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Original Research Article

A study of clinical evaluation and management of inguinoscrotal swelling in paediatric age group

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ABSTRACT

Background: Inguino-scrotal swellings are one of the commonest problems in infancy and childhood throughout the world. They represent the conditions most frequently requiring surgical repair in the paediatric age group. 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. Post-operative complications are usually rare following elective operation whereas minor complications do occur after emergency operation. In this study we evaluated various presentations of inguino-scrotal swellings, their management and complications in paediatric age group.
Methods: This is a hospital based prospective study, to have an overview of a spectrum of the paediatric cases admitted in the department of surgery with inguino-scrotal swelling that includes 40 patients with age below 13 years, irrespective of sex. Data regarding clinical features, birth history, immunization, family history various blood and radiological investigations was noted. Incidences of associated anomalies, complications and any form of treatment given to the patient were recorded and findings were analysed.
Results: Out of 40 cases, all were males with maximum number of cases between the age group of 3-4 years.24 cases were right sided, 12 left sided and 4 bilateral. Hydrocele was associated with 10 of the cases, undescended testis with 2 cases and 1 had encysted hydrocele of the cord. There were no complicated cases like incarceration, obstruction or strangulation. Post-operative complications were noted in 4 cases, out of which 2 were wound haematoma and one case each of wound infection and stitch granuloma.
Conclusions: Childhood inguinal hernias are more common on right side due to delay in descent of right testis and males are more commonly affected. Congenital hydrocele may involutes spontaneously, so we should observed at least upto 1 year of age before considering repair but not in the case of congenital inguinal hernia. Inguinal herniotomy in children is a safe and effective operation.

Keywords: Herniotomy, Hydrocele, Haematoma, Inguino-scrotal swelling, Inguinal hernia, Incarceration, Strangulation, Stitch granuloma

INTRODUCTION

Inguino-scrotal swellings are one of the commonest 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 as 10 to 20 per 1000 live births.[1] 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 at least upto 1 year of age before considering repair.

At birth, 4 out of every 100 males will have an undescended testis.[2] 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.

Inguinal herniotomy in children is a safe and effective operation. In general, infants and children require general anaesthesia 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-(1) cystic fibrosis [CF] (2) 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.

METHODS

This is a hospital based study carried out in AVMC under the guidance of Dr.R.Chandrasekaran, Professor, Department of General Surgery, to have overview of a spectrum of the paediatric cases admitted in the department of surgery with inguino-scrotal swelling during the time period of 5 months (December 2017 – April 2018).

Inclusion criteria

- Cases admitted with diagnosis of inguinoscrotal swelling.
- Complications like obstruction and strangulation of inguinoscrotal swelling.
- Age below 13 years.
- Both male and female.

Exclusion criteria

- Cases not willing for study.
- Cases not fit for surgery.
- Cases which left before completion of treatment.
- Cases with acute scrotal swelling like testicular torsion, epididimo-orchitis, funiculitis and lymphadenitis.

It included the 40 patients admitted in hospital with provisional diagnosis of inguino-scrotal swelling with age below 13 years, irrespective of sex.

A study was conducted and for all the cases, details of history regarding clinical features, birth history, immunization and family history was noted. Data regarding various blood and radiological investigations were entered.

All the operations were carried out under general anaesthesia with injection ketamine induction.

Injection Ceftriaxone 20mg /Kg/body weight was given before each operation. From the level of umbilicus to mid-thigh was painted with 10% povidone iodine solution and finally washed with rectified spirit. This was followed by sterile skin draping.

Incision was made in the supra inguinal transverse skin crease on the same side of hernia in case of children up to two years of age. For older children, oblique skin incision adequate in length to allow for visualization of the necessary structures was made above and paralleled to the inguinal ligament.

Bleeding usually was minimal and could be controlled easily. The subcutaneous tissues were bluntly separated to expose the scarpa's fascia, which was grasped and incised with scissors exposing oblique aponeurosis.

