Hernia Surgery in Uganda: An Experience of Doctors Worldwide

Uganda'da Fıtık Cerrahisi: Yeryüzü Doktorları Deneyimi

Orhan Alimoglu[1], Seyit Ankarali[2], Tunc Eren[1], Metin Leblebici[1], Busra Burcu[1], Tamador Shamaileh[3], Oya Cigerli[4], Sedat Tuzuner[4], M. Sait Ozsoy[1], Kerem Kinik[4]

[1] MD, Istanbul Medeniyet University, School of Medicine, Department of General Surgery
[2] MD, Duzce University, School of Medicine, Department of Physilogy
[3] The University Of Jordan, School of Medicine, Department of General Surgery
[4] MD, Doctors Worldwide Turkey

Abstract

Aim: Our aim was to evaluate, and report the experiences of the volunteer surgical team of Doctors Worldwide (DWW) Turkey during their medical activites in Uganda.

Materials and Methods: A surgical camp was organized by DWW Turkey between 3-8 February 2015 in the Butambala and Kampala districts of Uganda. The surgical camp, in addition to other surgeries, was intended to conduct herniorrhaphies for all forms of abdominal wall hernias. Outcomes obtained as results of all surgical practices, including the demographic data of the patients, the types of anaesthesiological, and surgical procedures performed were recorded, and analyzed.

Results: Surgical interventions were carried out under either general, spinal, or local anesthesia in a total of 115 patients with the diagnosis of inguinal hernia in 80 (69.57%), umbilical hernia in 15 (13.04%), and epigastric hernia in 9 (7.82%) cases. Additionally, operations were performed for hydrocele in 11 (9.57%) cases. Postoperative minor complications were met in 10 (8.70%) patients, and no postoperative mortality took place at the end of all operations.

Discussion and Conclusion: DWW Turkey Surgical Team conclude that, as an efficacious modality of treatment, surgery should be considered as one of the most important priorities when conducting humanitarian health aid programs.

Key Words: global surgery; hernia surgery; doctors worldwide; Uganda

Özet

Amaç: Yeryüzü Doktorları Türkiye'nin gönüllü cerrahi ekibinin Uganda'daki faaliyetleri ile ilgili deneyimlerini değerlendirerek bildirmeyi amaçladık.

Gereç ve Yöntemler: Yeryüzü Doktorları Türkiye tarafından 3-8 Şubat 2015 tarihleri arasında Uganda'nın Butambala ve Kampala bölgelerinde cerrahi kamp düzenlendi. Bu kampın amacı, diğer cerrahilere ek olarak, tüm karın duvarı fıtık tipleri için fıtık tamirlerinin gerçekleştirilmesiydi. Hastaların demografik verileri ile uygulanan anestezi ve cerrahi prosedürlerin tipleri kayıt edilerek incelendi.

Bulgular: Toplam 115 cerrahi hastasında operasyonlar genel, spinal ya da lokal anestezi ile yapıldı. Bunlardan 80'i (%69,57) kasık fıtığı, 15'i (%13,04) göbek fıtığı ve 9'u (%7,82) epigastrik fıtık tanısı almıştı. Ek olarak hidrosel tanısı ile 11 (%9,57) olgu ameliyat edildi. On (%8,70) hastada postoperatif minör komplikasyonlar gözlenirken, ameliyatların sonunda postoperatif mortalite gelişmedi.

Tartışma ve Sonuç: Yeryüzü Doktorları; etkin bir tedavi modalitesi olarak cerrahinin, insani sağlık yardımı programlarının düzenlenmesi sırasındaki planlamalarda en önemli önceliklerden birini oluşturması gerektiği kanısındadırlar.

