Published in final edited form as:

J Surg Res. 2019 June ; 238: 90–95. doi:10.1016/j.jss.2019.01.040.

Antibiotics for groin hernia repair according to evidence-based guidelines: Time for action in Ghana

Adam Gyedu, MD MPH,

Department of Surgery; School of Medical Sciences; Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, University Hospital, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Micah Katz, MD,

Department of Surgery; University of Utah, Salt lake City, UT, USA, micahgkatz@gmail.com

Kwabena Agbedinu, MBChB,

Directorate of Surgery; Komfo Anokye Teaching Hospital, Kumasi, Ghana, agbeyepapa@yahoo.com

Peter Donkor, MDsc, and

Department of Surgery; School of Medical Sciences; Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, petadonkor@yahoo.com

Charles Mock, MD PhD

Harborview Injury Prevention & Research Center, Seattle, WA, USA, Department of Surgery, University of Washington, Seattle, WA, USA, cmock@uw.edu

Abstract

Introduction—Groin hernia repairs (GHR), though classified as clean surgeries, are associated with varying rates of surgical site infections (SSI). We assessed the practices of surgeons in Ghana regarding antibiotic use for GHR in comparison to evidence-based international guidelines (EBIG).

Methods—We interviewed surgeons trained by the Ghana College of Physicians and Surgeons (GCPS), from inception (2003) through 2016, about their use of antibiotics for GHR. We defined

Corresponding author Adam Gyedu, MD MPH, Department of Surgery; School of Medical Sciences; Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, University Hospital, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, drgyedu@gmail.com.

Authors' contributions

Study concept and design: Gyedu, Donkor, Mock

Acquisition, analysis, or interpretation of data: Gyedu, Agbedinu, Katz

Drafting of the manuscript: All authors

Critical revision of the manuscript for important intellectual content: All authors

Administrative, technical, or material support: All authors

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conflicts of interest: The authors declare no competing interest in any form related directly or indirectly to the subject of this article.

the outcome variable of consistently following EBIG in antibiotics use for GHR. Logistic regression was used to examine how *a priori* selected covariates contributed to the outcome.

Results—Eighty-two of 117 surgeons reported performing/supervising at least one GHR per week. They performed/supervised a mean of five GHR per week. Thirty-two (40%) reported using mesh for at least 50% of GHR. For primary GHR, 75% of surgeons administered antibiotics according to EBIG, while for GHR with mesh only 45% did so. Predictors of consistently following EBIG were increasing number of GHR performed per week (AOR 1.44, 95%CI 1.07–1.96) and increasing time spent for clinical work (AOR 0.95, 95%CI 0.91–0.99). Years of practice since GCPS graduation, total operations performed/week, and hospital-level of practice were not predictive of the outcome variable.

Conclusion—Two-thirds of Ghanaian surgeons interviewed do not consistently administer antibiotics for GHR per EBIG, raising the need to improve access to evidence-based medical information overall to guide practice. Determining local SSI rates to guide antibiotic use in GHR will be useful in Ghana and other LMICs.

Keywords

Antibiotics; Groin hernia repair; Ghana; Low- and middle-income country

Introduction

Groin hernia repairs are among the most common and cost-effective surgical procedures performed worldwide (1). Limited surgical capacity in low- and middle-income countries (LMICs) has led to an unmet need for groin hernia repairs in these settings (2–4). Access to safe, effective groin hernia surgery should be prioritized because of the large unmet need, but additionally because surgical repair is highly successful, and the procedure is cost-effective (5).

Groin hernia repairs are generally classified as clean cases (6, 7), but rates of surgical site infection (SSI) following hernia surgery range from as low as 0.1% (8) to exceeding 10% (9, 10). The consequence of SSI after surgery can be devastating for the patient and might lead to hernia recurrence or necessitate removal of a previously implanted mesh (9).

Several guidelines exist on the use of antibiotics for groin hernia repair, especially when mesh is used. While some guidelines recommend preoperative (prophylactic) antibiotics (11), others conditionally recommend them (6, 12), while others generally discourage their use (13–15). Additionally, there appears to be no recommendations for antibiotic use for primary repair of groin hernia (without use of a mesh).