After safeguarding the ilioinguinal nerve, the cremasteric muscle was opened on the anteromedial surface thereby exposing the hernial sac, which was usually presented as a white and glistening membrane.

The spermatic vessels and the vas deferens were bluntly teased off from the hernial sac. The blunt dissection was carried on and completed when the neck of the sac was reached as indicated by the presence of extraperitoneal fat. To avoid injury, the vas deferens was not grasped with forceps. High ligation of the sac at level of internal ring was done. The testis was always replaced in an intrascrotal location.

In cases where the internal ring was wide enough, repair of the fascia transversalis was done with non-absorbable suture to narrow the deep ring.

In cases of undescended testis, testis was brought down and placed in the scrotum by making a sub dartos pouch.

In cases of encysted hydrocele of the cord, proximal part of the processus vaginalis was checked for its patency by the passage of a probe or injection of air or fluid.

For congenital hydrocele, high ligation of the patent processus vaginalis at the deep ring was done and the distal portion was kept slit open to prevent collection of fluid.

The external oblique aponeurosis was sutured with chromic catgut and the skin closed subcuticularly with vicryl.

The patients were usually discharged from the hospital from the seventh or the eight-day of operation. Postoperative follow up of the cases were done after one week, one month and 5 months.

Incidences of complications related to treatment given to the patient were recorded and treated accordingly. Findings were framed in tables and charts.

RESULTS

The present study was carried out including 40 children who were operated for Inguinoscrotal swellings at the Department of Surgery, Aarupadai Veedu Medical College and Hospital, Pondicherry from December 2017 to April 2018. The initial diagnosis was made from the history and clinical examination. All the operations were performed under general anaesthesia. The operating time ranged from 30 minutes to 90 minutes. The post-operative hospital stay ranged from 7 day to 10 days. The cases were followed up for a period of 6 weeks to 4 months.

Age distribution

The age of the patients ranged from 7 month to 12 year. They were divided into 12 groups, each with a gap of 1 year. The maximum number of cases were in the age group of 3-4 year (25 %) and the minimum number was in the age group 0-1 and 5-8 years (2.5% each year of age) (Table 1).

Table 1: Age distribution in paediatric inguinoscrotal swellings.

Age (Years)	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
No. of Patients	1	4	7	10	2	1	1	1	3	2	2	6
Percentage	2.5%	10.0%	17.5%	25.0%	5.0%	2.5%	2.5%	2.5%	7.5%	5.0%	5.0%	15.0%

Sex distribution

In this study of 40 children, all were males and no females (Table 2) (Chart 2).

Table 2: Sex distribution in paediatric inguinoscrotal swellings.

Sex	No. of cases	Percentage
male	40	100
female	0	0

Side distribution

Among these 40 cases, 24cases were on the right side, 12 cases on the left side and 4 cases were bilateral (Table 3).

Table 3: Side distribution in paediatric inguinoscrotal swellings.

Side	No. of cases	Percentage
right	24	60
left	12	30
bilateral	4	10

Associated congenital anomalies

In this series, there were 10 cases of hydroceles of which 7 were on the left side and 3 on the right side. There were 2 cases of undescended testis both were on the left side and located in the inguinal pouch. 1 case of encysted hydrocele of the cord was encountered on the left side.

Complications

In this series of 40 children, there were no cases of incarceration, strangulation or gonadal infarction.

Operation performed

The usual procedure for inguinal hernia in children was herniotomy. In this study, simple herniotomy with or without complete excision of the sac were done for all the cases. In case of partial excision, the distal portion was kept slitopen to prevent hydrocele formation. In the case ofencysted hydrocele of the cord, the proximal portion of the processus vaginalis was checked for its patency by passage of a probe or injection of air or fluid. High ligation of the patent processus vaginalis at the deep ring was done in case ofcongenital hydrocele while the distal portion was kept slit open. Undescended testis cases

underwent orchidopexy at the time of hernia repair and the testis was placed in the sub dartos pouch.

