

Voluntary Hernia Aid Program in Rural Nigeria: Analysis of 152 Consecutive Patients with Effective Groin Hernia Repairs-A Retrospective Study

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Article History

Submitted: 24/05/2024; Accepted: 06/06/2024; Published: 23/06/2024

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ABSTRACT

Emergencies and treatment of surgical complications constitute the bulk of surgical activities in developing nations as against elective surgeries. A significant reduction in surgical disease burden is feasible in local communities using simple but effective options. An account is presented of such a service offered through an outreach program conducted over three months period among the rural populace of Southern Nigeria. We did a descriptive retrospective study of 152 consecutive patients who had elective repair of groin hernia between March – June 2019. Patients presented on their own volition in response to the publicity given to the outreach program by the local organizers. There were a total of 174 groin hernia repairs were done in 152 patients including 22 (14.5%) bilateral lesions. Inguinal hernia was by far the most common groin hernia constituting 171 (98.3%) against femoral hernia recorded only in 7 (4%). More males were affected by inguinal hernia than females but the reverse was the case for femoral hernia. Approximately three quarter of the patients harboured their symptoms for more than one year due to financial constraints in 71.3% of patients. However, in a medical outreach program, financial burden is removed. So in resource poor setting, elective hernia repair uptake is therefore enhances.

Keywords: Elective Surgery, Groin Hernia, Rural Nigeria, Voluntary

INTRODUCTION

Abdominal wall hernias may be classified as groin hernias (inguinal or femoral) and ventral hernias (umbilical, epigastric, spigelian, lumbar and incisional). Seventy five percent of all abdominal wall hernias are found in the groin^{1,2}. And of all the groin hernia inguinal hernias is by far the most common type when compared to femoral hernia. Facility based study done in Ghana indicates that inguinal hernia is the most common external hernia seen accounting for 70.5% of over 2000 cases and

most commonly seen in male adults³. In the global scene an international and US survey conducted revealed the prevalence of non-surgically treated inguinal hernia among men as 5-7%⁴. Similarly in many African communities there are accumulated number of untreated inguinal hernias that have been over looked mostly due to lack of funds to access care or ignorance of the pathology⁵. Generally it is estimated that approximately 11% of the global disease burden that consists of miscellaneous but treatable surgical conditions are often neglected⁶. Furthermore in Africa hernia still places an

Article Access



Website: www.wjmb.org

10.5281/zenodo.12701585

How to cite this article

*Umezurike DAH, Ogbuanya OA, Amobi O, Olisa F, Okoli C, Eni EU, Obasi AA. . *OVoluntary Hernia Aid Program in Rural Nigeria: Analysis of 152 Consecutive Patients with Effective Groin Hernia Repairs-A Retrospective Study*. *West J Med & Biomed Sci*. 2024;5(2):85-92. DOI:10.5281/zenodo.12701585

economic burden in the countries because some patients with large hernias are not able to work. This was reported by Sanders that in Ghana that 22 (16%) of their patients were unable to work due to their hernia and in a further 87 (64%) of their patients the hernia limited daily activities³.

In addition to the above, untreated hernias can lead to complications such as incarceration, bowel obstruction, strangulation and fistulation which are potentially fatal⁷. From the historical perspective the treatment of hernias have evolved through many modifications but the approach is still open surgeries in the Sub-Saharan Africa (SSA) as well as in other low and medium income countries⁹. However, the developed countries of Europe and America practice laparo-endoscopic surgeries predominantly at present⁹.

Although the repair of abdominal wall hernia is one of the most commonly performed operations the repair rate is still a tip of an iceberg compared to the prevalence of the disease. Kingsnorth et al noted that in Africa, the yearly incidence of inguinal hernia reaches approximately 175 per 100,000 but approximately only 14.3% of inguinal hernias are repaired despite the demonstrated benefit of elective hernia repair in reducing mortality and morbidity from bowel obstruction, strangulation and fistulation⁶.

