

# A Clinical Study on the Management of Inguinal Hernias in Children on the General Surgical Practice

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## ABSTRACT

**Background:** Inguinal and scrotal swellings are frequently encountered in the surgical practice, especially in children. It is also important to study the factors which are associated with inguinal hernia, especially in children, for its effective management.

**Objective:** To study the factors which are associated with inguinal hernia in children.

**Setting and Design:** A prospective hospital based study was undertaken in the Department of Surgery for a period of one year between 2001 to 2002. Children who were aged one day to 12 years were selected for the study. Out of 960 children who were admitted to the surgical ward, 50 children had inguinal hernia and they constituted the sample.

**Methodology:** The details regarding the clinical history and the examination details were collected by using a predesigned proforma. The data which was thus collected was analyzed by using the appropriate statistical tests.

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**Results:** The inguinal hernia in the study group was common in the 1-5 years age group. 90% of the study group was males; a swelling in the inguinal region was the commonest symptom. 70% of the study group was term deliveries; the swelling of the inguinal hernia was elastic in consistency in 35 cases. The swelling of the inguinal hernia was irreducible in two cases. The testis was palpable in 48 cases; a cough impulse was seen and felt in 48 cases. Tenderness of the swelling was present in 2 cases.

**Conclusions:** Inguinal hernia is a common congenital condition in children. Difficulties are commonly encountered by the surgeons to identify and to confirm the presence of inguinal hernia. This study will help in a better management of hernia in the paediatric age group by understanding the features of inguinal hernia.

**Key Words:** Inguinal hernia, Children, Swelling

## INTRODUCTION

Inguinal and scrotal swellings in children are frequently encountered in the surgical practice. Most of these swellings are congenital and they have an asymptomatic presentation. They are related to the descent of the testes and the processus vaginalis [1]. To date, the mechanism of the testicular descent is speculative, with various hypotheses being put forth, the most recent one being that of "WATER-TRAP" which was made by Heyns and Deklerk. The abnormalities in the descent result in ectopic or undescended testes. The undescended testis which is found in more than 90% of the cases, is associated with congenital inguinal hernias [2].

Congenital inguinal hernias are common in infants and children, for which surgery constitutes the most frequent method of treatment in the paediatric age-group. The difficulties which are encountered in paediatric inguinal hernia are operative difficulties which are connected with a thin transparent sac, which is the association with the undescended testis and the different opinions on the timing of the operation when the two conditions co-exist. The swelling in the inguinal region is described by the parent but the surgeon is unable to confirm its presence. Once the diagnosis is definite, the rule is to repair. The other difficulty is whether a contra-lateral exploration should be performed or not, and if so, whether the decision should be based on the site, age or sex. The few other difficulties are in the handling of the total situation in

the phenotypic females but karyotypic males, or when the hernial sac contains gonads that are testes; or to evaluate the role of spinal anaesthesia, particularly in premature babies; or the existence of a direct inguinal hernial sac in children; and the failure of the recognition and the repair of the sac, which results in recurrent inguinal hernia [3].

The recent trend is to manage inguinal hernia by herniotomy on a day care basis. Although a laparoscopic hernia repair is conducted in adults, there is little or no indication to use this technique in infants and children. But there are fewer studies which have been done on inguinal hernia in children in our country and in the world. This study was conducted with the aim of finding the factors which were related to inguinal hernia in children.

## MATERIALS AND METHODS

The present prospective, hospital based study was undertaken in the Department of Surgery, in Hubli, Karnataka State, for a period of one year between July 2001 to June 2002. Ethical clearance was obtained from the appropriate authority in the institution.

The ages of the children ranged from day one to 12 years and those children who were admitted with inguinal hernia in the paediatric surgical ward were selected for the study. A total of 960 children were admitted to the paediatric surgical ward during the study period. Of them, 50 children had inguinal hernia and they constituted the study sample.

The children who had congenital hydrocele were excluded from the study. The children with signs of obstruction and the risk of incarceration were definitive indications for surgery, particularly the preterm infants.

The congenital inguinal hernias were diagnosed by taking a detailed history from the parents in predesigned forms, followed by clinical examinations, investigations and management.