Post-operative complications

In the post-operative period of 40 children, there were 2 cases of wound haematoma, 1 case of wound infection and 1 case of stitch granuloma (Table 4).

Table 4: Post operative complications in inguinoscotal swellings.

Complications	No. of Cases	Percentage
Wound haematoma	2	5
Wound infection	1	3
Stitch granuloma	1	3

Recurrence

During the period of 5 months study there was no incidence of recurrence.

DISCUSSION

Age distribution

In this study the youngest was 7 months and oldest was 12 years but the majority of the cases were in the age group of 3-4 years accounting for 25% of the total cases. The findings are in accordance with those of Okuribido et al., who found47.4% of the cases in the age group of 3 to 7 years.[3] Adesunkanmi AR et al reported 71% of the inguinal hernias in a study of 208 children in the age group of 5 years and below.[4] Wright JE observed the age at presentation of 117 cases of inguinal hernia and found that 87% of the cases were less than 7 years of age, 65% were in the age group of 5 year or less and 25% were encountered in less than 1 year of age.[5] Salaymeh MT found that about one third of the patients in his study were found to have the hernia during the first year of life.[6]

Sex distribution

In all the studies of inguinal hernia in children there is male preponderance. In our study all patients were male.

Powell TG studied paediatric hernias over 3 year's period. Boys had a higher prevalence of hernia than girls (9.2:1).[7] Larsen RM found that the ratio of male and female being 102:9 (11:1).[8] More common on right side. Kiesewetter WB concluded that 85% were males and 64% were encountered on right side with 10% bilateral. [9]

Side distribution

There was predominance of right sided swellings (60%) in our study with 30% left sided and 10% bilateral. A study by Jadhav et al reported an incidence of 64% on right side.[10]

Larsen RM in a study of 111 cases of inguinal hernia in children found 60 cases on the right side, 39 cases on the left and 12 cases as bilateral.[8] Kiesewetter WB while treating 100 children for inguinal hernia and hydrocele found that 61 children had hernia on the right side, 29 on the left and 10 bilateral.[11] Potts WJ conducted studies on inguinal herniotomies in children below 12 years over a period of 5 years.[12] They found that 70% occurred on the right side and 9% associated with hydrocele. 17% was bilateral presentation. Boocock GR opined that preterm children had a preponderance of bilateral hernias in both sexes but the number of girls was small.[13]

Associated congenital anomalies

During the study 10 cases of hydrocele (7 left sided and 3 right sided), 2 cases of left sided undescended testis in the inguinal pouch and 1 case of left encysted hydrocele of the cord were found.

Potts WJ in a study of inguinal hernia in 600 children found hydrocele to be associated in 9% of the cases.[12] Scorer et al found that incidence of undescended testis was 30.3% in their study.[14] Duckett JW et al conducted 380 hernia operations in children during a period of 6 year. In their series, 51 hydroceles, 25 hydroceles of the cord and 15 undescended testis were found in association with the hernias.[15] Lynn B studied 240 inguinal hernia in children and found hydrocele to be associated in 17% of the cases and undescended testis in 8%.[16] Some studies state that male hydrocele, most commonly non-communicating hydrocele, accounts for 1–2% reported incidence of inguinal hernia, most commonly indirect inguinal hernia, is 5–50/1000 with a male-to-female ratio of 5:1.[17-23] According to few studies causes of inguinolabial swelling include hydrocele of the canal of Nuck, hernias and inguinal lymphadenitis.[24,25]

Even though none of the patients found to have any complications related to inguino-scrotal swellings, there are many studies in which certain associated complications have been found. Grosfeld JL, in view of the increased incidence of complications observed in pre-term new-borns with inguinal hernias, suggested delay in operative repair till infant weighs more than 2200gm.[26] Mc Gregor DB et al, conducted a study on children below 19 years of age, who had inguinal hernia repaired. Incarceration, coexistence of a hydrocele and concomitant cryptorchidism, occurred with 10%, 12% and 7% of the cases respectively.[27]

