

Open Inguinal Hernia Repair: Our Experience with Tertiary Institution-Based Surgical Outreach

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Abstract

Background: Inguinal hernia afflicts the low socioeconomic class mostly in resource-poor settings. The surgical outreach option greatly reduces this burden. Tertiary health institutions will be a good base for surgical outreaches in hernia repairs. **Aim:** The aim of this study was to determine the outcome of using a tertiary health-care facility for a surgical outreach program. **Methods:** This was a prospective clinical study conducted among 195 patients who underwent open groin hernia repair in Alex-Ekwueme Federal University Teaching hospital Abakaliki. Data were collected from admission, till discharge from hospital, and up to 3 months follow-up after the surgery. **Results:** Out of 206 recruited, a total of 195 patients underwent open groin hernia repair with a male: female ratio of 6.5:1. Their age ranged from 0 to 88 years with a mean age of 33.94 ± 23.40 years. Among the patients, 69.2% of the hernias occurred in ages below 50 years, 58.4% had right, 38% left and 3.6% had bilateral hernias. Open hernia repair was performed in 63.1% and herniotomy in 36.9%. In those that had an open hernia repair, majority 91.8% had tissue repair, whereas 8.2% had mesh repair. Postoperative complication rate was 9.2%. **Conclusion:** Surgical outreach in a tertiary health facility offers standard care with skilled surgical personnel offering a better outcome with complication rate similar to what obtains in a conventional tertiary health care. Tertiary hospitals where available should be preferred in the surgical outreach for hernias in a low-resource setting.

Keywords: Low-resource setting, Nigeria, open hernia repair, surgical outreach, tertiary health-care facility

INTRODUCTION

Hernia repair was first formally described in the 15th century.^[1] Until then, nonrepair procedure like orchidectomy with hernia sac debridement and eventual healing by secondary intention was the practice.^[1] Since then several millions of hernia repairs are performed per year globally.^[2-4] The value is estimated to be 175 per 100,000 per annum.^[2,3] In many communities across Africa, there are accumulated number of untreated inguinal hernias that have been overlooked, mostly due to the lack of funds to access care or ignorance of the pathology.^[3] This could result to diverse complications and their consequences especially when very vital structures are part of the contents. Unusual contents like ovary, fallopian tube, bladder, and even appendix seldom inflamed have been reported.^[5] These findings may in addition to requiring urgent attention affect the outcome and the treatment protocols.

In treatment of inguinal hernias, reinforcing the posterior wall has been acknowledged, and this has progressed to a proven evidence that placement of a mesh reduces the recurrence.^[6,7] In Africa where the hernia burden is very high, the most appropriate repair technique is yet to be decided due to the lack of documented data.^[2,3] Many patients in Africa do not have access to safe elective surgery. Those who have access to elective surgery mostly have tissue repairs due to

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the relative high cost of mesh or even lack of mesh.^[8] Data in the literature have shown that tissue repair is more common in Africa, and this has remained the same for the decades.^[9-11] The most common method of repair is Bassini repair which is far more in use than Nylon Darn and Mac Vay in Africa.^[3] Although the trend in hernia repair progressed, tissue repair persists in Africa due mainly to poverty. This is a major reason why surgical outreach options have helped immensely in reducing the hernia disease burden. Most of such outreaches are done in make shift facilities with some complications. This study evaluates our experience with 195 patients who underwent open hernia repair over a 1-week period at a tertiary hospital in South-eastern Nigeria in an outreach setting. The use of a tertiary institution for surgical care represents a paradigm shift from the traditional approach to surgical outreach.

METHODS

The T Y Danjuma foundation is a charitable organization that works in Nigeria to assist less privileged to assess medical treatment both surgical and nonsurgical pathologies. This was a prospective clinical study conducted on 206 patients of which 11 patients declined consent. The patients with uncomplicated hernias and controlled systemic disease who or their relatives gave consent to surgery, and publications were involved in the study. The program took place in the department of surgery, Alex-Ekwueme Federal University Teaching Hospital Abakaliki, Ebonyi State Nigeria, from June 7, 2018, to June 14, 2018 under this foundation.

