Day-Case Herniotomy Surgery for Children with Inhalational Anaesthesia in Lagos, Nigeria

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Abstract

Introduction: Inguinal herniotomy is a common surgical procedure in Nigeria and may sometimes require hospital admission. In most low-income countries, bed spaces are inadequate and waiting lists for surgery long. We reviewed morbidity and mortality of herniotomy cases operated under inhalational anaesthesia and managed as day-cases in our hospital between 2004 and 2006.

Materials and Methods: Relevant data was extracted from the medical records of all the children that had herniotomy surgery under inhalational anaesthesia in our hospital during the period. The data included the demography, side of swelling, post operative complications and time required for full recovery from anaesthesia.

Results: A total of 181 patients were operated within the period, with a male to female ratio of 19.1:1. The hernia was right sided in 138, (76.2%) and bilateral in 6.1%. The hemoglobin level was between 10-12g/dL in 168 (73%) of the children. All the children recovered fully from anaesthesia within 4 hours of surgery and tolerated food before going home. Post-operative vomiting occurred in 3 (1.67%) and scrotal swelling in 1.11% cases.

Conclusion: Inhalational anaesthesia is safe for day-case herniotomy surgery in selected children, and preoperative preparations carried out on out-patient basis.

Introduction

Inguinal herniotomy is the surgical correction of inguinal hernias in children. Worldwide, it is the condition most commonly requiring operation in children and is quite common in Nigeria [1, 2]. Managing these cases may sometimes involve hospital admission. The preoperative admission is for laboratory workup and anaesthetic assessment. Though considerable progress has been made in developing the health care sector in low-income countries like Nigeria, hospital bed space is still inadequate and waiting lists for surgery too long. Public expenditure on health care has not kept pace with growth in the need.

Even in those developed countries where the cost of health care soared too much, various methods have been devised to reduce it. Medical insurance has encouraged procedures with shorter hospital stay [3]. The patients go home to the care of their families. For children, mothers or both parents provide the continued care.

In a shorter-stay arrangement, a child is admitted the day before surgery and is discharged 72 hours after surgery if there are no complications. However this
method still takes up bed space.

In the day-case option, anesthetic evaluation and surgery are carried out on the same day and the patient is discharged from the recovery room. It has been shown to be safe and effective in a number of clinical situations including cleft lip surgery [4, 6]. In these situations it has not caused increased morbidity or mortality. Day-case surgery results in considerable reduction in the treatment costs and pressure on hospital beds [7, 8].

We therefore undertook a study of the morbidity and mortality of day-case herniotomies performed under inhalational anaesthesia during a period of two years.

Patients and Methods

We carried out a retrospective study of children that underwent herniotomy surgery under inhalational anaesthesia at the Pediatric Surgery unit of the Lagos State University Teaching (LASUTH) on day-case basis between January 2004 and October 2005. We also evaluated the effectiveness of out-patient assessment and preparation for these operations.

The cases were identified from a logbook and their records retrieved from the medical records department. Relevant data was then extracted from these records. These included: age, sex, hemoglobin level, genotype, side of swelling, and history of any related systemic illness. The anaesthetic procedures and operative methods were noted. The time for full recovery from anesthesia and resumption of feeding was noted. The presence of complications at follow up clinics was also noted.

These cases had been managed according to a specific plan. The parents and guardians were educated on the advantages of the day-case option. They were educated on post-operative care of the children, including how to monitor respiration, hemorrhage and how to report observed complications.

The children were brought to the hospital in the morning after six hours fast and were examined by an anesthetist to confirm fitness for general anesthesia.

Anaesthesia

Anaesthesia was induced in the patients via the inhalational route using halothane in 50% nitrous oxide and oxygen using a Mapleson F breathing-circuit. The trachea was intubated via the oral route under the inhalation anaesthesia or muscle paralysis facilitated by suxamethonium. The tracheal tube was secured with strapping and pharyngeal pack inserted to prevent airway soiling. Intravenous fluid 4.3% Dextrose in 0.18% saline was administered at the rate of 10 ml/kg/hour. The children were monitored by auscultating the precordium, and by oximetry, ECG, capnography, pulse rate and blood pressure checks.

Anaesthesia was maintained with 0.5% halothane in 50% nitrous oxide in oxygen. Ventilation was facilitated by atracurium and intravenous analgesia given. Reversal commenced as soon as skin closure was started by the surgeon and extubation was done with the patients awake and with intact airway reflexes. Oxygen was given via face mask till the patient was fully awake.

Surgical Procedure

The patients were all listed as first cases and operated within three hours of commencement of surgery on all operating days. All the operations were performed by specialists. Skin crease incisions are made just above the pubic tubercle and dissected through the deeper layers to reach the spermatic cord. This is incised longitudinally to expose its content. The hernia sac is identified, dissected free of the surrounding tissue up to the inguinal ring and the neck identified. The sac will be twisted to empty it of any content and the neck ligated. The sac distal to the neck will be excised and incisions closed back in layers with absorbable sutures [9]. The patients were given water by a nurse at full recovery and spent 4 hours in the recovery room. They were then handed over to their parents to feed and take home.

Follow-up

Patients were reviewed 24 hours after surgery at the surgical out-patients clinic. They were next seen one week afterwards for change of dressing or removal of stitches when necessary. Another review was done 2 weeks after surgery and patients finally discharged at the 3rd visit a week later if there were no problems.