Anahtar Kelimeler: küresel cerrahi; fıtık cerrahisi; yeryüzü doktorları; Uganda

Geliş Tarihi /*Received* : 18.08.2015
Kabul Tarihi /*Accepted*: 08.10.2015

Sorumlu Yazar/*Corresponding Author*
Orhan Alimoglu, MD, Professor of General Surgery
Istanbul Medeniyet University,Goztepe Training & Research Hospital, Department of General Surgery, Dr. Erkin Street, Kadikoy, 34730, Istanbul / TURKEY
E-mail: orhan.alimoglu@medeniyet.edu.tr

INTRODUCTION

There is an inequity of access to health care services between the world's richest and poorest countries. Sub-Saharan African countries, including Uganda, although carrying 25% of the world's disease burden, has only 2% of the world's human resources for health (1). Among all global health problems, surgically treatable diseases weigh heavily on the lives of people in resource-poor countries, and surgical care is emerging as an important issue in public health worldwide (2). More than almost two billion people do not have adequate access to surgical care (3). Recent studies report the population having no access to safe and affordable surgery as two-thirds of the entire world's population – about five billion people (4).

Despite the fact that hernia repair is one of the most frequently performed surgical operations worldwide, more than half of hernias may be untreated in African countries that lack adequate and affordable surgical care (5,6). In Western Europe, the lifetime risk of undergoing groin hernia surgery has been estimated to be 27% for men, and 3% for women (7). Even though estimates based on health services data roughly range from 7.7% – 25% in men, the number of population-based studies is insufficient to reflect the true prevalence of groin hernia in sub-Saharan Africa (6,8,9). Estimates of groin hernia prevalence in sub-Saharan Africa range from 3.15% to 25% (10).

Groin hernia is a collective term for inguinal and femoral hernias, and defines a protrusion of abdominal contents through a weakness in the abdominal wall in the groin (11,12). Groin hernia, being the most common hernia type, is a common surgical condition affecting over 200 million people, and over 40000 people die due to its complications every year all around the world (12). Annual groin hernia repair frequency is estimated to be more than 20 million worldwide, and specific rates by country vary from 100 to 300 per 100000 population subjects per year (13). Only in the United States, groin hernia surgery is performed over 700000 per year (14). According to prediction values, although the average need in Africa is 175 inguinal hernia repairs per 100000 population annually, only 25 repairs per 100000 are actually performed in Africa each year (6).

Although hernias can be effectively treated by surgical repair, it is performed inadequately in Africa due to the high cost of surgery. Thus, in African countries there are a large population with untreated inguinal hernias that have been neglected. A large proportion of inguinal hernias in adults present to the hospital as emergencies in Africa. Hence, most hernia repairs in Africa are generally performed as high-risk emergency procedures. Therefore, longstanding cases contribute to a high prevalence of hernia, and are associated with significant morbidity and mortality such as strangulation and intestinal obstruction (6,15).

Uganda is a low-income country in eastern Africa. The estimated population is about 38 billion, and the health system is very poor (16). In 2012, there were around 200 surgeons, 125 obstetricians and 17 anesthesiologists in Uganda (17,18). Of those registered, several may not even be clinically active. Most major surgeries are undertaken by non-specialists. The unmet operative need in Uganda is very high (18). At the same time, non-specialist practitioners are needed to be trained in order to perform hernia repair operations due to the high frequency of hernias in Africa, including Uganda (19).

A group of international medics got together and established Doctors Worldwide (DWW) in 2000 as a non-governmental organization (NGO). With a head office in Manchester, UK, the organization then expanded and created a branch – Doctors Worldwide Turkey. Since then, DWW has been trying to reach those in need of basic medical treatment and health services regardless of race, religion and nationality. DWW reaches each part of the world to heal the wounds where there is a calamity, war, or poverty. DWW also carries out projects for medical aid including building well equipped hospitals, medical centers and nutrition health centers (20,21).

Our aim was to evaluate, and report the experiences of the volunteer surgical team of DWW Turkey during their medical activities in the Butambala and Kampala districts of Uganda, between 3-8 February 2015.