Patients with complicated hernias, uncontrolled comorbidity or who failed to give consents were excluded. In each day of the surgery, patients were admitted on the morning of the surgery into surgical ward. They were thoroughly evaluated for fitness using basic investigations (full blood count, urinalysis, random blood sugar, chest X-rays, and electrocardiogram). Each investigation is chosen based on patients' clinical findings. Those found fit were enrolled into the study. Anesthesia ranged from general, regional to local anesthesia. Prophylactic antibiotic (cephalosporin) was given at induction of anesthesia or before infiltration of local anesthesia.

Children below 12 years had herniotomies alone, children between 12 and 18 years had either herniotomy with narrowing of the deep ring (with vicryl 2/0 suture) or herniorrhaphy if the posterior wall is weak. All the adults had either tissue repair with posterior wall re-enforcement or tension-free repair with mesh (hernioplasty). The indications for mesh repair were recurrent hernias and hernias with posterior wall defect adjudged to be very weak. At the end of the surgery, patients were discharged home on the same day (day-care surgery) or admitted for further care depending on postoperative clinical condition influenced mainly by associated complication. All admitted patients were discharged within 3 days of their surgeries. Postoperatively, patients were placed on analgesics and antibiotics extended for those with complications and for

those that had mesh repair. Following discharge patients were followed up in the outpatient clinic for a period of 3 months.

RESULTS

Out of 206 recruited, a total of 195 patients met the criteria and underwent open inguinal hernia repair. The age group distribution of cases ranged from 0 to 88 years with a mean age of 33.94 ± 23.40 years [Tables 1 and 2]. The male to female ratio was 6.5:1 [Table 2]. This study shows that inguinal hernias are more common in uneducated, married men who majorly resided in the rural areas [Table 2]. Two-peak age incidence were noted, one in childhood and another increase in the incidence after 20 years [Table 1]. It was also observed that among the patients, 69.2% of the hernias occurred in ages below 50 years, whereas 30.8% occurred in those above 50 years

Table 1: Age group distribution of patients with inguinal hernia

Age group (years)	Frequency (%)
0–9	50 (25.64)
10–19	17 (8.72)
20–29	20 (10.26)
30–39	22 (11.28)
40–49	25 (12.82)
50–59	34 (17.44)
60–69	15 (7.69)
70–79	11 (5.64)
80–89	1 (0.51)
Total	195 (100)

Mean 33.93 ± 23.40 SD. SD: Standard deviation

Table 2: Sociodemographic features of the participants (n=195)

Variables	Frequency/percentage, n (%)
Age (years), mean	33.94 ± 23.40
Gender	
Male	169 (86.7)
Female	26 (13.3)
Marital status	
Single	96 (49.2)
Married	97 (49.7)
Divorced	2 (1.1)
Place of residence	
Urban	30 (15.4)
Rural	165 (84.6)
Educational level	
Nil	90 (46.2)
Primary	65 (33.3)
Secondary	21 (10.8)
Tertiary	19 (9.7)
Previous surgery	
Yes	15 (7.7)
No	180 (92.3)

of age [Table 1]. Among patients with inguinal hernias, it was noted that 58.4% of them had right sided hernia, 38% had left sided while 3.6% had bilateral hernias [Figure 1]. More patients were operated under local anesthesia and all patients had prophylactic antibiotics, with 83.1% receiving postoperative analgesia [Table 2]. During the surgery, herniating contents were examined, and the following were noted; small bowel: 38.5%, appendix: 3.1%, omentum: 10.8%, preperitoneal fat: 3.6% and caecum in 0.5% [Figure 2]. Nylon Darn technique was majorly used accounting for 78.9% of tissue repairs.

Open hernia repair was performed in 63.1% of patients, whereas 36.9% had herniotomy [Table 3]. In those that had open hernia repair, open hernioplasty (repair with mesh) was done in 7.3%, whereas tissue repair was done in 92.7% [Table 3].

