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Profile of Children with Recurrent Inguinal Hernia in a Teaching Hospital in Enugu, Nigeria

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Abstract

Background: *Inguinal hernia repair is one of the most performed surgical procedures in children. The aim of this study was to evaluate our experience in the management of children who had recurrent inguinal hernia.*

Materials and Methods: *This was a retrospective study of children aged 18 months and below who had surgery for recurrent inguinal hernia between January 2008 and December 2017 at the pediatric surgery unit of Enugu State University Teaching Hospital (ESUTH) Enugu, Nigeria.*

Results: *A total of 1577 cases of inguinal hernias were repaired during the study period. Out of this number, 47 patients developed recurrent inguinal hernia which represents 2.9%. There was male predominance and the median age of the patients was 6 months. About two thirds of the hernias were right sided and a bulge/swelling at the site of the previous hernia repair was the most common presentation. Missed patent processus vaginalis was the most common intra-operative finding and high ligation of the hernia sac was the most performed procedure. Surgical site infection was found to be the risk factor associated with recurrent inguinal hernia. There was no mortality.*

Conclusion: *Recurrent inguinal hernia in children may occur following repair of inguinal hernia. Missed patent processus was found in most of the patients. Wound infection should be avoided because it is associated with increased risk of hernia recurrence.*

Keywords: *Children, hernia, hospital, inguinal, recurrent.*

Introduction

Inguinal hernia is one of the most common pediatric conditions in children and the most common hernia repairs performed today in the pediatric population are for inguinal hernia [1]. Inguinal hernia is a congenital lesion resulting from failure of closure of patent processus vaginalis. Inguinal hernia is more common in males with a reported incidence of 3.5 to 5% in term babies [2, 3]. Repair of inguinal hernia is the most frequently performed surgery in pediatric surgery practice [4]. Recurrent hernia entails a breakdown of a previously repaired hernia. Recurrent hernia present as a bulge at or near the site of prior hernia. Recurrent hernia increases the technical complexity of subsequent repair. The occurrence rate of recurrent inguinal hernia after uncomplicated inguinal hernia repair is reported to be 0.5 to 1% [5]. However, recurrence rate following repair of complicated inguinal hernia is quoted as 0.5 to 3.8% [6]. The reasons why inguinal hernias recur is multifactorial which include technical and non-technical risk factors [7]. Co-morbid conditions such as increased intraabdominal pressure (ventriculoperitoneal shunts), growth failure, prematurity, chronic pulmonary disease, connective tissue disorder and malnutrition increases the risk of hernia recurrence [8]. Most recurrent hernias result from tearing of a friable sac, slipping of the ligature at the neck of the sac, or failure to ligate the sac high at the internal ring [1]. A common criterion for measuring the outcome of inguinal hernia repair is the recurrence rate [9]. The aim of this study was to evaluate our experience in the management of children who had recurrent inguinal hernia.

Materials and Methods

This was a retrospective study of children aged 18 months and below who had surgery for recurrent inguinal hernia between January 2008 and December 2017 at the pediatric surgery unit of Enugu State University Teaching Hospital (ESUTH) Enugu, Nigeria. For the purposes of this study, recurrent inguinal hernia refers to reappearance of inguinal hernia after an initial attempt at repair. Patients who underwent initial surgery for inguinal hernia at a peripheral hospital, developed recurrence, before referral to ESUTH for reoperation, were included into the study. Patients with incomplete medical records were excluded from the study. ESUTH is a tertiary hospital located in Enugu, South East Nigeria. The hospital serves the whole of Enugu State, which according to the 2016 estimates of the National Population Commission and Nigerian National Bureau of Statistics, has a population of about 4 million people and a population density of 616.0/km^2. The hospital also receives referrals from its neighboring states. Information was extracted from the case notes, operation notes, operation register, and admission-discharge records. The information extracted included age, gender, interval between initial repair and recurrence, interval from recurrence to treatment, presenting symptom, intra-operative finding, operative procedure performed, factors that may have predisposed to hernia recurrence, complications of surgery, duration of hospital stay and outcome of treatment.

Protocol

Under general anesthesia, access was through an inguinal crease incision which may be extended laterally if there is an irreducible viscera. The definitive surgery performed was dependent on the findings at surgery. The procedures were performed either by medical officers, resident doctors or by a pediatric surgeon.

The follow-up period was 12 months. Ethical approval was obtained from the ethics and research committee of ESUTH. Statistical Package for the Social Science (SPSS) version 21, manufactured by IBM Corporation Chicago, Illinois, was used for data entry and analysis. Data were expressed as percentages, median, mean, and range.

Results

Patients' Demographics

A total of 1577 cases of inguinal hernias were repaired during the study period. Out of this number, 47 patients developed recurrent inguinal hernia which represents 2.9% of the cases. These 47 patients formed the basis of this report. Details of the patients' demographics are shown in Table 1.