After obtaining the history, the children were examined systematically, which included an examination of the inguinal and the groin regions and the scrotum and its contents. The site, size, variability of the size, reducibility or any underlying straining for micturition and the presence or absence of the testis in the scrotal sac were noted. The respiratory system, the cardiovascular system and the abdomen were examined for any associated congenital anomalies. The children were also subjected to routine investigations of the haemoglobin levels, total leucocyte count, differential count, bleeding time, clotting time, the routine urine examination and abdominal ultrasound. The female children with hernias were evaluated for the disorders of sexual differentiation in the form of ultrasonography of the abdomen and checking for buccal Barr bodies.

After the pre-operative assessment, the affected part was prepared for surgery. The type of surgery was decided, depending upon the age of the child. If the children were of less than one year of age, the Mitchell Banks operation was performed, where herniotomy was done without opening the external oblique aponeurosis. If the children were of more than one year of age, the Ferguson's technique was performed, where herniotomy was done after opening the external oblique aponeurosis. After the surgery, the children were nursed in the post-operative wards with antibiotics. The post operative complications were treated and the children were discharged when they were fit. All the patients were asked to attend the Surgical Outpatients Department for follow-up as and when it was required, between 4 to 6 months. The relevant data of the 50 cases were tabulated by using suitable statistical methods and they have been presented here [Table/Fig-1].

	Age in years	Frequency	Percent
Age group	Less than 1 year	6	12.0
	1 - 5 years	26	52.0
	5 - 10 years	12	24.0
	More than 10 years	6	12.0
Sex	Female	3	6.0
	Male	47	94.0
Birth history	Term	35	70.0
	Pre term	15	30.0
<b>Total</b>		<b>50</b>	<b>100.0</b>

[Table/Fig-1]: Socio-demographic features of the study group

## RESULTS

Out of the 960 cases who were admitted to the surgical ward, 50 had inguinal hernias. Most of the children belonged to the 1-5 years age group. About 94% of them were males and only 6% of them were females. Thirty five cases in the study group were term deliveries and 15 cases were preterm deliveries with signs of obstruction. They were operated in view of the risk of incarcerations.

A swelling in the inguinal region was the commonest symptom

which was presented by the patient attenders. It was followed by the swelling and absence of the testes in five cases. One case had swelling with pain and fever and another had pain and inability in reducing the swelling. The swelling in the inguinal region was present for 1 to 2 years in 90% of the cases.

Among the study sample, the symptoms were studied and it was found that a majority of the cases (43) presented with swelling, and the next common presentation was the absence of the testes (5 cases). In the other cases, swelling, pain, fever, and irreducibility were the symptoms.

The swelling of the inguinal hernia was elastic in consistency in 38 cases. In 10 cases, it was soft and in two cases, the swelling were tense and tender. In 48 cases, the swelling of the inguinal hernia was reducible, the testis was palpable and a cough impulse was present. The swelling was tender in 2 cases. Most of the swellings were elastic in consistency, and only in few cases, the swellings were irreducible or tender or the testes were not palpable [Table/Fig-2].

	Frequency
Bilateral inguinal hernia	2
Right congenital inguinal hernia	27
Obstructed right congenital inguinal hernia	1
Left congenital inguinal hernia	20
<b>Total</b>	<b>50</b>

[Table/Fig-2]: Distribution of the study group according to the diagnosis

The duration of the stay of the patients after the surgery was one day. In 47 cases, the post-operative follow up was uneventful and three cases did not return for follow up.

Three female children with hernias were operated and the sac contents were identified as fallopian tubes, ovaries and coils of intestines in one case; the sac contents were only coils of intestines in the other two cases.

## DISCUSSION

Inguinal and scrotal swellings in children form a majority of the surgical conditions which require treatment. Inguinal hernia repair is the most frequently performed operation in the paediatric age group. Studies from various centres have reported an incidence of 3.5 to 5.0% for the inguinal hernias in full term infants and an incidence of 44 to 55% in premature and LBW babies [4,5]. In our study, a 30% and a 32% incidence were seen in premature babies and in low birth weight babies respectively. The studies of Rowe et al., [6] and Grosfeld [2] et al., reported an incidence of 55%-60% of the inguinal hernias on the right side, that of 25% on the left side and that of 15% bilaterally. In this study, among the 50 cases, congenital inguinal hernias accounted for 54% of the hernias on the right side and for 42% on the left side and for 4% which occurred bilaterally. Most often the herniae are asymptomatic, which are detected during the first few years of life and at birth in premature babies. In this study, the commonest age of presentation was between 1-5 years (42%), the youngest baby being 1.5 months old.