Postoperative complications were noted in 9.2% of patients, with scrotal oedema and hematoma being the highest 3.1% [Table 4].

DISCUSSION

Inguinal hernias are prevalent in developing countries including Nigeria. They afflict mainly the males probably due to the level of strenuous activity which they embark on.^[2-4,12,13] In our study also, a male predominance was also observed with a male-to-female ratio of 6.5:1. The mean age was 33.94 ± 23.40 years while the peaks were 0–9 years and 40–59 years which are in keeping with a published report in the sub-region which showed two periods being 5–15 years and above 20 years.^[3] We also found that hernia increases with age in this study. This is consistent with the known fact that hernias tend to increase after 16–24 years.^[13] The peak age in adults of approximately 40–59 years from our study represents an active workforce in our environment. The hernia affliction if left untreated would eventually affect economic productivity in our environment where males are still considered the bread winners. It therefore necessitates prompt intervention.

Our patients were also commonly rural dwellers who mostly engage in farming activities. This level of strenuous activities would contribute to their developing inguinal hernia disease.^[14] Being peasant farmers, they were also unable to access care

in the established medical centres. Other factors such as poor educational level and other features of low socioeconomic indices were elucidated which are consistent with other published reports.^[13-15]

Table 3: Peri-operative findings

Variables	Frequency, n (%)
Anaesthesia	
General	70 (35.9)
Regional	40 (20.5)
Local	85 (43.6)
Intraoperative medications	
Prophylactic antibiotics	195 (100)
Analgesia	162 (83.1)
Type of surgery (n=195)	
Herniorrhaphy	123 (63.1)
Herniotomy	72 (36.9)
Types of herniorrhaphy (n=123)	
Open tissue repair	114 (92.7)
Open mesh repair	9 (7.3)
Types of tissue repair (n=114)	
Bassini	22 (19.3)
Nylon darn	90 (78.9)
Others	2 (1.8)
Types of hernia seen (n=195)	
Direct	47 (24.1)
Indirect	147 (75.4)
Pantaloon	1 (0.5)

Table 4: Complications postsurgery (18 out of 195)

Variables	Frequency (%)
Scrotal edema	6 (3.1)
Haematoma	6 (3.1)
Wound infection	3 (1.5)
Scrotal excoriation	1 (0.5)
Postcatheterization urethritis	1 (0.5)
Postspinal anaesthesia headache	1 (0.5)

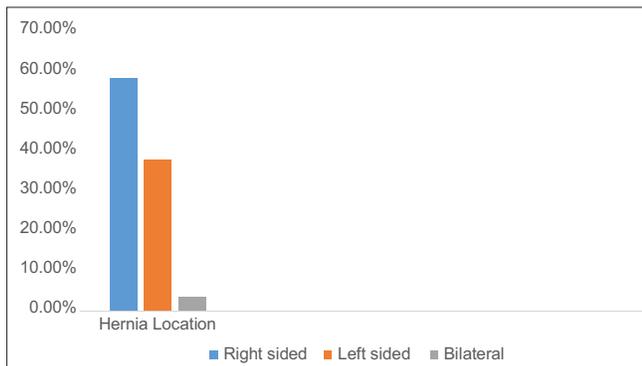


Figure 1: Horizontal: Hernia Location, Vertical: Percentage (%), (n = 195)

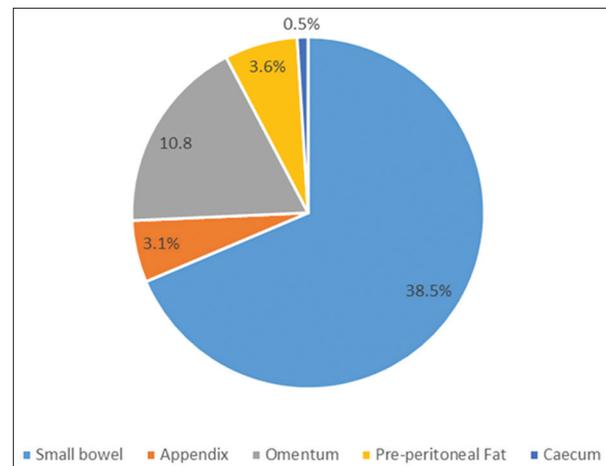


Figure 2: Hernia sac contents (n = 195)