Table1. *Demographic profile of the patients*

Gender	
Male	40 (85.1%)
Female	7 (14.9%)
Median age	6 months (range: 1-18 months)
Side of hernia	
Right sided	29 (61.7%)
Left sided	18 (38.3%)
Interval between initial repair and recurrence	6 months (range: 3-15 months)
Interval from recurrence to treatment	6 months (range: 1-12 months)
Mean duration of hospital stay	9 days (range: 6-12 days)

Presenting Symptoms

All the patients presented with a bulge/swelling at the site of the previous hernia repair. In addition, 7 (14.9%) patients had abdominal pain, 4 (8.5%) had vomiting while 2 (4.3%) patients had constipation.

Intra-Operative Finding and Procedure Performed

These are shown in Table 2.

Intra-operative finding	Operative procedure performed	Number (%)
Patent processus vaginalis	Ligation of the processus	27 (57.4)
Wide inguinal ring	Narrowing of the inguinal ring	19 (40.4)
Lax connective tissues	Mesh repair	1 (2.2)

Factors that may have Predisposed to Hernia Recurrence

Thirty seven (78.7%) patients had surgical site infection in the initial surgery, 8 (17%) patients had their surgery performed by medical officers who are not specialists and 1 (2.1%) patient was found to have lax connective tissues. No risk factor was discovered in 1 (2.1%) patient.

Complications following Treatment of Recurrent Rernia Repair

Four (8.5%) patients developed suture complications such as stitch sinus and stitch granuloma while 2 (4.3%) patients had hypertrophied scar.

Outcome of Treatment

One (2.1%) patient required a repeat redo-surgery for the treatment of the recurrent hernia. All the patients recovered and were discharged home. There was no mortality.

Discussion

In large published series, inguinal hernia recurrence is still a frequent problem [10]. In developing countries, paucity of data makes determination of inguinal hernia recurrence rate inaccurate. Although laparoscopic pediatric inguinal hernia repair is gaining popularity, in low income countries open surgery is still the predominant modality of treatment [11]. The definitive reason for inguinal hernia recurrence still remains unclear. Some risk factors such as surgical technical methods, surgeon's experience and patient related factors have been postulated [1]. Such patient related risk factors include growth failure, prematurity, malnutrition, cryptorchidism and seizure disorders with spasticity [8].

In the present study, there is male predominance. This male predominance is consistent with the report of other authors [8, 13]. One study from Iran reported the occurrence of recurrent inguinal hernia only in males [13]. The higher incidence of inguinal hernias in males may explain this. The median age of our patients is at variance with the report of other researchers [13, 14]. The age of the patients who are treated for recurrent inguinal hernia may depend on the age at initial surgery. The predominance of right sided recurrent inguinal hernia documented in the present study is in line with the report of Askarpour et al [13]. The explanation for this may be due to the fact that inguinal hernias are more common on the right side [1]. The interval between initial hernia repair and hernia recurrence reported in the present study is similar to the report of Grosfeld et al [8]. The time it takes inguinal hernia to recur may dependent on the presence or absence of risk factors that predispose to hernia recurrence. For instance, children who strain to micturate or defeacate are at higher risk of developing recurrent inguinal hernias. The mean interval of 6 months before repair of recurrent inguinal hernia was the time required for scar tissue maturation and proper tissue plane delineation. The duration of hospitalization of children who underwent repair of recurrent inguinal hernia may depend on the nature (elective/emergency) of the surgery, extent of the operative procedure and condition of the patient post-operatively.

A bulge/swelling in the inguinal area of previous surgery is the consistent finding in recurrent inguinal hernia. The presence of other symptoms such as pain and vomiting may be associated with complications such as bowel incarceration, obstruction or strangulation.

The operative procedure performed on children with recurrent inguinal hernia is dependent on the possible etiology of the recurrence which is found at surgery. Patent processus vaginalis, which is the primary pathology in congenital hernias, may be missed at initial surgery. Obney and Chan in a study of 1057 cases of recurrent inguinal hernia reported that about one-third of the patients with patent processus were missed [15]. Grosfeld et al reported high ligation of the hernia sac (patent processus) in the treatment of recurrent inguinal hernia in children [8]. Widened inguinal ring as seen in large inguinal hernia is associated with recurrence because of attenuation and overstretching of the tissues [16]. Hence, proper

narrowing of inguinal ring or use of mesh may be required. Sarah et al reported the use of mesh for the repair of recurrent inguinal hernia in children [1].

Surgical site infection was the most common post-operative complication following the initial hernia repair. About 50% of recurrent inguinal hernias result from infection [17]. Rutkow and Robbins reported that one third or more of infected groin hernia repairs result in recurrent hernia [18]. Another factor which may predispose to recurrence is the experience of the surgeon. Robson et al reported high recurrence rate when inguinal hernia repair is performed by inexperienced junior trainees [19]. Pathologies affecting connective tissues may predispose to recurrence following inguinal hernia repair. Grosfeld et al reported connective tissue disorder as a risk factor affecting hernia recurrence [8]. Complications from the sutures such as stitch granuloma may result in cutaneous complications. Gan and Wastie reported suture granuloma mimicking urachal tumour [20].

There was no mortality in the current series. Other series also did not record any mortality [12, 13]. However, Sulkowski et al reported a mortality of 0.6%. [21] Mortality following recurrent inguinal hernia repair may be dependent on the general condition of the patient at surgery, presence or absence of complications and extent of operative procedure performed.

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