Hernia repair under local or intravenous Ketamine in a tropical low socio-economic population

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Summary

Background: **All over the world hernia surgery constitutes a significant portion of the operations performed by a general surgeon. Operations for hernias ideally should be within the purview of secondary health centres thus allowing the tertiary health centres to focus on research and/or manage unusual or difficult presentations of diseases.**

Study design: **This prospective study reviews the management of hernias in the Catholic hospital Oluyoro in Ibadan by recording the demographic data, hernia characteristics and operations performed on 98 paediatric and 171 adult hernia patients who presented to the hospital between April 1996 and October 1998 with the use of intravenous Ketamine or local infiltration with xylocaine.**

Results: **In a 30-month period from April 1996 to October 1998, the author operated on 98 paediatric and 171 adult hernia patients. There were no paediatric mortalities but there was 1 adult mortality.**

Conclusion: **This paper shows that hernia operations in paediatric and adult patients can be safely done under intravenous Ketamine or local infiltration with xylocaine injection in a secondary care health institution.**

Key-words: ***Hernia surgery, General hospital experience.***

Résumé

Introduction: Dans le monde, l'intervention chirurgicale d'hernie constitue une partie importante d'intervention chirurgicale opérée par un chirurgien général. Dans l'iideal, l'intervention chirurgicale d'hernie devrait être dans les compétences de centre de la senté secondaire ce qui permet aux centres de la santé tertaire de concentrer dans des recherche et/ou traiter des présentations des maladies difficiles ou peu ordinaire.

Plan d'étude: Cette étude en perspective fait le bilan de la prise en charge d'hernie dans le centre hospitalier du catholique, Oluyoro à Ibadan tout en notant les données démographiques, les traits d'hernie et l'intervention chirurgicale opérée chez 98 pédiatrics et 171 patients adultes atteints d'hernie qui s'etainet presentes à h'hopital entre avrip 1996 et octobre 1998 avec l'utilisation de la ketaminine intraveineuse ou infiltration locale avec xylocaine.

Résultats: Dans une période de trente mois, d'avril 1996 en octobre 1996, l'auteur a effectué l'intervention chirurgicale chez 98 pédiatrics et 171 adultes atteints d'hernie. Il n'y avait aucun cas de mortalité pédiatrique mais il y avait la mortalité d'un adulte.

Conclusion: Cet article demontre que des intervention chirurgicales d'hernie dans pédiatrique et chez des adultes atteints d'hernie peut être effectuer sans danger sous la katamine intraveineux ou infiltration locale avec l'injection xylocaine dans institution des soins de la santé secondaire.

Introduction

Hernias have been estimated at accounting for 20-30% of patients presenting to a surgeon in a general hospital in the western part of Nigeria[1]. The ideal treatment should be safe and early so that complications of incarceration and strangulation can be avoided[2]. Not all patients can or should be referred to tertiary centres for hernia operations. The onus of good surgery and safe anaesthesia for hernia patients therefore rests on the surgeon in the general hospital. Full-time anaesthesiologists are usually not employed in this type of centre thus inexpensive and safe means of anaesthesia had to be provided for the many hernia patients who present to such centres[3]. Safe anaesthesia for hernia operations has been achieved with the use of local anaesthesia for elective surgery in adults and intravenous Ketamine for emergency surgery in all age-groups and elective surgery in children[4]. This paper presents the experience of a sole surgeon in a general hospital setting with hernias over a 30-month period.

Materials and methods

This is a prospective study of 98 paediatric and 171 adult hernia patients who presented to the Catholic Hospital Oluyoro in Ibadan from April 1996 to October 1998, a period of 30 months.

The hospital is a 200-bedded one that caters for the indigenes of Ibadan and its environs. It has three functional operating theatres.

Demographic data e.g. name, sex, age and address were recorded. Also recorded were anatomical data e.g. type of hernia, site, state (whether reducible, obstructed or strangulated) and the type of operation performed.

All the patients for elective surgery were admitted a day

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before surgery to ensure fitness and exclusion of intercurrent illnesses e.g. malaria, chest infections (especially in the children). Ancillary investigations in those fit for surgery were limited to packed cell volume and urinalysis for glucose.