In the present study, inguinal hernias are more common on the right when compared to left, with a ratio of 1.5:1. The anatomical explanation of this may be from delay in the obliteration of right processus vaginalis as right testis descends later than the left in life. This is similar with literature reports on right-sided inguinal hernia predominance.^[2,14,16]

Agbakwuru *et al.* and Ohene-Yeboah and Abantanga reported more cases of indirect inguinal hernia in their works when compared to direct and pantaloon hernias.^[3,4] In this study, more cases of the inguinal hernias were indirect type and correlates with the above studies.

Warwick *et al.* and O'Dwyer *et al.* in their works have stated that all forms of anaesthesia are safe for hernia repairs.^[8,17] In the present study, three forms of anesthesia were used, namely general, regional and local anesthesia. Greater number of patients (43.6%) was operated on with local anesthesia, and choice of anesthesia was guided by hernia size and age of patient, as complicated hernias were excluded. On the contrary, information from other African studies has shown increased use of general and spinal anesthesia for hernia repair.^[3] However, the present study has shown a progression from general/regional anesthesia to local anesthesia. General anesthesia in our study of mixed age group was mainly in children for obvious reason of noncompliance. Chen *et al.* showed that local anesthesia is cheaper, available, and safe in inguinal hernia repair.^[18] Therefore, it is a veritable option in the low socioeconomic population as ours when its indications are met.

Fall *et al.* and Adesunkanmi *et al.* have shown that in Africa tissue repair is more common and has remained the same, with Bassini technique of repair as the most common.^[9-11] In the present study, Nylon Darn technique was the most common technique of tissue repair (78.9%). Most surgeons were conversant with the technique which suits well to our setting in being cheap and available compared to use of mesh and having low recurrence.^[19] Olasehinde *et al.* in their work on a 5-year review of Darning technique of inguinal hernia repair have shown that Darning technique is a safe and effective method of inguinal hernia repair.^[19]

This technique could be used irrespective of the hernia sac contents. This study noted six patients (3.1%) with uncommon contents, and all were uninflamed appendices and did not influence the choice of repair nor outcome. Uncommon contents of inguinal hernial sac have been reported in the literature. Kidmas *et al.* in Jos, Nigeria reported two cases of inflamed vermiform appendices in inguinal hernia.^[5] Goyal *et al.* in their work on uncommon contents of inguinal hernial sac of 330 patients reported (1.5%) five uncommon contents (two vermiform appendices, an ovary, Fallopian tube, and urinary bladder).^[20]

We had a postoperative complication rate of 9.2% which is close to 7.79% observed by Ramyil *et al.* in Jos Nigeria.^[21] This being an outreach setting, with such complication rate and no mortality emphasizes the advantage of a tertiary institution

collaboration in surgical outreaches. The complications ranged from edema, scrotal hematoma to superficial wound infection. These were successfully managed conservatively with scrotal support, anti-inflammatory drugs, and antibiotics, where appropriate.

Limitations

Short duration of follow-up which limited assessment of other long-term complications such as hernia recurrence was a major limitation. Although high-volume study in terms of sample size and study duration, it is a one-center study and will need expansion.

CONCLUSION

Surgical outreach with operative care in a tertiary institution has the obvious advantage of providing a level of care at par with the conventional tertiary care outcomes. There is availability of adequate skilled manpower conversant with better options of repair. The nylon darning technique was mostly used in this outreach which is cheap and has low recurrence rate. There is also low complication rate which goes to emphasize the advantage of a tertiary hospital use as a base for surgery in outreaches. It is recommended that this collaboration be sustained to forestall untoward effects often encountered in surgical outreaches.

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Conflicts of interest

There are no conflicts of interest.

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