scrotal edema. No recurrence was noted at follow up. In this series two children presented with metachronous hernia and operated.
Conclusion	Inguinal hernia and hydrocele were common congenital conditions in children. However, most common age at presentation was between 5 – 10 years. Open surgical approach for inguinal hernia was found safe with minimal postoperative complication.
Key words	Hernia, Hydrocele, Hydrocele of cord, Child. Congenital anomaly.

INTRODUCTION:

Congenital inguinal hernia and hydrocele are the most commonly diagnosed surgical conditions in the pediatric age group. These occur due to the patent

processus vaginalis which may be closed at birth or obliterates at variable time during infancy and later in childhood. However, it may remain patent throughout the life and remains asymptomatic. When processus vaginalis fails to close inguinal hernia or hydrocele may develop.¹

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The patent processus vaginalis affects 1-5% of full-term babies. However, its prevalence up to 30% is reported among premature infants. Boys are six times more likely to develop inguinal hernias than girls. The incidence of right-sided inguinal hernia is three times more than left-sided hernias. In premature babies bilateral inguinal hernias are more common.^{2,3} In males, the inguinal hernias more frequently contain

loops of small intestine. In females, ovaries are frequently reported as a content of inguinal hernia.⁴ In “females” with inguinal hernia, a high index of suspicion of androgen insensitivity syndrome should also be considered.⁵

Pediatric hernias frequently present as an inguinoscrotal swelling. They can also have other presenting features when the contents get trapped within the sac. This clinical situation has variable urgency and severity, ranging from irreducible inguinal hernia to the life threatening gangrene of the intestine due to compromised blood supply within the sac in addition to full blown features of intestinal obstruction. Delay in diagnosis and treatment leads to various complication such as loss of testis, ovaries or portion of bowel due to incarceration or strangulation.^{6,7} The objective of this study was to document the clinical presentation and outcome of the surgical treatment provided to the children who presented with inguinal hernia and hydrocele.

METHODS:

Study design, place & duration: This was case series was conducted in the Department of Pediatric Surgery, Lyari General Hospital Karachi, from July 2023 to June 2024.

Ethical considerations: Institutional Review Board approval (No.IRB/SMBBMC/Approval/2025/11 dated 16/08/2025) was taken and informed consent obtained from the parents.

Inclusion and exclusion criteria: All patients who were diagnosed with inguinal hernia and hydrocele were included. Patients with complications related to inguinal hernia like strangulation and those with associated congenital anomalies like neural tube defects, Down’s syndrome, and muscular dystrophies, were excluded.

Sample size estimation: A formal sample size was not calculated and all those children who presented with uncomplicated inguino-scrotal swelling were enrolled and form the population of this data analysis.

Study protocol: Data regarding age, gender, diagnosis, procedure performed, morbidity and mortality rate were recorded. All the children were managed surgically on elective operating list. Herniotomy or ligation of patent processus vaginalis were performed through inguinal skin crease incision under general anesthesia. All patients received a standard antibiotic dose at the time of induction of anesthesia. Patients stayed in the ward for 24-hours after surgery and then discharged on pain killer to be followed in the out-patient department at week-1 and 4, 3 months, 6 months, and one-year for any early postoperative complications and recurrence at a later date.

Statistical analysis: The data were entered into SPSS version 22 for analysis. Quantitative variables were presented as mean and standard deviation and qualitative variables as frequency and percentages.

RESULTS:

A total of 105 patients were included in the study. Males (n=92 – 87.6%) more frequently suffered from these anomalies. Inguinal hernia (n=79 – 75.2%) was more frequently reported condinas. The distribution is given in table I. Two patients in this series had metachronous hernia. Distribution of the anomalies in both genders and laterality are given in table II. According to the age distribution, 52 (49.5%) children were between 5 - 10 years, 31 (29.5%) of 1-5 years, 15 (14.3%) neonates and infants while 7 (6.7%) were above 10-years of age. Six (5.7%) inguinal hernias were of sliding type for which purse string suture were applied. This included four females and two males. Complication were noted in 5 (4.6%) patients and included superficial wound infection in three and scrotal edema in two patients. No recurrence was reported in this series till the last follow up.