It therefore means that if significant progress in reduction of burden of hernia is to be made in rural communities' approaches that will overcome the barriers to elective hernia uptake has to be deployed through well-organized surgical outreaches that also strengthen local capacity. During a free surgical/medical outreach program people with various sizes of hernia voluntarily present themselves for elective surgeries.

This study was aimed at assessing the impact of voluntary hernia aid program in rural Nigeria.

MATERIALS AND METHODS

Design and setting

This was a descriptive retrospective study. The humanitarian health aid services presented as the subject of this research was carried out between

March and Jun 2019 in the Niger Delta region of Southern Nigeria. One Hundred and Fifty two records of patients attended to in the free medical aid program diagnosed and treated for groin hernias were enrolled in the study.

There were three sessions of the outreach program within the period under review. The surgical camps located in the general hospitals in the locality been served were prepared by God's Delight Health Care as the registered health agents/providers with the Niger Delta Development Commission (NDDC). NDDC is a parastatal of the Federal Government of Nigeria charged with the responsibility of fast-tracking development and social services to the oil rich but impoverished Niger Delta region of Nigeria.

Study participants/subjects

All consecutive one hundred and fifty two (152) patients who presented in response to the publicity for the outreach and whose elective groin hernias were repaired during this program were included in the study. However patients below the age of twelve years and those with significant missing records data were excluded.

Procedure

Outcomes obtained as results of all surgical practice including the socio demographic data of the patients, clinical/pathological characteristics of the hernias were noted and recorded in a proforma. Furthermore the comorbidities, the main reasons for late presentation, anaesthetic techniques, cadre of surgeon, surgical techniques and early postoperative complication were noted and analysed.

Data analysis

Data analysis was done using statistical package for social sciences (SPSS) software version 25.0 (IBM, Chicago, IL USA, 2018). The data were presented in tables as mean, standard deviations and percentages. The different variables were measured and compared using Chi Square (X^2) test. While confidence interval was calculated at 95% level. The reliability significance was at 5% probability level ($P < 0.05$).

Ethical approval

The ethical approval for the study was granted by

God's Delight Healthcare and the health facilities involved in this study.

RESULTS

In the three sessions of medical outreach program spanning through 2nd March to 20th June 2019 a total of 174 groin hernia repairs were done in 152 patients. Of these 152 patients, 134 of them were males (88.2%) while 18 (11.8%) were females. We observed that the hernias occurred on the right, left and both sides of the groin in 59 (38.8%), 71 (46.7%) and 22 (14.5%) respectively. Also in the males there was left sided predominance. The patients were mainly farmers, artisans, civil servants, traders and unemployed. The highest level of education attained was primary (41.4%) and secondary (36.2%) school levels by most patients table 1.

Table 2, shows the clinical characteristics of the groin hernias and the frequency of occurrence of inguinal hernia is 171 (98.3%) while femoral hernia accounted for 7 (4.0%) of cases. Majority of patients harbored their hernias between 1-5 years (48.0%). Similarly the extent of herniation was mostly inguinoscrotal (46.7%).

The early post operative complications include scrotal oedema/haematoma, seroma and reactionary haemorrhage as shown in table 3. A comparison of the extent of herniation with the risk of developing early postoperative complication yielded no significant difference ($P>0.05$) see table 4.

Table 5 shows the main reason recorded for the delay in accessing care for the patients who harboured their symptoms for more than one year. The major barrier to access care was due to lack of fund (71.3%). Other important reasons include fear of surgery (13.9%) and that no surgical services available (8.7%).

Table 1: Socio-demographic characteristics

Variables	Frequency (n=152)	Percentage (%)	$\chi^2(P\text{-value})$
Age (years)			
12 -22	23	15.1	19.895 (<0.001)
23 -44	29	19.1	
45 -64	59	38.8	
>64	41	27.0	
Gender			
Male	134	88.2	91.605 (<0.001)
Female	18	11.8	
Occupation			
Farming	61	40.1	48.329 (<0.001)
Trading	12	7.9	
Artisan	36	23.7	
Civil Servant	20	13.2	
Students	23	15.1	
Educational Status			
Informal	17	11.2	47.263 (<0.001)
Primary	63	41.4	
Secondary	55	36.2	
Tertiary	17	11.1	
Side affected			
Right	59	38.8	25.748 (<0.001)
Left	71	46.7	
Bilateral	22	14.5	
Side affected in male (n=134)			
Right	56	41.7	28.902 (<0.001)
Left	60	44.8	
Bilateral	18	13.4	

