

CHALLENGES OF INGUINAL HERNIA SURGERY IN GHANA

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Abstract

Background: In Ghana inguinal hernias are a very common cause of considerable morbidity and significant mortality especially in rural communities.

Objective : To perform a brief review of the published data on the epidemiology of and the surgical output on inguinal hernia in Ghana.

Method : In this review the author presents data from a series of recent publications derived from his work on inguinal hernia in Ghana. Other articles that also have data on inguinal hernia surgery in Ghana were selected in support of or to compliment the publications in possession of the author. The search terms used to select these articles were : inguinal hernia in Ghana, groin hernia epidemiology in Ghana, hernia repair, strangulated inguinal hernia, inguinal hernia surgery output in Ghana in Medline, Pubmed and Embase. All journal articles containing information on inguinal hernia epidemiology and surgical output between

January 1, 2000 and November 30, 2015 were selected and carefully analyzed for data on inguinal hernia prevalence and repair or operations.

Results : Literature on inguinal hernia surgery in Ghana is mostly clinical reports based on analysis of hospital based patients. Two sources of population based data were available but were nearly four decades apart. Based on this data inguinal hernia is very prevalent in Ghana. However, surgical correction rates are very low leaving many men with longstanding untreated inguinal hernias.

Conclusion : Inguinal hernia is very prevalent in Ghanaian men in both urban and rural communities. Access to hernia repair surgery is limited by patient education, health care costs and health facility capacity. Intervention is needed to build the capacity for increased hernia repair.

Key Words : *Inguinal Hernia, Epidemiology, Surgical Output, Ghana.*

Introduction

In Ghana inguinal hernia disease is very common. In a recent survey of 10 district hospitals in Ghana inguinal herniorrhaphy was a frequent major surgical procedure performed second only to Caesarean section¹. Hospital data from the second largest Teaching Hospital in Ghana indicates that inguinal hernia is the most common external hernia seen accounting for 70.5% of over 2000 cases² and most commonly seen in male adults. Over the past three decades or more strangulated inguinal hernia is still the most common cause of acute bowel obstruction in Ghana³. All these data when considered together suggests that inguinal hernia is very prevalent and an important disease in Ghana.

The treatment of inguinal hernia is by a surgical operation. However inguinal hernia repair rates in Ghana are low estimated at 30 repairs per 100 000 population per year^{4,5}. The high prevalence alongside the low repair rates results in the situation where there is an accumulation of large numbers of untreated inguinal hernia in many communities in Ghana^{5,7}. This paper is a review of the available data on inguinal

hernia prevalence and repair rates in Ghana over the years. The purpose of the review is to highlight the wide gap between prevalence and repair rates and to consider what can be done to increase repair rates and narrow the gap.

Methodology

In this paper the author reviewed the data from a series of recent publications derived from his work on inguinal hernia in Ghana. Other articles that also have data on inguinal hernia surgery in Ghana were selected to support or to compliment the publications in possession of the author. The search for these other articles was done using Medline via Pubmed and Embase. The key words used for the search were hernia in Ghana/ inguinal hernia in Ghana/ inguinal hernia in sub Saharan Africa/ strangulated inguinal hernia. Only articles published in English language were considered for selection. These search yielded some 25 abstracts and citations. The WHO sponsored network for access to publications on health- The Health InterNetwork Access to Research Initiative (HINARI) and the African Journal On Line (AJOL) access to medical research facilities were then used to locate articles that contained information or data on the prevalence of inguinal hernia, inguinal hernia surgery or repair in Ghana. The inclusion criteria for the articles in this review were: the article must have been published between January 1st 2000 and November 30th 2015, must contain data or information on the epidemiology, prevalence, surgical output and repair rates of inguinal hernia in Ghana.

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Results

Eleven articles satisfied the selection criteria for inclusion. Of the 11 articles two contained data or information on the epidemiology (including prevalence) of inguinal hernia and 9 papers had data or information on surgical output or repair rates of inguinal hernia in Ghana. Fourteen publications were excluded for lack of data or information on either prevalence or epidemiology and surgical output / repair of inguinal hernia in Ghana. The 11 publications selected were added to 8 publications in possession of the author. Thus a total of 19 papers were used for the review. Of the 19 articles 15 were published within the period between January 1, 2000 and November 30th 2015. Four other papers published outside the review period were also selected for the review because one paper contained data on the prevalence (1978), and three papers on surgical output (1970, 1984, 1993) of strangulated inguinal hernia in Ghana.

