



Inguinal Hernia Repairs in a Rural Setting in East Africa

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Background: Inguinal hernias are a major cause of morbidity and mortality in the developing world. In resource limited settings in rural Africa the clinical management of inguinal hernias may pose a therapeutic challenge to the surgeon due to the late presentation of this condition and lack of availability and affordability of mesh and laparoscopy. In our environment there is a lack of data and literature regarding the surgical management of inguinal hernias. The purpose of this study was to outline the clinical profile and outcomes among patients undergoing inguinal hernia repairs in our hospital.

Methods: A descriptive retrospective study was carried out between 1st April 2008 to the 31st July 2012 on all patients ≥ 15 years of age that underwent an inguinal hernia repair were eligible in this study. The patients were reviewed on the surgical ward postoperatively and in the surgical out-patients clinic 3 months post-operatively. Data was collected using a pretested questionnaire on the following variables: age, sex, recurrence of hernia, post-operative pain and post-operative complications. Physical examination was used to determine post-operative recurrence and evidence of haematomas, seromas or severe wound sepsis requiring operative intervention.

Results: One hundred and fifty eight patients following repair of inguinal hernia using the Modified Bassini technique were analyzed. Mean age was 44.84 years. The male:female ratio was 3.65:1 with male predominance. Emergency inguinal hernia repairs were carried out in 4(2.53%) and the

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majority of patients, 154(97.47%) were elective inguinal hernia repairs. One(0.63%) mortality and the morbidity included 1(0.63%) seroma, 1(0.63%) haematoma, 1(0.63%) necrotizing fasciitis and 1(0.63%) enterocutaneous fistula. The overall complication rate was 3.16%.

Conclusions: In rural Africa patients with inguinal hernias should be encouraged to present early with signs and symptoms of inguinal hernia. Elective hernia repair of inguinal hernias, irrespective of the type of repair, will reduce the morbidity and mortality from this common problem in East Africa.

Keywords: Inguinal hernia; rural; East Africa; post-operative; morbidity; mortality.

ABBREVIATIONS

ASA: American Society of Anesthesiologists score

1. INTRODUCTION

Globally, approximately 75% of abdominal wall hernias are due to an inguinal hernia [1-6]. This type of hernia is therefore the commonest type of hernia and its repair tends to be amongst one of the most common surgical procedures worldwide [7-9]. The rate of operations for inguinal hernias varies between countries around the world from 100-300 per 100,000 populations per year [10].

In the United Kingdom 100,000 inguinal hernias are repaired annually [10]. However in Africa the incidence of inguinal hernia is 175 per 100,000 population annually [11] with only less than 40% having a repair resulting in many patients developing inguinoscrotal hernias which are longstanding and have an associated high mortality and morbidity. In the Department of Surgery at St. Joseph's Maracha Hospital a rural Missionary Hospital in Northern Uganda the commonest indication for admission to the General Surgery wards is for inguinal hernia.

The life time prevalence of inguinal hernia is 3% in women and 27% in men and this tend to drop after 45 years of age [7,12]. Two thirds of recurrent inguinal hernias are direct and two thirds of inguinal hernias are indirect [12]. There is a 10% incidence of incarceration and a smaller proportion of inguinal hernias may become strangulated. The recurrence rate following adult inguinal hernia repair varies according to the method of repair however the recurrence rate in children is less than 1% [12,13].

In 1887, the original description of inguinal hernia was published by Bassini. Over the last few decades other techniques for hernia repair such as the modified Bassini repair, Desarda, Shouldice, Lichtenstein mesh repair and recently

laparoscopic mesh repair have become more popular [14]. These repairs are associated with a low recurrence rate and a rapid return to normal activities [15]. In many centers in low income countries due to the non-availability and non-affordability of laparoscopy and mesh and poor socio-economic status these inguinal hernia techniques are not popular. Therefore in East Africa, traditional suturing techniques such as Modified Bassini repairs, Desarda and Shouldice repairs are still routinely performed [16].