Table 2: Clinical and pathological characteristics of study participants

Variables	Frequency (n=152)	Percentage (%)	$\chi^2(P\text{-value})$
Duration (years)			
<1	37	24.3	88.132 (<0.001)
1 -5	73	48.0	
5 -12	13	8.6	
>12(not from birth)	12	7.9	
>12 (from birth)	17	11.2	
Extent of herniation			
Buibocele	15	9.9	137.816 (<0.001)
Funicular	13	8.6	
Femoral	7	4.0	
Recurrent	39	22.4	
Inguinoscrotal	71	46.7	
Giant	7	4.0	
Comorbidities			
Present	27	17.8	61.908 (<0.001)
None	124	82.2	
Length of inguinoscrotal (cm)			
<10	58	38.2	23.316 (<0.001)
10 -15	39	25.7	
16 -20	16	10.5	
>20	39	25.7	
Side Affected			
Right	59	38.8	25.748 (<0.001)
Left	71	46.7	
Bilateral	22	14.5	
Side affected in male (n=134)			
Right	56	41.7	28.902 (<0.001)
Left	60	44.8	
Bilateral	18	13.4	

Table 3: Early Postoperative Complication

Parameters	Frequency (n=152)	Percentage (%)	χ^2 (P - Value)
Early Postoperative Complication.			
Scrotal Oedema	5	3.3	
Seroma	4	2.6	
Haematoma	3	2.0	
Reactionary hemorrhage	2	1.3	796.211(<0.001)
Paralytic ileus	2	1.3	
Urinary Retention	1	0.7	
Bladder Injury	1	0.7	

Table 4: Extent of Herniation of Hernia vs early Postoperative outcome

Parameters	Frequency (n=152)	No. of Pos OP Complications	Percentage (%)	χ^2 (P - Value)	RR (95% C.I of RR)
Extent of Herniation					
Bulbonocele	29	2	6.9	5.24(0.155)	1
Funicular	21	3	14.3		1.09(0.89 -1.3 3)
Inguinoscrotal	87	14	16.1		1.11(0.97 -1.27)
Giant	15	5	26.7		1.40(0.96 -2.02)

Table 5: Main reason for delay in accessing care for patients with harbor symptoms more than one year

Main reason	Frequency (n=152)	Percentage (%)	χ^2 (P - Value)
No Money	82	71.3	82.409(0.001)
Fear Mistrust	16	13.9	
No Surgical Service	10	8.7	
No Time	4	3.5	
Others	2	1.7	
No need / Pain	1	0.9	

DISCUSSION

Report of local experiences is worthwhile because it can provide database and add to the ever-increasing body of knowledge. The groin which is the skin crease area between the lower abdomen and upper thigh in both sides is usually covered by attire, and happens to be the commonest site for hernia formation. Unfortunately, in the rural areas hernias in this region are neglected by many afflicted individuals until they present with complications. Elective repair of groin hernias are safe and more cost effective than complicated ones but there are barriers to early repairs in SSA and LMICs.

In our study we observed that inguinal hernias were the most common types of hernias accounted for a total of 149 (98.0%) while femoral hernia made up the remaining 7 (4.0%) of our patients. This finding is in agreement with that of Mohamed et al who reported the rates of occurrences of indirect, direct and strangulated hernias as 119 (66.2%), 44 (24.4%) and 17 (9.4%) in that order¹⁰. Akinci et al also noted

the predominance of indirect hernia variety to others as indirect 483 (50%), direct 342 (36%), and femoral 40 (4%) respectively¹¹. In the study done by Ayandipo et al in Ibadan Nigeria their findings also corroborated the same trend of 628 (68.1%), 182 (19.7%), 74 (8%) and 39 (4.2%) representing indirect, direct, pantaloon and others not stated types in that order in conformity to previous literatures¹². This could be attributed to the natural passageway for the testes in males and round ligament of the uterus in females.