Discussion

Prevalence of inguinal hernia in Ghana

Inguinal hernia is very prevalent in Ghana especially in rural communities. Over three decades ago Belcher and his colleagues using standard public health methods determined that the prevalence of inguinal hernia in adult men was 7.7% rural southern Ghana⁶. Beard used a mathematical epidemiologic model to estimate the prevalence of inguinal hernia in Ghana at 3.15% of the general population and calculated that 800 000 Ghanaians have inguinal hernia today⁵. In a recent well designed population - based study in the Barekese sub-district of Ashanti region Ohene-Yeboah and his co-investigators estimated the over-all prevalence of untreated inguinal hernia as 10.8% of adult males, varying from 5.1% in men aged 15-44 years to as high as 32.3% in men aged 65 years or above (table 2). Based on the prevalence figures it is estimated that there are 780 397 adult men living with unrepaired hernia in Ghana today⁸.

Table 2. Prevalence of treated and untreated inguinal hernia in 803 men in the Barekese sub-district of Ashanti, Ghana⁽⁸⁾.

Age group (years)	Number of men	Inguinal hernia prevalence (95 % CI)	Scar prevalence (95 % CI)	Treated and untreated inguinal hernia prevalence (95% CI)
15-44	557	5.1 (2.9, 7.2)	1.4 (0.5, 3.0)	6.6 (3.8, 9.4)
45-64	181	20.4 (14.6, 26.2)	4.4 (1.4, 7.4)	24.9 (18.7, 30.8)
65 or older	65	32.3 (20.9, 43.7)	3.1 (0, 7.5)	35.4 (23.6, 47.2)
Total	803	10.8 (8.0, 13.6)	2.2 (0, 5.4)	13.0 (10.2, 15.7)

Inguinal hernia surgery output in Ghana: low repair rates.

Inguinal hernia surgery output from Ghana is very low. A recent review of case series of strangulated inguinal hernias from four health facilities in Kumasi: namely the Komfo Anokye Teaching Hospital, the Seventh Day Adventist, the University and the Kumasi South Hospitals over a period of five years (2007-2011) revealed some amazing facts about surgery for inguinal hernia in Ghana⁹. In each year of study less than 1% of the estimated 44 917 adult men in Kumasi who require a surgical correction actually got a repair done. In the teaching hospital more emergency hernia projections. A mathematical model of inguinal hernia epidemiology in Ghana estimates that at the current rate of repair of 30 per 100,000 population there could be a backlog of one million inguinal hernia cases that need repair over the next 10 years, figure 1⁵. Furthermore the impact of the current repair rates of 30 per 100 000 population is almost similar to a zero repair rate⁵.

repairs were done compared with elective herniorrhaphy.

Further information on inguinal hernia repair rates in Ghana was obtained from the population -based study of Barekese⁸. This study revealed that population based repair rates (measured as scar prevalence rates in the population) in Barekese sub-district of Ashanti region was 2.2% and varied from 1.4% in adult men aged 15-44 years to 4.4% in the age group 45-64 years (table 2). The wide gap between the prevalence and repair rates of inguinal hernia in Ghana is further highlighted using epidemiological

The scourge of untreated inguinal hernia: strangulations, obstructions and intestinal necrosis.

Complications of untreated inguinal hernia are potentially fatal. In a report on strangulated external hernias in adults in Kumasi Ohene-Yeboah documented the high morbidity and mortality associated with surgery for strangulation¹⁰.

In that study the bowel resection rate for strangulated inguinal hernia with intestinal necrosis was 18.7%. The associated mortality rate was 6.2%. In a review of a series of 652 cases of acute bowel obstruction in Kumasi, Ghana, Ohene-Yeboah and his colleagues reported that half (49%) of the patients had a pre-operative diagnosis of strangulated inguinal hernia³. The mortality from strangulated inguinal hernia in this series was 8.5%. The over- all mortality for bowel obstruction was 12%.