All the patients had intravenous lines set up, the children had intravenous Ketamine 2mg/kg as bolus after premedication with intravenous atropine 10-20mcg/kg (maximum dose of 0.6mg) and diazepam 0.2mg/kg. Most of the children had 50mg of Ketamine overall, only a few (less than 5) had to have an additional top-up with 25mg. The adult patients who required intravenous Ketamine were those who presented with obstructed hernias, bilateral hernias and femoral hernias. Apart from premedication with atropine and diazepam they had intravenous pentazocine 30mg statim before surgery commenced. The adults for elective hernia repair had infiltration with xylocaine injection diluted to 0.5%. For those with inguinal hernia repair at least 60ml of 0.5% xylocaine was used to ensure adequate anaesthesia of the field of surgery. The dilution was accomplished by withdrawing 15ml of 2% and diluting with 45ml of water for injection. The technique of infiltration was to inject about 10ml 2cm medial to the anterior superior iliac spine for the ilio-inguinal nerve, 10ml lateral to the pubic tubercle for the ilio-hypogastric nerve, 5ml 4cm above the mid-inguinal point to anaesthetize the neck of the sac at the deep inguinal ring while the remaining 35ml was utilized as follows: 10 ml along the line of the proposed transverse skin-crease incision, 10 ml along the line of the inguinal ligament leading from the most lateral part of the proposed skin-crease incision towards the root of the penis,10ml injected subcutaneously fanning out from the midpoint of the incision line towards the external inguinal ring while keeping the last 5ml for direct infiltration at the neck of the sac if needed during dissection.

All the patients had skin-crease (transverse) groin incisions. The children had simple herniotomy and subcuticular skin-closure with 3-0 chromic catgut whilst the adults with inguinal hernia had Bassini repair with interrupted number 1 nylon stitches and skin closure with interrupted 2-0 nylon stitches. Those adults with femoral hernias had repair through the low approach with closure of the femoral canal by approximating the inguinal ligament over the canal to the fascia over pectineus muscle with 2 or 3 interrupted number 1 nylon stitches.

All the patients except those who had intestinal resection were discharged on the day after surgery and were seen after one week at the out-patients clinic.

Results

The total number of general surgical operations (both major and minor) performed during the period of the study was 764 with 269 being hernia cases (both adult and paediatric), comprising 35.2%.

Paediatric patients (0-15 years)

Total number of patients 98 ; 92 males and 6 females. M : F ratio 15 : 1.

Age range : 2 months to 15 years. Mean age 5.1 years. Mode 1.5 years.

All the hernias were inguinoscrotal in males and inguinolabial in females.

Sidedness: Right-sided hernias 64 (65.3%); male 61, female 3.

Left-sided hernias 29 (29.6%); male 27, female 2.

Bilateral hernias 6 (6.1%); male 5, female 1.

Ninety-five cases were elective operations, 3 cases (3%) were emergencies for obstruction. There was no strangulated bowel, however there was an infarcted testis in the 2 month old infant. He had a left orchidectomy apart from his herniotomy. Associated operations apart from the 98 herniotomies included the orchidectomy mentioned above, and 4 orchidopexies for undescended testes (2 right-sided and 2 left-sided).

Complications

Five patients reacted to the Ketamine with sudden apnoea. They were managed successfully with parenteral adrenaline and ambu-bagging until the acute episode resolved.

There was a recurrent hernia one-month after surgery in one of the children that reacted to Ketamine.

There was no mortality.

Adult patients

Total number 171; 146 male and 25 female. Age range 16 to 90 years. Mean age was 47.6 years. Male/Female ratio was roughly 6 : 1.

Total groin hernias 157.(92% of total adult hernias in the study). There were 11 direct (7%), 144 indirect (91.7%) and two femoral hernias (1.3%).

Sidedness:

Right-sided; 93 patients : 88 male and 5 female. (59.2%).

Left-sided; 58 patients : 50 male and 8 female. (37%).

Bilateral; 6 patients : 3 male and 3 female. (3.8%).

Non-groin hernias ;14 patients, 9 female and 5 male (8% of total), made up of two umbilical , one infraumbilical, one supraumbilical, six epigastric, two incisional and two lumbar hernias.

Obstructed cases

Seventeen cases presented as emergencies, 6 of these had evidence of strangulation. There were 7 cases of obstructed right inguinoscrotal hernia of which 3 had strangulated bowel, 3 had the appendix trapped in the sac (two acutely inflamed and one uninflamed), and one simple obstruction. The obstructed left inguinoscrotal hernias were 6 in number with 2 showing strangulated bowel and 4 with simple obstruction. Two cases of femoral hernia had only one being strangulated. There was one case of obstructed epigastric hernia with infarcted omentum as its content. Lastly there was a strangulated right lumbar hernia.

Associated procedures performed

Apart from Bassini repair, resection and end to end anastomosis for infarcted bowel, omentectomy, appendicectomy, simple repair of anterior abdominal wall hernia, femoral hernia repair, lumbar hernia repair were performed.

Complications

Wound infection in the 2 patients with acute appendicitis within their hernial sacs.

No recurrence was reported during the period of this study in the adults.