In resource limited settings in rural Africa the clinical management of inguinal hernias may pose a therapeutic challenge to the surgeon due to the late presentation of this condition and lack of availability and affordability of mesh and laparoscopy [11,17]. The delayed presentation with large inguinoscrotal hernias and the need for emergency surgery due to complications such as incarceration or strangulation is commonly seen in our setting. In Sub-Saharan Africa, emergency repair of inguinal hernias accounts for approximately 65%. The mortality among those that do not reach hospital is 87% and the rate of bowel resection is 24% [16-18]. The morbidity and mortality due to this common problem can be reduced and eliminated with an early presentation and carrying out an early repair of these inguinal hernias [18].

In our environment there is a lack of literature regarding the surgical management and outcomes of inguinal hernia repairs. The purpose of this study was to outline the clinical profile and outcomes among patients undergoing inguinal hernia repair in our hospital.

2. METHODOLOGY

This was a descriptive retrospective study of patients that were operated for inguinal hernias at St. Joseph's Maracha Hospital between 1st April 2008 to the 31st July 2012. St. Joseph's Maracha Hospital is a 204 bed capacity Missionary Hospital with an attendance of 16,626

outpatients and 6,145 patients annually. All patients were ≥15 years of age and consented for a Modified Bassini repair as part of the routine standard clinical management in the hospital.

Over this period no mesh repairs or other types of repair were performed. Inclusion criteria included all patients undergoing an inguinal hernia repair. We excluded patients with non-inguinal hernias and femoral hernias. According to the preference of the operating surgeon antibiotics were given. Most patients received antibiotic prophylaxis and the majority of patients received one dose of intravenous amoxicillin.

The patients were reviewed in the Surgical ward and informed consent was obtained and eventually they were followed up at the Surgical Out-Patients clinic at 3 months post-operatively. Data was collected using a pretested close ended questionnaire from the patients' clinical files and the patients on the following variables: age, sex, recurrence of hernia, post-operative pain and post-operative complications. Physical examination in the ward post-operatively and in the Surgical Out-Patient clinic was used to determine post-operative recurrence and evidence of haematomas, seromas or severe wound sepsis. Only major complications requiring further operative intervention were included in the morbidity profile in this study.

3. RESULTS

One hundred and fifty eight patients presented with an inguinal hernia between 1st April 2008 and 31st July 2012 and all patients had a Modified Bassini repair. Mean age was 44.84 years. The male: female ratio was 3.65:1 with hernias occurring mostly in male patients (Table 1).

Table 1. Demographics of patients presenting with inguinal hernia

Age	
Range of age	15 – 86 years
Mean age	44.84 years
Sex	
Male patients	124
Female patients	34
M:F ratio	3.65:1

Table 2 shows the clinical characteristics of the patients with inguinal hernias. The majority of

patients had right sided inguinal hernias 103(65.19%) whilst only 47(29.75%) presented with a left sided inguinal hernia. Two (1.27%) patients presented with recurrent inguinal hernia whilst 20(12.66%) patients presented with inguinoscrotal hernias.

Emergency inguinal hernia repairs were carried out in 4(2.53%) and the majority of patients, 154(97.47%) were elective inguinal hernia repairs (Table 2).

Table 2. Clinical characteristics of patients with Inguinal Hernia

Right sided Inguinal Hernia	103
Left sided Inguinal Hernia	47
Bilateral Inguinal Hernia	8
Recurrent Inguinal Hernia	2
Inguino-scrotal Hernia	20
Elective hernia repairs	154
Emergency hernia repairs	4