Venugopal S showed in his study that Incarceration occurred in 8.17% children, 14 of these were infants below 6 months of age. Incarceration was more common in males and on the right side.[28] Carneiro PMR observed that out of 19.7% children presented with incarceration 27% required emergency operation as preoperative

reduction was achieved in the remaining.[29] Lawrence R. Moss and Hatch EI reviewed patients who underwent inguinal hernia repair.[30] Nearly one fourth (24%) of the infants in the series had incarcerated hernias. Reduction was successful in 96%. Repair was performed during the initial 24 to 48 hours. 4 patients had recurrent hernias.

In this series, infants and children required general anesthesia for operative repair of inguinal hernia and hydrocele. Simple herniotomy was done for all the cases along with correction of associated anomalies.

In other studies Inguinal hernia repair is considered the most common surgical procedure in children.[19-23] Turner, Lennon M stated that cure of inguinal hernia in infants and children required simple removal of the sac.[31] Herzfeld G not only agreed with this opinion but also initiated outpatient surgery for these children at Edinburgh University.[32]

Oak Sanjay and et al did 110 laparoscopic surgery of inguinal hernia in children and opined that laparoscopic repair of inguinal hernia in children has proved to be feasible, safe and reliable technique.[33]

Post-operative complications

It comprised of 2 cases of wound haematoma, 1 case of wound infection and 1 case of stitch granuloma. All of them responded to conservative treatment.

Sarin YK observed during their study except for the minor scrotal heamatoma other complications were hardly seen.[34] Carneiro PMR had six years retrospective review of 397 herniotomies in380 children upto the age of 10 years and encountered 16 minor post-operative complication.[29] In a study after follow-up of 9 months, complications of scrotal edema were seen in 2.97%, heamatoma in 0.49% and wound infection in 0.99% of patients.[35] Moss LR in a study of 384 patients who underwent inguinal hernia repair during a 5 years period found 9 minor post-operative complications.[30] Study by Shahnam et al shows hematoma as common complication among other complications of inguinal hernia surgery.[36] In the study period of 5 months there was no recurrence case in the follow up.

Grosfeld JL et al, stated that 50% of the recurrent cases were detected within the first within the first 6 month of repair.[37] 60% of the children had co-morbid conditions like chest infection, malnutrition, anemia, wound infection, low birth weight etc. that might contribute to hernia recurrence.

Other causes of inguinoscrotal swelling include testicular torsion, undescended testis, retractile testis, epididymo-orchitis, inguinal lymphadenitis, paratesticular tumours and tumours of the inguinal region such as lipoma and liposarcoma. Although paratesticular tumours are uncommon, they should be taken into consideration in the differential diagnosis.[38]

Color Doppler ultrasonography is an accurate, safe and readily available imaging modality which can be used for the differentiation between different aetiologies of inguinoscrotal and inguinolabia swelling in infants for the sake of reaching an optimum decision on proper management.[39]

CONCLUSION

Inguinal hernia and hydrocele in children remain one of the most common congenital anomaly observed by surgeons. By careful history taking and examination these conditions can be diagnosed and promptly treated, and complications like obstruction and strangulation can be prevented.

Though it can develop at any age, even in the neonates, but majority of children develop it between the ages of 1 to 5 years.Regarding the sex prevalence, males are more commonly affected.The childhood inguinal hernias are generally more predominant on the right side and congenital anomalies like undescended testis and hypospadias can be associated with them.

An inguinal hernia will not resolve spontaneously and should be repaired as soon as possible after the diagnosis because of the risk of incarceration or strangulation. Open herniotomy is the operation of choice for inguinal hernias in children. These hernias can also be repaired laparoscopically.In the case of undescended testis, orchidopexy should be done at the time of hernia repair. Post-operative complications are usually rare following elective operation whereas minor complications do occur after emergency operation. Recurrence is usually rare if operated by experienced surgeons.

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