Our study population were mainly farmers, artisans, traders, civil servants and non working class age group (students) with significant low socio-economic status of the rural populace. Farmers are the most commonly affected occupation (40.1%) while traders are the least affected 7.9%. Manual farming activities and artisans who engage in lifting heavy objects are known risk factors for hernia development.

There is no age restriction to the development of groin hernias but many studies have shown two peaks of increased incidence at childhood and 3rd-4th decades of life¹³. These corresponds to the presentation of hernia of congenital origin and the time of increased muscular activities respectively. However in our study there was increasing incidence with age. Constance et al documented a similar trend that the incidence of inguinal hernia increased noticeably with age among men. Their study further

showed that middle aged men had over twice the incidence to younger men and that the risk increased to almost three times among older men¹⁴ older men perhaps with weight loss, bladder outlet obstruction may constitute to development of hernia. In fact, the male preponderance of inguinal hernia almost paint the picture to health workers that it is a disease exclusive to men. One hundred and thirty four 134 (82.%) of our patients were males while eighteen 18 (11.8%) were females giving a male to female ratio of 7:1.1. Men are known to be involved more in strenuous activities as farmers and artisans that can increase intra-abdominal pressure which is a known risk factor for hernia.

Ojo et al also observed a male predominance with a male to female ratio of 6.5:1 in their study¹⁵, though slightly lower than our figure. The male preponderance could be attributed to the descent of male reproductive organ through the inguinal canal as noted by Waweru². In men indirect inguinal hernias follow the route as the descending testis which migrate from the abdomen into the scrotum during the development of the urinary and reproductive organs. The large size of their inguinal canal which transmitted the testicles and accommodated the cord structures might be one of the reasons why men are 25 times more likely to have an inguinal hernia than women².

The overall incidence of abdominal wall hernia in different countries varies from 100- 300 / 100, 000 per year¹³. But the life time risk of developing inguinal hernia is 15-27% in men and 3% in women¹³. In addition to the embryological causes of inguinal hernia preponderance in males than females Sangwan et al also attributed this fact partly to the trend that males are more involved in strenuous work in Agriculture while females are predominantly engaged in household works¹³. This also corroborated with our observation that farmers were the most commonly affected occupation in this work. However, this is at variance with the report of Constance and James who stated that increased intra-abdominal pressure has for long been suspected in the pathogenesis of inguinal hernia though with little quantitative evidence. Their investigation didn't find any association with additional factors that might

exert an effect through such mechanisms including physical activities, constipation, chronic cough and chronic obstructive pulmonary diseases¹⁴.

An unexpected finding in our report is that more number of patients had their lesion on the left than the right side of the groin. We observed left sided groin hernias in 71 (46. 7%), right sided in 59 (38.8%) and bilateral cases in 22 (14.5%) patients. We went further to investigate hernias in our male patients and still observed left sided preponderance in contrast to the report of Waweru who observed that fewer inguinal hernias were seen in ages 16 to 20 years, which he attributed to developmental anomalies of the inguinal region associated with testicular descent in the young and weakening of inguinal canal. As a result of this, inguinal hernias are four times more common on the right than on the left. This agrees with previous observations of right sided predominance which has been linked to later descent of the right testis; an anatomical fact that also explains the higher incidence of inguinal hernia disease in males compared to females¹⁶.

On the other hand Olasheinde et al reported on 93 patients who had inguinal hernias, 9 were bilateral, 42 were left sided while 42 were right sided showing no difference with regard to laterality¹⁶. They stated further that the predominance of inguinal hernia in their study certainly conforms to general knowledge¹⁷ except that the usual right sided preponderance observed in males which has also been reported by some authors among females to be the range of 15:1.5 was not so observed in their study with equal number of right and left sided inguinal hernias. The basis for the right sided predominance in males which is the later descent of the testis on the right side is a phenomenon that is not existent in females. Those who have observed right sided predominance have not been able to attribute it to any scientific hypothesis¹⁸ and as such may be considered a chance finding. The embryological basis for the development of inguinal and umbilical hernia explains why these were the major hernia types found in patients less than 20 years¹⁸.

