Original Research Article

Inguinoscrotal swellings in childhood: a clinico-diagnostic approach to differential diagnosis

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ABSTRACT

Background: Inguinoscrotal diseases are one of the commonest group of disorders seen in clinical surgical practice. A wide range of swellings are seen in this region in children and includes hydrocele, torsion testis, ectopic testis, lymphadenopathy, inguinal hernias, cysts, epididymitis, orchitis, tumors etc. Vigilant clinical and radiological evaluation of inguinoscrotum for varying diseases helps in proper diagnosis and surgical management of its differential diagnosis.

Methods: The present study was conducted as an observational study over a period of 10 months and enrolled a total of 50 patients.

Results: In this study, 31 cases had hydrocele, 14 cases had inguinal hernia, 2 cases had epididymorchitis, 2 cases had lymphadenopathy and one case had idiopathic scrotal edema. Individual diseases had varying presentations, clinical findings and post-operative findings.

Conclusions: There is a varying broad spectrum of swellings in the inguinoscrotal region in young male children. It was concluded that proper clinical and radiological evaluation of the patient helps to timely diagnose the disease and hence help in identifying correct approach to the management of the case.

Keywords: Child, Hernia, Hydrocele, Inguinoscrotum, Swelling

INTRODUCTION

Inguinoscrotal diseases are one of the commonest group of disorders seen in clinical surgical practice. All age groups are affected with incidence of certain disorders being higher in specific age groups. A wide range of swellings are seen in this region including hydrocele, torsion testis, ectopic testis, lymphadenopathy, inguinal hernias, cysts, epididymitis, orchitis, tumors etc.1

Persistent processus vaginalis is the commonest cause of inguinoscrotal swelling in children. Males are affected three to six times more than females.2-4 The diagnosis of scrotal diseases has been a challenge for clinicians and urologist due to non-specific signs and symptoms in many cases. Since, the pathognomic clinical features are infrequently present in patients, hence the diagnostic problem is difficult in these cases.5 Investigations like colour doppler ultrasonography with a high-frequency transducer helps to characterize intrascrotal swellings depending on their morphology and vascularity. Hence, differentiation can be made between swellings that require urgent surgery and those that can be managed conservatively.6 In approximately 20% of the normal adult
population, patent processes persists throughout the life. Hence, not all the patent processes vaginalis result in the formation of hernia or hydrocele in a child.\textsuperscript{3} There is about 0.8–4.4\% incidence of inguinal hernia (10 to 20 per 1000 live births). A positive family history is seen in 20\% cases.\textsuperscript{7} The incidence is more in first year of life with peak in first month and 33\% cases in less than six months of age.\textsuperscript{3}

The incidence of inguinal hernia is associated with many conditions like epispadias, hypospadias, ambiguous genitalia, cryptorchidism, bladder extrophy, prune belly syndrome etc.\textsuperscript{8} Incidence in preterm neonates is approximately 30\%.\textsuperscript{9}

There are varying types of hydroceles in a child depending on the degree and site of obliteration.\textsuperscript{10} Only the hydrocele which stays beyond the age of two years and those which are associated with inguinal hernia require operative management. Rest of them resolve spontaneously with age.\textsuperscript{11,12} Incidence of femoral hernias is less than 0.5\% in cases of children. They mostly present as a swelling below and lateral to the sight of inguinal hernia.\textsuperscript{13,14}

Testicular torsion is an acute cause of scrotal swelling in children which presents as a surgical emergency. The child presents with acute pain and swelling in scrotum the extravaginal torsion seen in newborn infants (6\% of the total cases).\textsuperscript{15} Inguinal lymph nodes maybe enlarged in cases of infection in the area of lymphatic drainage of inguinal region. They may be mistaken for a hernia.\textsuperscript{12}

Scrotal edema can involve one or both sides of scrotum. It can cause minimum pain and local tenderness. It is usually confined to the subcutaneous planes. However idiopathic scrotal edema can mimic torsion or epididymorchitis in some cases. It generally subsides within 1 to 2 days with no requirement of treatment. Benign discoloration of the skin may persist after resolution of swelling.\textsuperscript{16}

### Aims and objectives

The main aim of the study was to study the spectrum of inguinoscrotal swellings in children and to evaluate the pre-operative clinic-radiological findings and post-operative findings in a child with scrotal swelling.

### METHODS

#### Study design

The present study was an observational study conducted under the Department of Surgery, Government Medical College, Jammu, Jammu and Kashmir, India.

#### Study period

The study was done over a period of 10 months from November 2018 to September 2019. A total of 50 patients were enrolled in the study.

### Inclusion criteria

All children <13 years age who presented with swelling in the inguinoscrotal region were included in this study.

### Exclusion criteria

Children >13 years age were excluded from this study.

### Sampling technique

Random (all children coming to hospital outpatient department (OPD)/emergency with inguinoscrotal swelling).