MATERIALS AND METHODS

The humanitarian health aid service, presented as the subject of this research, was carried out under

Table 1. Descriptive statistics of gender

Gender	Male		Female		Total	
	N (count)	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*
	98	*85.2*	*17*	*14.8*	*115*	*100*

Table 2. Descriptive statistics of age

Age	Male		Female		Total	
	Mean	*Min-Max*	*Mean*	*Min-Max*	*Mean*	*Min-Max*
	41.3	3-84	34.3	4-60	40.3	3-84

Table 3. Descriptive statistics of HIV positive and negatif patients

HIV	Positive		Negative		Total	
	N (count)	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*
	3	2.6	112	97.4	**115**	**100**

the permission, and approval of the Turkish Ministry of Health, Turkish Collaboration and Coordination Agency (TIKA), Doctors Worldwide (DWW), Ugandan Medical & Dental Practitioners Council (UMDPC), and Ugandan Ministry of Health. The coordinators of Gombe Hospital in Butambala, and Kibuli Hospital in Kampala sensitized the community, and other political leaders and government officials. The planned surgical camp was advertised locally and in the national media (22). Verbal information about the surgery and complications was given to, and signed informed consent forms were obtained from all patients.

The Butambala and Kampala districts of Uganda were the defined areas for the surgical camp to be organized between 3-8 February 2015. With a capacity of over 150 beds, the Kibuli Hospital is one of the largest healthcare hospitals in Kampala, and is among the best hospitals in Uganda. Gombe General Hospital is the district hospital for Butambala, and it is a 100-bed-hospital in the rural setting with a catchment area of about six districts including Mityana, Gomba, Mpigi, parts of Kalungu, and Wakiso districts. Both hospitals are under dependency of the Ugandan Ministry of Health.

The surgical camp was intended to conduct herniorrhaphies for all forms of hernias except the 11 operations for hydrocele. Totally 115 patients were elected for surgery. All patients were tested for HIV prior to surgery.

Screening of the patients was done first by the local medical teams and later by the visiting DWW Turkey Surgical Team. The DWW Turkey Surgical Team was comprised of three general surgeons, two anesthesiologists, and two operating room nurses.

All operations were performed throughout each day from the morning till the evening. Preoperative rounds were done daily early in the mornings whereas postoperative and discharge rounds were done daily, in the evenings. Gombe and Kibuli Hospitals' main theaters (utilizing two operating rooms at each hospital) were the site of all operations.

The patients' postoperative follow-up was maintained by local physicians, and the members of DWW Turkey Surgical Team. Surgical interventions were performed under either local, spinal, or general anesthesia.

Outcomes obtained as results of all surgical practices, including the demographic data of the patients (i.e. age, sex, etc.), the types of anesthetic procedures, and the types of surgical interventions performed were recorded. At the end of the surgical camp, the data was analyzed by MS Office Excel 2013.

RESULTS

The study group consisted of 61 (53.0%) patients who were treated in Kibuli Hospital, and 54 (47.0%) patients in Gombe Hospital.

One-hundred-and-fifteen patients, 17 (14.8%) of whom were women, and 98 (85.2%) of whom were men, were operated on (**Table 1**). The mean age of the female patients was 34.3 (4-60), while the mean age of the male patients was 41.3 (3-84), and the mean age of the total study group was 40.3 (3-84) (**Table 2**). Human immunodeficiency virus (HIV) positivity was detected in three (2.6%) patients among the total of 115 patients of the entire study group (**Table 3**).

There were 104 (90.4%) hernia patients totally. The most common diagnosis was inguinal hernia with 80 (69.6%) patients. In the inguinal hernia group, posterior wall darn hernia repair was carried out in 69 (60.0%) cases, and Lichtenstein mesh repair was performed in 11 (9.6%) cases. Umbilical hernia was detected in 15 (13.0%) patients. Sutured hernia repair with use of the Mayo technique was performed in 14 (12.2%) of these cases, while one (0.9%) case in the umbilical hernia group underwent a mesh repair. Nine (7.8%) patients were determined to possess epigastric hernia, all of

whom underwent sutured Mayo repair, as well. Additionally, 11 (9.6%) patients underwent Winkelmann's operation with the diagnosis of hydrocele (**Table 4**).

Spinal anesthesia was performed for the operations of 85 (73.9%) patients, while 25 (21.7%) cases were operated on under general anesthesia. Local anesthesia was administered in 5 (4.4%) patients prior to their surgical interventions (**Table 5**).