DISCUSSION:

Congenital inguinal hernias and hydrocele are the most common pathologies in pediatric surgery practice all over the world. This study validated this observation as a large number of children with these

Table I: Diagnosis and Gender Distribution

Diagnosis	Gender		Total n%
	Male (n)	Female (n)	
Hernia	66	13	79 (75.2%)
Hydrocele	22	00	22 (21.0%)
Hydrocele of the cord	04	00	04 (3.8%)
Total	92	13	105

Table II: Frequency of Anomalies in Relation to Gender and Laterality

Gender	Right side n%	Left side n%	Both sides n%	Total n%
Male	57	29	06	92 (87.6%)
Female	05	06	02	13 (12.4%)
Total	62 (59%)	35 (33.3%)	08 (7.6%)	105

conditions presented to our clinical services. Our data showed male predominance as reported in other studies. Nearly 90% of the patients were males.⁸ The reason for high incidence in male is because of their anatomy. Processus vaginalis facilitates the descent of testes into the scrotum. This facilitation in some children may predispose to both the inguinal hernia and hydrocele if the tract does not obliterate at birth or at a later date.⁹ Persistence of processus vaginalis leads to trickling of peritoneal fluid into the scrotum and if the size is large, may allow bowel loops to herniate leading to indirect congenital inguinal hernia.

Early surgical intervention is recommended for inguinal hernia as chances of strangulation of bowel loops in the sac are high. However, hydrocele can be observed for variable period of time as small patent processus vaginalis may obliterate in infancy. In our study nearly 60% children had right sided inguinal hernia while bilateral synchronous lesions were uncommon and found in only about 8% of the patients. These findings are also in conformity with other studies.^{10,11}

Hydrocele was less frequently observed in this study as compared to the inguinal hernia. A possible reason for this observation might be the fact that many of such lesions noted at birth disappear as the patient grows older. An interesting type of anomaly related to the patent processus vaginalis observed in this study was hydrocele of the cord. Different theories have been proposed as to their origin. This may be an intermediate stage before complete obliteration of the processus vaginalis. There are reports that suggest proximal communication of these lesions with the peritoneal cavity and suggest surgical intervention as a mode of treatment.¹² We operated on all such patients in our series through inguinal approach though in literature scrotal route is also reported.¹³

In our study almost 50% of the patients presented between the age of 5 - 10 years followed by 30% between 1-5 years. Interestingly less number of infants were found in this series. This pattern is slightly different from the other studies.¹⁴ In our set up parents were quite reluctant to accept the surgical treatment for the inguinal hernia. They were quite

anxious. Parental anxiety is a known factor and well documented. An effective counseling helped the parents to cope with the stress. The art of communication must be learnt and should be part of the training programs.¹⁵

In our department, for infants who presented with inguinal hernias surgery was done only on the side of the lesion. There is controversy among the pediatric surgeons for the contra-lateral side exploration in the absence of a clinical evidence of inguinal hernia on opposite side. Different methods have been employed to identify contralateral hernias, but there is ongoing debate regarding their accuracy and necessity of such an additional procedure. In this study, at follow up we did not encounter any metachronous hernia on the opposite side. However, we did operate upon only two patients of previously were operated for inguinal hernia and developed metachronous hernia on opposite side. This strengthens the observation that development of such type of hernia is infrequent while bilateral exploration may increase the chances of damage to the spermatic cord and other general complications related to the prolonged duration of anesthesia and surgery in infants.^{16,17}

All surgeries in this series were performed through conventional open inguinal approach through a small incision. However minimal invasive surgeries for inguinal hernia and communicating hydrocele are becoming popular worldwide as an alternate to open technique for better cosmetic results and early recovery. However, these claims are not convincing as open procedures are also done as day care cases and single small incision is made without entering the peritoneal cavity. In addition, carbon dioxide related complications are avoided and the approach is cost-effective.^{18,19}

Sliding hernias are uncommon in pediatric age group. They are more frequent in girls than in boys. In our study six patients had sliding hernia of whom four were females. Complication rate was low in our study. It included superficial wound infection and seroma formation after patent processus vaginalis ligation. These complications were managed on outpatient basis and resolved in a week time. Long term outcome is still awaited but no recurrence of

hernia was noted during the follow up period. Similar findings are also reported in by other researchers.²⁰

LIMITATIONS OF THE STUDY:

This is a single center study and comprised of elective cases only. Open surgical approach was used in all patients though minimal invasive surgery is also offered to such patients.

CONCLUSION:

Inguinal hernia and hydrocele are a common congenital conditions in children. Open surgical approach resulted in good outcome with minimal morbidity. This approach was found safe and cost-effective.

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