### Methodology

After obtaining consent from the patient, a detailed clinical history was elicited from the patient and their parents who presented to hospital with inguinoscrotal swelling. This was followed by general physical examination and systematic examination of patient. Thereafter, inguinoscrotal region was examined properly. All the routine laboratory investigations (complete blood count, total leukocyte count, routine urine examination etc.) and radiological examination including ultrasound doppler of inguinoscrotal region was done. The cases where surgery was indicated, a pre-anesthetic check-up was done prior to the procedure. All operations were conducted by a specialist surgeon and intra operative findings were confirmed. Post-operatively, patient was managed with prophylactic antibiotics and monitoring for 48 hours and discharged as per achieving the clinical goals. Patients were guided for routine follow-up in the surgical outpatient department (OPD).

### Statistical analysis

Categorical variables were summarized in terms of frequencies and percentages. Quantitative variables were assessed in terms of mean, median, mode, standard deviation, maximum, minimum and percentile values, if any.

### RESULTS

A total of 50 children were enrolled in our study. All the cases were male in our study. Age group varied from two months old to 11 years old with mean age of 3.5 years in our study. Maximum cases in our study were in the age group of 3 to 6 years age (30\%).

In this study, 31 cases had hydrocele, 14 cases had inguinal hernia, 2 cases had epididymorchitis, 2 cases had lymphadenopathy and one case had idiopathic scrotal edema (Figure 1).

A total 31 cases of hydrocele were found in our study with right side is to left side ratio of 3:1. In our study, no female child presented with the swelling in inguinal region. In our
study, 14 cases presented as inguinal hernia. The ratio of right-sided to left-sided hernias was 3.6:1 (Figure 2).

![Figure 1: Spectrum of inguinoscrotal swellings.](image1)

![Figure 2: Side of inguinal hernia.](image2)

A total 13 out of 14 cases of inguinal hernia were unilateral and complicated type. Only one case of complicated inguinal hernia which presented as an irreducible hernia was seen. All the cases were of indirect type in our study and underwent simple herniotomy as the surgical treatment of choice.

The recurrence rate in our study was found out to be 0.9%. No case which was operated for inguinal hernia returned back with the contralateral inguinal hernia during the follow-up in our study.

In this study, we had 2 cases of lymphadenopathy. Amongst them, one case had associated abscess in the region. Both these patients recovered completely within a week of antibiotic therapy and abscess drainage in one case. All the cases of epididymorchitis improved with conservative management.

The length of hospital stays varied from 1 to 7 days with average of 4.7 days. Most of the cases had a stay of 3.5 days (40% cases) in this study.

Six cases in this study developed subcutaneous edema in the post-operative period which improved within 2 to 4 days of time. Short-term complications were seen in six cases. However, no longer term complication was seen on follow up.

### DISCUSSION

In this study on 50 cases, 31 cases had hydrocele, 14 cases had inguinal hernia, 2 cases had epididymorchitis, 2 cases had lymphadenopathy and one case had idiopathic scrotal edema (Figure 1).

A total 31 cases of hydrocele were found in our study with right side is to left side ratio of 3:1. This is consistent with the study by Wilson D-Storey where 67% right sided, 25% left sided and 8% bilateral hydroceles were found.17 Three cases of hydrocele who were less than one year of age were not operated. They were told to watch the swelling and follow up in the OPD until two years age.

In our study, no female child presented with the swelling in inguinal region. This is consistent with an observation in studies by Abatanga et al and Bullantyne et al that most hernias occur in male child with sex ratio ranging from 4:1 to 10:1.18,19

In our study, 14 cases presented as inguinal hernia. The ratio of right-sided to left-sided hernias was 3.6:1 (Figure 2). This is in concordance with studies by Wilson D-Storey and Carneiro PMR that right-sided hernias are more common than left-sided or bilateral hernias. No case of bilateral hernia was seen in our study.17,20

In a study by Carneiro PMR, 271 patients were evaluated, and the recurrence rate of inguinal hernia was found to be 1.76%.20 Similarly, in a study by Venugopal, the recurrence rate was 1% in 397 cases.21 These findings are consistent with our study where the recurrence rate was found out to be 0.9%. No case which was operated for inguinal hernia returned back with the contralateral inguinal hernia during the follow-up in our study. Hence it can be concluded that no routine exploration of contralateral inguinal region should be carried out in cases of unilateral hernia. Hence, a proper clinical and radiological evaluation of the patient helps to timely diagnose the disease and help in timely management of patients.

Limitations of this study were authors had a small sample size of patients because of the limited cases admitted in our hospital during this tenure of study. However, it was tried to gain as many patients as possible from hospital.

### CONCLUSION

There is a varying spectrum of swellings in the inguinoscrotal region in young male children. Vigilant and careful clinical history followed by proper examination of the patient helps in making right diagnosis of the case.
Ultrasound doppler of the inguinoscrotal region helps to correlate the clinical findings with a strong support. Major chunk of these diseases is due to aberrations in the obliteration of processus vaginalis. Proper clinical and radiological evaluation of the patient helps to timely diagnose the disease and hence help in identifying correct approach to the management of the case.

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