Postoperative surgical complications were met in 10 (8.7%) patients. Early postoperative hematoma developed in five (4.3%) patients, while seroma was detected in four (3.5%) patients, and surgical site infection developed in one (0.9%) patient (**Table 6**). All complications were successfully treated with meticulous wound management.

No postoperative mortality took place at the end of all operations.

DISCUSSION

Surgically treatable diseases are among the top 15 causes of disability, and conditions that can be treated with surgery account for 15% of the world's disability adjusted life years (23). Difficulties in access to surgical services results in excess morbidity and mortality in low and middle income countries, especially sub-Saharan Africa (12). The global volume of surgery is more than 200 million surgical procedures per year, and there is significant inequality between procedures performed in high-income and low-income countries (12,24). It has been reported that, of the 243 million surgical procedures performed globally each year, 34.8% of the world's population living in low-income countries only has access to 8.1 million (3.5%) of such procedures (25,26). Of these procedures, only a quarter are performed in low- and middle-income countries where nearly three-quarters of the world's population lives. As a result, minor surgical conditions become lethal in poor countries due to the timing of treatment, complications, poor post-operative care, and poor surgical outcome (12).

In many parts of the world, especially low-income countries, surgical procedures are done by poorly trained surgeons or physicians. The term "surgically trained provider" rather than surgeon is considered to be more appropriate for these workers (2). For example, in Uganda more than 5000 surgical procedures were performed by physicians in a year (27). Non-specialist practitioners were needed to be trained to perform surgery for basic operations because of the high frequency of surgical conditions, such as hernias in Africa. Some organizations which are governmental or NGOs perform humanitarian surgery and training programs and these kind of programs are important to close the gap between low and middle income countries even for a short time (28).

Inguinal hernia is still the most commonly seen surgical condition in the outpatient departments of hospitals in Uganda and in most African countries. Inguinal hernia occurs in adults in Africa approxi-

Table 4. Diagnoses of the patients who are operated on.

Surgical diagnoses	Inguinal Hernia		Umbilical hernia		Epigastric hernia		Subtotal (Hernia)		Hydrocele		Total	
	N (count)	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*
	80	69.6	15	13.0	9	7.8	104	90.4	11	9.6	**115**	**100**

Table 5. The type anesthesia used.

Anesthesia	Spinal		General		Local		Total	
	N (count)	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*
	85	73.9	25	21.7	5	4.4	**115**	**100**

Table 6. Complications.

Complications	Hematoma		Seroma		Wound infection		Total	
	N (count)	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*	*N (count)*	*Percent (%)*
	5	4.3	4	3.5	1	0.9	**10**	**8.7**

mately ten times more often, and it eventually converts to big neglected scrotal hernias (29). There are limited reports on the outcomes of inguinal hernia repairs in Africa. There is a vast unmet need for hernia surgery in Uganda. Almost all reports from sub-Saharan Africa showed that a large proportion of inguinal hernias in adults present to hospital as emergencies (24). In Uganda the ratio for emergency hernia repair is about 76% (6). In Mulago Hospital, emergency hernia operations constitute 68% of the inguinal hernia surgery performed (30). A similar situation is prevalent in Ghana, where only 1 out of 5 patients who require surgery are actually operated (31).

One-hundred-and-fifteen cases, 98 (85.2%) of whom were men and 17 (14.8%) of whom were women, were operated on among patients who underwent physical examinations following the announcements. One-hundred-and-four (90.4%) operations were performed for hernia, whereas the remaining 11 (9.6%) were carried out for hydrocele. In the present study, in the inguinal hernia group of 80 (69.6%) patients, sutured wall darn hernia repair was carried out in 69 (60.0%) cases, and Lichtenstein mesh repair was performed in 11 (9.6%) cases. Wall darn hernia repair is a cheap, and easy surgical technique. Additionally, sutured Mayo repair was performed in 14 (12.2%) umbilical hernia cases, while one (0.9%) case in the umbilical hernia group underwent a mesh repair. Nine (7.8%) patients who were determined to possess epigastric hernia underwent sutured Mayo repair, as well.