In the study series of Grosfeld [2,3] et al., the male to female ratio was 9:1. The incidence was 7:1 in the present study and three female children presented with an inguinal hernia with ratio of 15:1.

Associated congenital anomalies have been described by Weber et al., with hernias being present in over 90% of the babies with cryptorchidism. Grosfeld and Conney described a 16% incidence of the previously unrecognized inguinal hernias following VP shunts [7].

Routine hernia repairs are performed on a day care basis. In this study, most of the patients were treated as in-patients, with the average duration of the hospitalization being between 1-6 days. The reasons for this being the necessity of performing the investigations as in patients and the unavailability of adequate anaesthetic and neonatal facilities in the postoperative period (most of our patients were from remote village areas).

A controversy exists for routine contra-lateral exploration in the absence of a clinical inguinal hernia. Various modalities have been described for detecting contra-lateral hernias, but their efficacy and necessity are debatable. Holder and Rescorla et al., recommended a routine exploration of the opposite site. The recent consensus is on a contra-lateral exploration, only when it is indicated. In this study, only the side with an obvious hernia was operated on. Direct inguinal hernias in children are rare and they represent 0.5% of all the groin hernias [8,9]. Fonkalsrud et al., reported 13 patients with direct inguinal hernias amongst 5,452 operations for inguinal hernias which were done over 17 years. Wright J.E. reported 19 direct inguinal hernias in 14 patients among over 1,600 inguinal hernia operations. In the present study, direct hernias constituted 4% of all the inguinal hernias.

Rowe and Lloyd reported incarcerations of the congenital inguinal hernias in 17% of the right sided hernias and in 7% of the left sided hernias, the overall rate being 12%. In this study, 2 cases of incarcerations were present in right sided congenital hernias (4%) in 2 years and 1.5 years old children; they were treated by an emergency exploration and repair, since the attempts at a reduction had failed. Rowe et al., recommends elective surgery after a reduction, since it has a lower rate of complications as compared to an emergency surgery (1.7% vs. 22.1%). But in our study, both the cases were operated as emergency explorations, as the reductions failed and no operative or post operative morbidity was noticed [6].

Sliding inguinal herniae are uncommon in children. They are more common in girls than in boys. In the study series of Grossed et al., ovaries and fallopian tubes were found in the sacs in as many as 15% of the hernias in girls. The structures which were encountered in the sliding herniae were the caecum, appendix, bladder, sigmoid colon and rarely, the uterus. In the present study, one child had a sliding inguinal hernia on the right side, which contained the appendix [2].

The recurrence in the childhood inguinal herniae is less than one percent. In the study of Wright et al., recurrences were encountered in over 1,600 inguinal hernia operations. The studies of Grosfeld demonstrated a higher incidence of hernias in older children. The recurrences ranged from 3 weeks to 4 years in Wright's study. 80% of the recurrences in children are noted within the first post-operative year. In our series, there were no cases of recurrent herniae [3].

Undescended testis is an anomaly which is commonly associated with congenital inguinal hernias. Scorer and Farrington found that 30.3% of the premature infants had undescended testes, whereas there was only a 3.4% incidence in full term babies and

by one year of age, the incidence was approximately 0.8% [10]. According to Witherington et al., a patent processus vaginalis with an undescended testis is an undisputed indication for orchiopexy [11]. In this study, five cases of undescended testes presented with associated inguinal hernias, which constituted 10% of the anomalies which were associated with inguinal hernias. Three cases were treated with orchidectomy and two cases with orchiopexy.

Almost all the hernia patients who underwent herniotomy had small amounts of fluid in the hernial sacs. According to Mlay and Sayi, the commonest site for the undescended testis is the superficial inguinal pouch. In our study, in four patients, the undescended testes were seen in the superficial inguinal pouches and in one case, it was found in the inguinal canal. In this study, we noticed that the commonest site was the superficial inguinal pouch [12].

## CONCLUSION

Inguinal hernia is a common congenital condition in children. The general surgeons often face difficulties in identifying and confirming the presence of the inguinal hernias. This study was an effort to identify such difficulties and also to find the clinical characteristics of the children with inguinal hernias. Most of the inguinal hernias in this study were congenital and they included the children who were between 1–5 years, especially male children. A swelling in the inguinal region was the most common symptom. Most of the swellings were elastic in consistency and reducible, the testes were palpable, and a cough impulse was seen in a majority of the children. The inguinal hernias were common on the right side and the follow ups of the patients were uneventful.

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