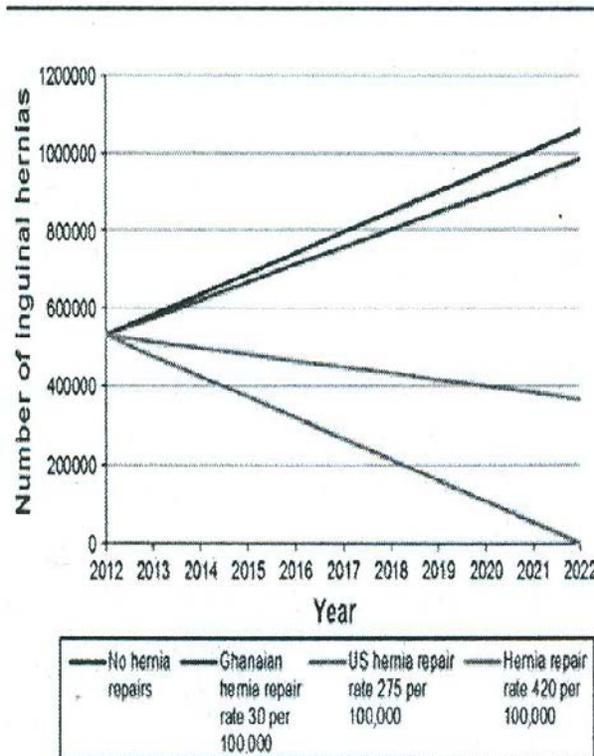


Figure 1. Projection of inguinal hernia prevalence in Ghana over the next ten years⁽⁵⁾

In earlier reports by Badoe¹¹, Archampong¹² and Naaeder¹³ strangulated inguinal hernia was the most important cause of bowel obstruction in Ghana with a mortality of 10%. It is a fact of life in Ghana that many men (young and old) in the rural farming communities may be unable to work as a consequence of large or complicated inguinal hernias⁷. In one such a case a 49 – year old farmer lost several months of yam production when he developed an entero-scrotal fistula as a result of a neglected strangulated left inguinal hernia¹⁴. That year this farmer was in hospital for several weeks away from his farm. These data when considered together make a strong case for the need to increase the elective repair rate of inguinal hernia to prevent these complications. Many surgeons believe that strangulated inguinal hernia is a preventable emergency and that in

hernia surgery an elective repair prevents an emergency operation.

Barriers to elective repair of inguinal hernia.

The health care system.

In Ghana the health care system lacks the capacity to meet the need of inguinal hernia surgery. Recently Abantanga and co- investigators surveyed 10 district hospitals in Ghana in order to document the range of surgical operations that are performed in these hospitals and the capacity of these hospitals to perform¹. They reported that Ghana appears to be relatively unique among developing countries in that the district hospitals are relatively well equipped with supplies and equipment and the number of supporting staff appear adequate. Ghana is however lacking in trained personnel to perform these basic surgeries¹. The limited number of trained surgeons and experienced medical officers especially in the district hospitals constitutes a major barrier to elective repair of inguinal hernia in Ghana.

Inguinal hernia disease awareness

The level of awareness of inguinal hernia as a surgical disease among the adult male population is low. The results of population-based study in which participants completed an interviewer administered questionnaire that probed their knowledge, attitudes and practices regarding inguinal hernia disease are revealing⁸. Of the 87 men with untreated inguinal hernia 54(62.8%) knew that a medical doctor can cure the hernia however 33 of them (36%) believed that a herbal or traditional practitioner can also cure the hernia. Furthermore of the 54 men with untreated inguinal hernia who chose to see a doctor only 18 of them 33.3% expected to have a surgical operation, 36 of them 66.7% would prefer some form of medication or non – surgical treatment as surgery was considered too expensive or unsafe. Men who failed or delayed to seek medical advice for an inguinal hernia cited high cost of surgery 48.8%, fear of death from anaesthesia, of impotence and of surgical complications 32.7%, preference for traditional treatment 12.8% and long waiting time at hospitals 5.7% as the reasons for the behaviour.

To achieve control over inguinal hernia disease Ghana needs a repair rate of 420 per 100 000 population far above the current US repair rates of 275 per 100 000 population⁵. This is a formidable task that requires a focused attention and approach to address the lack of trained personnel and to remove the misconceptions that constitute barriers to increasing repair.

Interventions.