Adesunkanmi et al reported the factors that affected the outcomes of inguinal hernia operations in Nigeria (32). A number of postoperative complications were documented including scrotal complications such as edema, hematoma, infection and necrosis. Wound infection and dehiscence were frequent complications as well (32). Postoperative outpatient attendance was poor as 298 patients were lost at the follow-ups in the postoperative sixth month, and only 17 patients attended the outpatient follow-ups for more than 2-5 years. Although the recurrence rate was 4%, this finding is unlikely to be reliable. The length of hospital stay and the duration for the patients to return to daily life was four days in elective, and seven days after emergency operations (32). As pointed out in this study, the common factor for poor surgical outcomes is the underlying tissue weakness resulting from long periods of attenuation due to longstanding, enlarged hernias. This subject proves the severity of the inguinal hernia disease in Africa. In the long-term follow-up period, chronic groin pain and recurrence are the most important issues (32).

In the present study, postoperative surgical complications were met in 10 (8.7%) cases among the entire study group of 115 patients. There were no intra-operative complications. Early postoperative hematoma developed in five patients (4.3%), while seroma was detected in four (3.5%), and surgical site infection developed in one (0.9%) patient. All complications were successfully treated with meticulous wound management, and no postoperative mortality took place at the end of all operations.

Although this is not a prevalence study, we believe that this report carries importance as it throws a light upon the literature by reflecting information about the management as well as intra- and postoperative complications of surgical diseases such as hernia in low-income regions including Africa. Additionally, the presence of a strong demand in response to the announcements via local media of the small districts of such countries, proves the need for hernia surgery squads in these regions within the scope of continuous global surgery and humanitarian aid programs. Surgical programs at WHO are rapidly evolving due to increasing awareness of the fact that surgical conditions are important public health problems, and also due to realizing that surgery is an efficacious and cost-effective field of health services (23). Improving access to surgical care in low-income countries requires addressing paucities in training and skills of personnel, appropriate equipment, medications, and infrastructure (26).

CONCLUSION

Our Surgical Team carried out successful surgical interventions in Uganda resulting with definitive therapeutic outcomes for curable surgical etiologies. We conclude that, as an efficacious modality of treatment, surgery should always be considered as one of the most important priorities when conducting humanitarian health aid programs.