Exclusion criteria

Children with the following conditions were not allowed in the day-case plan: i. Sickle cell haemoglobinopathies; ii. Parents / guardians that could not cope with the post operative instructions; iii. Presence of other serious congenital anomalies.

Children deemed unfit for general anaesthesia for
any reason were also excluded from the study.

Results

A total of 181 patients operated on during the period were considered in this study.

The characteristics of the cases were as shown in Table 1.

Table 1: Characteristics of the cases that were studied.

<table>
<thead>
<tr>
<th>(a) Total number of cases</th>
<th>181</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) Gender distribution of the cases-</td>
<td></td>
</tr>
<tr>
<td>Males-</td>
<td>172</td>
</tr>
<tr>
<td>Females-</td>
<td>9</td>
</tr>
<tr>
<td>Male : Female (M:F) ratio</td>
<td>19.1 : 1</td>
</tr>
<tr>
<td>(c) Age of the cases</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>3.5 months-12 years</td>
</tr>
<tr>
<td>Mean (±Standard deviation)</td>
<td>4.2 ± 2.8 years</td>
</tr>
<tr>
<td>Distribution pattern of the ages</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>Frequency</td>
</tr>
<tr>
<td>0 - 1.0</td>
<td>22</td>
</tr>
<tr>
<td>1.1 - 2.0</td>
<td>42</td>
</tr>
<tr>
<td>2.1 - 5.0</td>
<td>68</td>
</tr>
<tr>
<td>5.1 - 10.0</td>
<td>42</td>
</tr>
<tr>
<td>10.1- 14</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
</tr>
<tr>
<td>(d) Anatomical distribution of the groin swellings-</td>
<td></td>
</tr>
<tr>
<td>Side</td>
<td>Number of cases</td>
</tr>
<tr>
<td>Right</td>
<td>138</td>
</tr>
<tr>
<td>Left</td>
<td>32</td>
</tr>
<tr>
<td>Bilateral</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
</tr>
</tbody>
</table>

Haemoglobin level was between 10-12 g/dl in 168 (73%) of the cases.

All the cases recovered fully from anaesthesia, were feeding within 4 hours of surgery and discharged home same day. No post-operative anaesthetic complications occurred in any of the children.

Oral analgesics drugs were given for post-operative pain control in all the patients. Antibiotics were not used in all the cases.

Post-operative vomiting occurred in 3 (1.67%) and scrotal swelling in 2 (1.11%) cases.

There was no case of post-operative wound infection or recurrence.

Discussion

Patients for surgery are often admitted into the hospital a few days before and after surgery. This practice has led to long waiting lists and treatment delays. A number of studies have established the safety of day case surgery, even when performed under general anesthesia.

Inguinal hernias are common forms of groin and scrotal swellings in children in Nigeria and indeed anywhere else. They are far more common in males. This was confirmed in this study. In the male fetus, the testis descends from the abdomen into the scrotum, traversing the inguinal canal on its way. It is preceded in this process by a peritoneal covering; the processus vaginalis which is obliterated soon after birth though it may remain patent for up to 14 days in 70% of infants. Persistence of all or parts of this peritoneal tube causes a variety of inguinal anomalies including congenital hernias and hydroceles [10, 11]. The right sided preponderance of inguinal hernias as shown by previous studies [11] was also confirmed in this study.

Several studies have shown the beneficial effects of day case surgeries in appropriately selected cases [12, 14]. Kim and Rothkopf found no complications in patients who underwent day care surgery [15]. It was found to reduce the incidence of nosocomial infections [6]. Alade has therefore proposed that the day-case option be used for external hernias in adults in the tropics [1]. Proper selection of patients is quite important in these situations though [16].

The use of ketamine for general anesthesia has been previously established as safe for day case herniotomy in children [17, 18]. This is commonly used in Nigeria [7]. Ketamine induces dissociative anaesthesia. It however has certain disadvantages that may be significant in day case surgical cases. The muscles are not relaxed. Straining in the child and the significant tissue manipulation that takes place in cases where reduction of herniating structures is performed may delay post operative intestinal recovery. Full recovery from anaesthesia sometimes takes more time and may be delayed in some patients. More importantly it increases salivary secretion and may cause post-operative airway infection and “drown” the lungs in extreme cases.

Inhalational anaesthesia with halothane was used in this study. The use of inhalational anaesthesia for day-case surgery in children is hitherto not very common in our environment. Halothane has a sweet odour and is...
not irritating to patients [19]. The patients recovered fully and rapidly after operation in this study. Vomiting was reported when feeding was resumed in three patients. This may have been caused by a slight delay in recovery. In these cases, feeding was interrupted and recommenced 2 hours later with no recurrence of vomiting. All the patients were sent home on the day of surgery. The frequent patient follow-up in the study was to ensure that any complication if any that developed in the cases were reviewed on time and appropriate management commenced. This was necessary in our environment with peculiar communication difficulties.

Scrotal edema occurred in only two children. This could have resulted from tissue manipulations during the surgery. This resolved within a week.

This study has shown that preparation of selected surgical patients can be carried out from home and patients admitted on the day of surgery. It also shows that day case herniotomy using inhalational anaesthesia is safe. Proper selection of patients, parent education, pre-operative assessment, and recovery room nursing care are all important considerations for a successful outcome.

References