Operation Hernia Foundation

Already efforts are underway to increase the hernia operations in some communities in Ghana. The Operation Hernia Foundation based in Plymouth

Table 3. A multi-faceted approach to expand the capacity for hernia repair in Ghana ⁽⁸⁾

Awareness	Advocacy	Repair	Research
<p>Create population awareness of :</p> <ol style="list-style-type: none"> 1. Inguinal hernia causes and treatment 2. The potential life threatening complications of untreated inguinal hernia 3. Resources available for hernia repair (camps, nearby hospitals) <p>Inform Government of the negative impact of untreated Inguinal Hernia on productivity and GDP</p> <p><i>Methods</i> Radio and television programs and advertisements</p>	<p>Policy change on inguinal hernia :</p> <ol style="list-style-type: none"> 1. Advocate for inguinal hernia as a public health priority similar to malaria, TB and HIV. 2. Educate government on the prevalence of hernia and negative impact of hernia on population productivity 3. Advocate for NHIS to cover full cost of hernia repair including mesh 4. Coordinate with government and development partners for hernia repair voucher program 5. Advocate for licensing of NPCs to perform hernia surgery <p><u><i>Collaborators</i></u> Ministry of Health, Ghana Hernia Society, The Parliamentary Select Committee on Health, Conferences of Regional and District Directors of Health, Global Development partners.</p>	<p>Goal : to increase the repair rate of inguinal hernia from 30 to 90 per 100,000 population per year in 10 years.</p> <p>Program for training non-surgeon clinicians outlined in Figure 1</p> <p><u><i>Collaborators.</i></u> Ministry of Health, Ghana Hernia Society, Global development partners.</p>	<p>A comprehensive national database on Inguinal Hernia collecting information on :</p> <ul style="list-style-type: none"> -epidemiology -risk factors -clinical presentations surgical output, outcomes -repair rates -ongoing data collection to assess the effectiveness of the educational interventions <p><u><i>Supervision</i></u> Ghana Hernia Society</p> <p><u><i>Management</i></u> <u><i>Sites.</i></u> Departments of surgery of the three major teaching hospitals in Ghana.</p>

England has set up Ghana’s first ever hernia centre in the west of the country¹⁵. Using the facilities at the centre a group of European surgeons visit to operate alongside their Ghanaian counterparts to perform up to 50 repairs per visit¹⁶. There are other groups from Poland that also provide short term humanitarian medical projects or missions to repair inguinal hernias in the north of Ghana¹⁷. These are excellent examples of international support and collaboration needed to strengthen the health system of Ghana to meet the needs of inguinal hernia surgery. Nevertheless Ghanaian surgeons have to initiate programmes that are comprehensive and address all aspects of the disease.

Ghana Hernia Society

The Ghana Hernia Society (GHS) ¹⁸ is an association of surgeons who have special interest in anterior abdominal wall and inguinal hernia surgery. It is a response to the suggestions outlined in a recent review on inguinal hernia disease in Africa¹⁹. Members of this society are committed to a multi –faceted approach to the hernia disease burden in Ghana and will

lead the implementation of a program aimed at surgical capacity building to increase access to inguinal hernia repair surgery. This approach involves awareness creation, advocacy, repair of hernias and research (table 3). The first line of action involves a collaboration with Health Promotion Department of the Ghana Health Service to inform the public that untreated inguinal hernia may develop life- threatening complications requiring expensive emergency care with poor outcome and to emphasize that the disease is curable with a safe and effective surgical operation.

Recently Kingsnorth and his co –authors summarized the available evidence that indicated that there is a need for major policy changes in hernia surgery in Ghana²⁰. In the second line of action members of the GHS will provide strong advocacy for these policy changes that have the potential to increase the capacity to access inguinal hernia surgery. These policy changes include: listing inguinal hernia as public health priority similar in importance to malaria, TB and HIV, accepting a nation-wide use of the Lichtenstein tension free mesh repair for inguinal hernias, licensing non – physician clinicians to

undertake hernia repair, expanding the coverage of the NHIS to cover the cost of mesh and other indirect costs of surgery and considering a payment voucher to motivate hernia operators.

Thirdly the members of the GHS must spearhead a campaign to increase the repair of inguinal hernias from 30 to 90 repairs per 100 000 population per year over the next five years. The campaign involves a collaboration with Co-operate Ghana and the Ghana Association of Industries and our Global Developmental Partners to fund regular outreach services to district hospitals to perform hernia surgery and train medical officers in mesh repair as well as regular courses and workshops on mesh repair of inguinal hernia (table 3).

In addition a comprehensive national data base or bank on the epidemiology, risk factors, clinical presentation, surgical output and correction rates and complications will be compiled. This has to be coordinated and supervised by the Ghana Hernia Society and based at the departments of surgery of the three major teaching hospitals. Data on traditional and other non surgical treatments of the disease as well as the level of awareness of the population on inguinal and other hernias could become available. This is the kind of data that health planners in Ghana need to meet the needs of the increasing population of hernia sufferers.