REFERENCES

1. Riviello R, Ozgediz D, Hsia RY, Azzie G, Newton M, Tarpley J. Role of collaborative academic partnerships in surgical training, education, and provision. World J Surg. 2010;34(3):459-65.
2. Bickler S, Ozgediz D, Gosselin R, Weiser T, Spiegel D, Hsia R, et al. Key concepts for estimating the burden of surgical conditions and the unmet need for surgical care. World J Surg. 2010;34(3):374-80.
3. Funk LM, Weiser TG, Berry WR, Lipsitz SR, Merry AF, Enright AC, et al. Global operating theatre distribution and pulse oximetry supply: an estimation from reported data. Lancet. 2010;376(9746):1055-61.
4. Gawande A. Global surgery. Lancet. 2015;386(9993):523-25.
5. Yang J, Papandria D, Rhee D, Perry H, Abdullah F. Low-cost mesh for inguinal hernia repair in resource-limited settings. Hernia. 2011;15(5):485-89.
6. Ohene-Yeboah M, Abantanga FA. Inguinal hernia disease in Africa: a common but neglected surgical condition. West Afr J Med. 2011;30(2):77-83.
7. Robert JF, Forse RA. Groin hernias in adults. N Engl J Med. 2015;372(8):756-63.
8. Wilhelm TJ, Anemana S, Kyamanywa P, Rennie J, Post S, Freudenberg S. Anaesthesia for elective inguinal hernia repair in rural Ghana – appeal for local anaesthesia in resource-poor countries. Trop Doct. 2006;36(3):147-49.
9. Yordanov YS, Stoyanov SK. The incidence of hernia on the island of Pemba. East Afr Med J. 1969;46(12):687-91.
10. 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(3):498-503.
11. Mock C, Cherian M, Juillard C, Donkor P, Bickler S, Jamison D, McQueen K. Developing priorities for addressing surgical conditions globally: furthering the link between surgery and public health policy. World J Surg. 2010;34(3):381-85.
12. Löfgren J. Groin hernias and unmet need for surgery in Uganda: epidemiology, mosquito nets and cost-effectiveness [doktoral thesis]. Umeå: Umeå University; 2015.
13. Bay-Nielsen M, Kehlet H, Strand L, et al. Quality assessment of 26,304 herniorrhaphies in Denmark: a prospective nationwide study. Lancet. 2001;358(9288):1124-28.
14. David C Brooks. uptodate.com [Internet]. [Updated: 15 December 2014, cited: December 2015]. Available from http://www.uptodate.com/contents/overview-of-treatment-for-inguinal-and-femoral-hernia-in-adult
15. Nilsson H, Nilsson E, Angerås U, Nordin P. Mortality after groin hernia surgery: delay of treatment and cause of death. Hernia. 2011;15(3):301-7.
16. data.worldbank.org [Internet]. Available from http://data.worldbank.org/country/uganda
17. Linden AF, Sekidde FS, Galukande M, Knowlton LM, Chackungal S, McQueen KA. Challenges of surgery in developing countries: a survey of surgical and anesthesia capacity in Uganda's public hospitals. World J Surg. 2012;36(5):1056-65.
18. Löfgren J, Makumbi F, Galiwango E, Nordin P, Ibingira C, Forsberg BC, Wladis A. Prevalence of treated and untreated groin hernia in eastern Uganda. Br J Surg. 2014;101(6):728-34.
19. Kingsnorth AN. Hernia surgery: from guidelines to clinical practice. Ann R Coll Surg Engl. 2009;91(4):273-79.
20. Yeryüzü Doktorları [Internet]. Available from https://yyd.org.tr/tr
21. Doctors Worldwide [Internet]. Available from http://www.doctorsworldwide.org
22. The Islamic University in Uganda [Internet]. Available from https://www.iuiu.ac.ug/home/indexGo.php page=Events&i=65
23. Farmer PE, Kim JY. Surgery and global health: a view from beyond the OR. World J Surg. 2008; 32(4):533-6.
24. Penoyar T, Cohen H, Kibatala P, Magoda A, Saguti G, Noel L, et al. Emergency and surgery services of primary hospitals in United Republic of Tanzania. BMJ Open. 2012;2:e000369.
25. Weiser TG, Regenbogen SE, Thompson KD, Haynes AB, Lipsitz SR, Berry WR, et al. An estimation of the global volume of surgery: a modelling strategy based on available data. Lancet. 2008;372(9633):139-44.
26. Elkheir N, Sharma A, Cherian M, Saleh OA, Everard M, Popal GR, et al. A cross-sectional survey of essential surgical capacity in Somalia. BMJ Open. 2014;4:e004360.
27. Ozgediz D, Galukande M, Mabweijano J, Kijjambu S, Mijumbi C, Dubowitz G, et al. The neglect of the global surgical workforce: experience and evidence from Uganda. World J Surg. 2008;32(6):1208-15.
28. Hollaar G, Namuyaga M, Fualal J, Lett R. Structured hernia training — a pilot project. East Cent Afr J Surg. 2004;9:12-17.
29. Nordberg EM. Incidence and estimated need of caesarean section, inguinal hernia repair and operation for strangulated hernia in rural Africa. Br Med J. 1984;289(6437):92-93.
30. Odula PO, Kakande I. Groin hernia in Mulago Hospital, Kampala. East Central Afr J Surg. 2004; 9:48-52.
31. Manyilirah W, Kijjambu S, Upoki A, Kiryabwire J. Comparison of non-mesh (Desarda) and mesh (Lichtenstein) methods for inguinal hernia repair among black African patients: a short-term double-blind RCT. Hernia. 2012;16(2):133-44.
32. Adesunkanmi AR, Agbakwuru EA, Badmus TA. Obstructed abdominal hernia at the Wesley Guild Hospital, Nigeria. East Afr Med J. 2000;77(1):31-33.