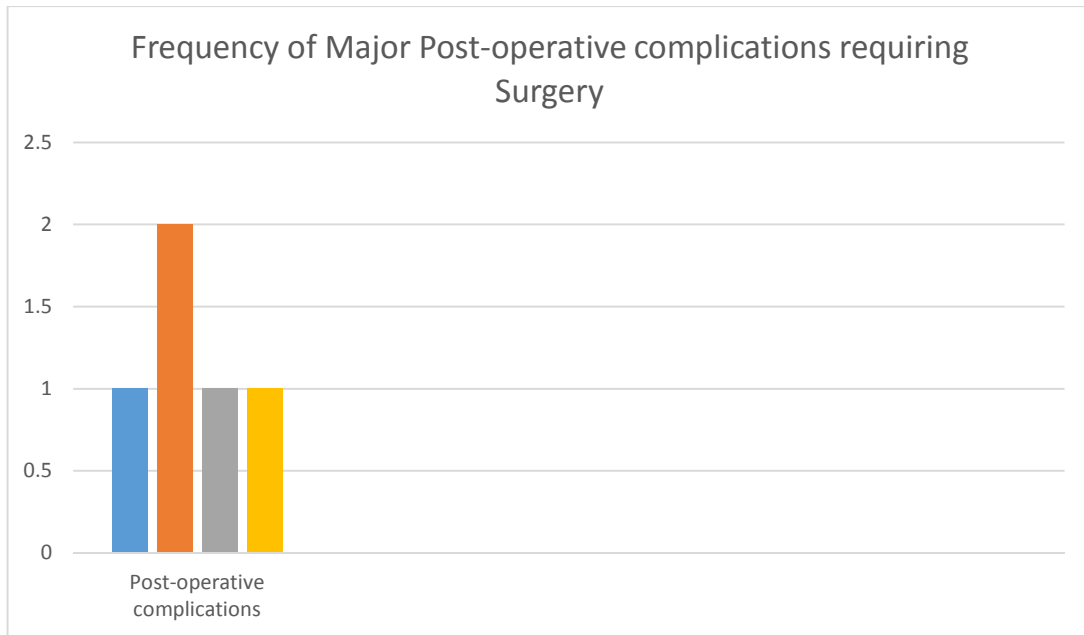
Table 3. Post-operative complications following Inguinal Hernia Surgery

Type of complication	Number of procedures
Seroma	1
Haematomas	2
Necrotizing fasciitis	1
Enterocutaneous fistula	1
Total	5 (3.16%)

There was one (0.63%) death amongst our patients. This was due to a complication following extensive debidement for necrotizing fasciitis. The frequency post-operative complications (Bar graph 1) reported included 1 seroma that required surgical drainage; 1 haematoma that required surgical drainage; 1 necrotizing fasciitis in a diabetic patient and one patient that developed an enterocutaneous fistula (Table 3).

Four (2.53%) of patients presented late needing emergency surgery. Two(50%) developed complications of which one developed necrotizing fasciitis and the other developed an enterocutaneous fistula. Out of 154(97.47%) of elective inguinal hernia repairs, that presented early two (1.29%) developed complications.

Twenty two (13.92%) of patients developed post-herniorrhaphy pain/discomfort >3 months however it was not a major complication requiring further operative intervention.



Graph 1. Showing the frequency of major post-operative complications requiring surgery
Legend: Blue: Seroma; Brown: Haematomas; Grey: Necrotizing fasciitis; Yellow: Enterocutaneous fistula

4. DISCUSSION

A significant proportion of the surgical workload in many centres comprises inguinal hernia repair which is a commonly performed general surgery procedure [7,19,20]. In a General Surgery unit, inguinal hernia has been found to constitute approximately 10-15% of all surgical procedures [7,9]. Inguinal hernia repair constituted 18.7% of all the adult general surgery procedures in our study. This is a higher rate than 12.5% reported in Nigeria by Garba et al. (Garba et al., 2000).

The mean age of 44.84 years was similar to other studies which showed a lower incidence [21] however in contrast to other reported studies which have reported a high age incidence [22,23]. The reason for this age difference is unknown. However in this age group the high incidence of this condition has a negative economic impact in the country given that this is the economically productive age group.

Inguinal hernias are reported as being 20 times more common in males than in females [24]. Our study showed a lower male predominance of 3.65:1 possible due to the small sample size. Whilst the reason or male predominance is not known it is postulated that male patients are involved in more strenuous work and this is responsible for the development of these

hernias. Men have twice the risk of developing an inguinal hernia with a diagnosed hiatal hernia. Women with a chronic cough, taller height and in a rural residence have a higher incidence of inguinal hernia. A higher risk of inguinal hernia is seen in men of normal weight compared to obese men [25,26].