There was one mortality, a 59-year old man with strangulated right lumbar hernia. He died 24-hours post operatively of septic shock.

Discussion

The percentage of hernia operations was 35.2%, this means that over a third of theatre sessions will involve one form of hernia surgery or the other with groin hernias taking more than 90% of such cases[1,2,3]. From the number recorded in this study we were operating on about 9 cases a month.

Ketamine, an intravenous anaesthetic which is hardly used in teaching hospitals is the mainstay of many major operations in most general hospitals[4,5,6,7].In this study we operated on 98 children using intravenous Ketamine with 5 children reacting to it. Whilst it is a very useful drug one should be aware of the dangerous adverse effects like sudden prolonged apnoea[6,7]. This apnoea is only a cessation of breathing without stoppage of the heart, however if this is not recognized quickly the heart may eventually stop because of hypoxia and there may be hypoxic brain damage if eventually the patient is resuscitated[7]. Fortunately these disasters can be averted if one is aware of this complication and remedial measures are quickly instituted[6,7]. The fact that the drug is short-acting also helps in the supportive management of those who may have this reaction as resolution occurred within 30 minutes after subcutaneous adrenaline and Ambu-bagging were commenced in the patients who reacted.

Our anatomical findings tally with many publications in the finding of a predominance of right-sided groin hernias, 65.3% and 59.3% in paediatric and adult patients respectively[2,3,4,8,9,10]. The explanation has been the later descent of the right testis rendering it prone to development of a hernia[8].

The obstruction rate in children was 3% while in adults it was 10%, other studies have shown rates of 7.3%, 4.8% and 22.4% in neonates, children and adults over 50 years respectively[10,11,12].

Hernias are still predominantly male-oriented diseases as the male : female ratios in this study are overwhelmingly in favour of the male child at 15 to 1 thereafter reducing to a still impressive 6 to 1 in adulthood. Other studies have quoted even more impressive figures of 20 –25 to 1[8]. This study also disclosed a bilaterality-rate of 10%[8], in this study the incidence of bilateral herniae was 6.1% in children and 3.8% in adults. The occasional finding of the vermiform appendix in a hernia sac has been documented; the incidence is about 1% of all cases of right inguinoscrotal hernia[13,14,15]. Appendicectomy with hernial repair at the same sitting should be the preferred procedure whether the appendix is inflamed or not[13,14,15,16].

Ketamine anaesthesia was the agent that absolutely facilitated surgery in the paediatric patients, adults with bilateral hernia and obstructed herniae[2,3,4,5,6]. It is said to preserve the gag and swallowing reflexes thus reducing the chances of the patient aspirating during surgery[2]. The increase in muscle tone and hallucinations that it causes are ameliorated by premedication with intravenous diazepam[4,5,6]. Idiosyncratic reactions like sudden apnoea may occur and should be watched out for[6,7]. About 5% of the children had this reaction, fortunately remedial actions were taken and no fatalities recorded.

Bassini repair was performed in all the adults with inguinal herniae because it is simple and quick to perform[5,8]. Pre-operative sedation and the method of local infiltration[10] which is standard practice ensured that both patient and surgeon were comfortable throughout the operation. We kept the total amount of 0.5% xylocaine to 60ml which is safe, other authors have used up to100ml of 0.5% xylocaine without adverse effects[8,17]. The 6 patients who had bilateral herniae had their operations under intravenous Ketamine in order not to exceed the safety limit of 0.5% xylocaine as one would have had to use double of the 60ml which one side usually consumes. Recurrence rates with this form of repair have been quoted at about 5-10% within 5 years however the authors still recognize it as a safe and reliable method of repair[8,10,18]. There were no recurrences in this study probably because the period of the study (30 months) was not long enough for adequate follow-up. Immediate complications were limited to wound infection in only 2 patients and the only mortality was a man who died 24 hours after resection and anastomosis of infarcted gut trapped in a right lumbar hernia. The patient had been obstructed for 5 days before presentation being managed as pyomyositis of the right flank in the referral hospital. It was likely that he died of multiple organ failure consequent upon gram-negative endotoxic shock. Lumbar hernias are usually grouped into two types, the superior or Grynfeltt's and the inferior or Petit's hernia. The more common type is the Grynfeltt's of which the incidence of strangulation is approximately 10%[19].The paucity of investigatory modalities limited the investigations to urinalysis and packed cell volume after full physical examination has suggested that the patient is fit for a hernia operation. This state of affairs, though not ideal, underscores the peculiarities of experience in a general hospital in a low socio-economic setting.

In conclusion, hernia surgery in a general hospital setting can be safely performed with the judicious use of intravenous Ketamine in children and emergency adult surgery as long as awareness of its side-effects and subsequent remedial measures are taken.

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