Of the two types of groin hernias femoral hernia is far less common than inguinal hernia and accounted for 7 (4.0%) of our patients. This is in consonance

with the study done by Olasheinde et al who documented the same 4% incidence rate¹⁶. Other researchers found similar figures across the globe. In Denmark femoral hernia constituted 4% of groin hernia¹⁹ and in Uganda femoral hernia constituted 6.3% of groin hernias²⁰. In other publications femoral hernia may constitute up to 8.5% of abdominal wall hernias²¹ and still Javid et al documented 1.5% of groin hernias been due to femoral hernias¹. However, all literature above is in agreement that inguinal hernia is commoner in males than females due to the gender difference in the anatomy of the pelvis^{1,18}.

Majority of our patients presented with inguinoscrotal hernias in 71 (46.7%) of cases far more than bulbonocele 15 (9.9%) and funicular 13 (8.6%) types. Recurrent hernias 39 (22.4%) and giant inguinoscrotal hernias 7 (4%) were other challenging modes of presentation with respect to the surgeries. A similar outreach program reported by Ojo et al in the North Eastern region of Nigeria encountered the same pattern of surgical conditions frequently long in duration and huge in size¹⁵. Co-morbidities were noted in 27 (17.8%) of patients and included hypertension, diabetic mellitus and congestive cardiac failure in which case most of the patients were on medication. In any case all the patients were adequately controlled and optimized before surgery. This is because premorbid states have a role in increasing morbidity and mortality in intra and post operative periods.

In a prospective study done by Ogbuanya et al more than three quarter (78%) presented after one year of noticing the hernia and of these 61.5 (48) patients waited till 5 years of onset of hernia before presentation²². This study also documented a similar trend of delay in accessing care as 82 (71.3%) and patient harbor their hernia symptoms for more than one year. The main reason for this delay was lack of fund, mistrust and unavailable surgical services in the rural arrears. However, outreach programs ensures provision of surgical services in the locality of rural dwellers, reduces inconveniences, expenses and overcomes several barriers to assessing care.

The procedures done for all the patients in our study were open surgeries using tissue-based repairs. The

procedures were performed under spinal and general anaesthesia or combination of the two in 123 (80.9%), 17 (11.2%) and 12 (7.9%) respectively.

The overall early post operative complications was 11.8% and included scrotal oedema/haematoma, seroma, reactionary heamorrhage. There was one case of inadvertent injury to the urinary bladder. The bladder diverticulum was tied and excised with the sac and it healed satisfactorily with continuous bladder drainage for other early post operative complications were successfully managed conservatively. The report from another outreach program in a teaching hospital setting recorded Post Operative complication rate of 23 (9.2%) while Ogbuanya and Emedike in their study documented overall post-operative complications rate of 14%²⁴.

CONCLUSION

The burden of groin hernias in the rural communities of developing countries is enormous and the uptake of elective repairs are low. The disease is commoner in male adults than in the female counterparts. Hernia chronicity in the rural communities is real and they present as inguinoscrotal lesions mainly on the left side of the groin. The main reason for delay in accessing health care was due to fund and mistrust. However, as shown in this report a surgical specialist outreach program can fast tract the provision and overcome obstacles to quality health care at the tertiary health facilities.

Recommendations

- Collective efforts and unanimous agreement of both surgeons and health policy makers can make this expertise more widely available to assist in establishing crucial, self sustaining and autonomous survival of rural health care.
- There should be re-evaluation and equitable distribution of enablers of health care services (human and material resources) to cover rural areas adequately.

Conflict of Interest

There was no conflict of interest encountered during this research work.

Limitation of the Study

This is a retrospective study with the inherent

problem of incomplete records. Also the lack of standardization of measurement of variables and outcomes might have affected the accuracy of the data presented.

Acknowledgement

We express our sincere gratitude to the Chief Executive Officer (CEO) and members of the God's Delight Healthcare for all their support and assistance.

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