In agreement with similar observations from other studies inguinal hernias are more common on the right side [27-29]. In our study the ratio of right inguinal hernia to left inguinal hernia was 2.19:1. The higher failure of closure of the processus vaginalis and the later descent of the right testicle are factors responsible for predominance of this condition on the right side [24,27]. Compared to other low income countries, our population in the rural part of East Africa presents in a similar way clinically [27,30]. Financial constraints and lack of awareness result in a substantial number of patients presenting late with a giant inguinoscrotal hernia [31,32]. In our study 12.66% of patients presented late with a large inguinoscrotal hernia and a few presented for the first time as an emergency with incarcerated or strangulated hernias which are associated with a higher morbidity and mortality.

The diagnosis in all our cases of inguinal hernia was made clinically. The clinical use of

ultrasound in the groin which has shown to be beneficial in cases where the diagnosis is uncertain. The specificity of ultrasound in detecting inguinal hernias is 82% and the sensitivity is 90% [33,34].

In our study all patients were managed by open herniorrhaphy and the Modified Bassini repair was the method of choice. Over 60% of the inguinal hernias in our study were operated under local anaesthetic only despite the large size of many of the chronic hernias. This form of anaesthesia was tolerated well by the operating surgeons and the patients. All unilateral hernias regardless of size were repaired under local anaesthesia whilst bilateral hernias were operated under spinal anaesthesia. Local anaesthesia and spinal anaesthesia reduces the risks associated with general anaesthesia. In our setting this has advantages as general anaesthesia is performed by non-specialists and local anaesthesia may also allow for day case surgery. Other advantages include the low cost to undertake the procedure and also the early recovery of patients undergoing inguinal hernia repair [35].

In our study the rate of post-operative complications needing surgery was low. The patients were followed up until 3 months after surgery however many could have been lost to follow up after this time period. Whilst a lack of follow up is a problem in many parts of rural Africa we can assume that it is unlikely that significant serious complications requiring surgical intervention have been missed. In this study the low complication rate of 3.16% is comparable to findings from other studies which have been found to range between 4.2% to 12% [3,4].

There was a higher complication rate registered with emergency inguinal herniorrhaphy compared to elective inguinal herniorrhaphy. The higher complication rate in emergency herniorrhaphy was due to many of these patients presenting with complications such as incarceration and strangulation which also needed bowel resection due to gangrenous bowel. In the literature the overall mortality rate from inguinal hernia repair ranges from 1% to 14% [28,3]. In the present study the mortality rate of 0.63% is lower than the mortality rate reported by Mbah et al., at 5.3%, Mabula et al. at 9.7% and Alvarez t al., at 3.4% [29,30,5]. In this study the low mortality rate was primarily due to the

majority of inguinal hernia repairs performed electively.

The only mortality registered in this study was a diabetic elderly patient admitted with a strangulated inguinal hernia needing a bowel resection for gangrenous 20cm of terminal ileum involving the caecum. The patient eventually developed necrotizing fasciitis and underwent an extensive debridement of the abdominal wall however eventually died four days post-operatively. Studies have shown that factors associated with a high mortality are the presence of comorbidities, high ASA score, longer duration of symptoms, delayed operative intervention, the need for bowel resection and the presence of postoperative complications [29].

Chronic groin pain has been reported in Western literature to vary between 0% to 54% after open and laparoscopic mesh herniorrhaphy however our study showed that the incidence of this complication was low at 14% [19,36]. Although all inguinal hernias in our study had a modified Bassini repair which is a tension repair, the incidence of chronic groin pain was lower than reported in many studies in high income countries. This may possibly be due to technical reasons which require further investigation.

5. CONCLUSIONS

In our hospital in rural Africa inguinal hernia repairs are carried out safely with a low morbidity and mortality. The majority of patients were operated as an elective repair as they presented early to hospital hence the good outcomes following surgery. In rural Africa patients with inguinal hernias should be encouraged to present early with signs and symptoms of inguinal hernia. Elective repair of inguinal hernias, irrespective of the type of repair, will reduce the morbidity and mortality from this common problem in East Africa.

CONSENT

The author declares that written informed consent was obtained from all the patients that underwent hernia procedures in this study.

ETHICAL APPROVAL

As per international standard and University standard ethical approval has been collected and preserved by the author.

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COMPETING INTERESTS

The author has declared that no competing interests exist.

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