Conclusions

Inguinal hernia disease in Ghana is characterized by the extremes of high prevalence but low rates of repair. The condition is an important cause of morbidity and mortality in both urban and rural communities. Access to hernia repair surgery is limited by patient education, health care costs and health facility capacity. Intervention to build the capacity for increased hernia repair could consist of a multifaceted program aimed at increasing patient awareness, health policy advocacy, increased repair rates through increased outreach services, training of medical officers and non-surgeon physicians and ongoing pragmatic research. Such a program is likely to narrow the gap between the prevalence and repair rates of inguinal hernia in our communities.

References

1. Abantanga FA, Hesse A, Sory E, Osen H, Choo S et al Policies for improving access to quality of basic and essential surgical care of district hospitals in Ghana. *Post Grad Med J Ghana*. 2012;1: 3-8.
2. Ohene-YeboahM, Abantanga F, Oppong J, Togbe B. Some aspects of the epidemiology of external hernias in Kumasi, Ghana. *Hernia* 2009; 13: 529-532
3. Ohene-Yeboah M, Adippah E, Gyasi-Sarpong K. Acute intestinal obstruction in adults in Kumasi, Ghana. *Ghana Med J* 2006; 40: 50-54.
4. Grimes CE, Law RSL, Borgstein ES, Mkandawire NC, Lavy CBD. Systematic review of met and unmet needs of surgical disease in rural sub-Saharan Africa. *World J Surg* 2012; 36: 8-23.
5. Beard JH, Oresanya LB, Ohene-Yeboah M, Dicker RA, Harris HW. Characterizing the global burden of surgical disease: A method to estimate inguinal hernia epidemiology in Ghana. *World J Surg* 2013;37: pg 498-503.
6. Belcher DW, Nyame PK, Wurapa FK. The prevalence of inguinal hernia in adult Ghanaian males. *Trop Geo Med* 1978; 30: 39 – 43.
7. Sanders DL, Porter CS, Mitchell KCD, Kingsnorth A. A prospective cohort study comparing the African and European hernia. *Hernia* 2008; 12: 527-529.
8. Ohene-YeboahM, BeardJ, Frimpong-Twumasi B, Koranteng A, Mensah S. Prevalence of inguinal hernia in adult men in the Ashanti Region of Ghana. *World J Surg* 2015 online DOI 10.1007/s00268-015-3335-7
9. Ohene- Yeboah M. Dally CK. Strangulated inguinal hernia in adult males in Kumasi. *Ghana Med J* 2014; 48: 101-105
10. Ohene-Yeboah M. Strangulated external hernias in Kumasi. *West Afr J Med* 2003; 22: 310-313.
11. Badoe EA. Acute intestinal obstruction in Kor Le Bu Teaching Hospital, Accra: 1965-1969. *Ghana Med J* 1970; 9: 283-287
12. ArchampongEQ, Owusu PA and Amankwa JA. The pattern of acute intestinal obstruction at Korle Bu teaching Hospital, Accra. *West Afr J Med* 1984; 263-270.
13. Naaeder SB, Archampong EQ. Changing pattern of acute intestinal obstruction in Accra. *West Afr J Med* 1993;12: 82-88.
14. Ohene-Yeboah M. Entero-Scrotal fistula in a Ghanaian adult: a case report of the spontaneous rupture of a neglected strangulated inguinal hernia. *Hernia*. 2011; 15: 455-457.
15. Sanders DI, Kingsnorth A. Operation hernia: humanitarian hernia repairs in Ghana. *Hernia* 2007;11: 389-391.
16. Clarke MG, Oppong C, Simmermacher R, Park K, Kurzer M, Vanotoo L, Kingsnorth AN. The use of sterilized polyester mosquito net for inguinal hernia repair in Ghana. *Hernia* 2009; 13:155-159
17. Mitura K, KozielS, Pasierbek M. Groin hernia surgery in northern Ghana—humanitarian mission of Polish surgeons in Tamale Pol Przegł Chir (*Polish J Surg*) 2015;87: 16-21
18. GhanaHernia Society (GHS).www.ghanahernia.org
19. Ohene-YeboahM, Abantanga F A. Inguinal Hernia Disease in Africa: A Common but Neglected Surgical Condition. *West Afr J of Med* 2011; 30: 77-83.
20. Kingsnorth A, Clarke MG, Shillcutt S. Public Health Policy Issues of Hernia Surgery in Africa *World J Surg*. 2009 33:1188-93.