The annual incidence of groin hernias requiring surgery in Ghana is estimated at 210 per 100,000 population (4). However, the rates of repair are estimated to be between 30 – 56 per 100,000 population per year, confirming a large unmet need (4, 16). As groups build capacity to address this unmet need, the practice of evidence-based guidelines should be promoted. The practices of surgeons in Ghana regarding groin hernia repairs are largely unknown. We assessed the perceptions and practices of surgeons in Ghana regarding the use of antibiotics for groin hernia repairs. We aimed to describe the current practices in relation

to evidence-based international guidelines and identify predictors of evidence-based practices. By so doing, we hoped to deepen awareness about responsible antibiotic use in the context of groin hernia repairs in Ghana and other LMICs.

Methods

Setting

Ghana is a lower-middle income West African country with a population of 26 million. Hospital-based surgical care is organized at three levels: district (first-level), regional (referral) and tertiary hospitals. The Ghana College of Physician and Surgeons (GCPS) provides in-country surgical training. Trainees receive membership certification on successful completion of three years of supervised training that allows them to practice as independent specialist surgeons with a broad range of skills. They can also choose to have further training for an additional 2–3 years after which they are awarded with a fellowship certificate in their preferred sub-specialty. The present study was nested in a larger study that sought to assess the impact of GCPS in-country training of surgeons (17).

Participants

All 146 surgical graduates of the GCPS since inception in 2003 until December 31, 2016 were eligible for the study. Their contact information was collected from GCPS records. After establishing contact, those who consented to participate in the study were surveyed by face-to-face or phone interviews, or by self-administration.

Survey

The survey was conducted from June 10 to July 20, 2017 with a structured questionnaire. Information on participant demographics, GCPS training, years of practice since GCPS graduation, hospital of current practice, percentage of work time devoted to clinical work vs research/teaching, total number of surgical procedures performed, and the number of groin hernia repairs performed/supervised were collected. Respondents were also asked about their use of mesh in groin hernia repairs as well as their use of antibiotics for groin hernia repairs. Reasons for their use of mesh or for prescribing antibiotics were sought through open-ended questions and respondents were allowed to provide multiple responses.

Data Analysis

Analyses were conducted with Stata v14 (StataCorp, College Station, TX) and expressed as descriptive statistics. We defined the outcome variable of consistently following evidence-based international guidelines in the use of antibiotics for groin hernia repair by using a conservative interpretation of evidence-based international guidelines and practices (6, 7, 10–15, 18–22). For both primary and mesh repair, we labeled either no antibiotic or preoperative antibiotic use as being acceptable. The use of postoperative antibiotics, either in combination with preoperative antibiotics or alone, was deemed not consistent with evidence-based guidelines (Table 1). Multivariate logistic regression was used to examine how *a priori* selected covariates contributed to the outcome variable. These included the number of years since a surgeon graduated from GCPS training, the average number of groin hernias a surgeon performed/supervised per week, the total number of operations a surgeon

performed per week, the percentage of time the surgeon spent for clinical work, and hospital level of practice. There was no multicollinearity between covariates.

Ethical approval

Data were gathered anonymously. Approval for the study was granted by Kwame Nkrumah University of Science and Technology Committee for Human Research and Publication Ethics.

Results

Of 146 surgeons eligible for the study, 117 were surveyed, and 82 reported performing/supervising at least one groin hernia repair per week. The average respondent was 39 years old, male, with 4 years of surgical practice since graduation from membership training at the GCPS (Table 2). Most respondents (62%) worked in a tertiary-level hospital, spending a mean of 69% of their time in clinical practice, and performing a mean of 13 surgeries per week. They performed/supervised a mean of five groin hernia repairs per week. Twenty-three (28%) reported not using mesh for hernia repairs, while 32 (40%) reported using a mesh at least 50% of the time. Polypropylene was the most common (92%) mesh material used (Table 2). When deciding to use mesh, the most important factors considered were affordability of the mesh (32%), recurrence (23%), hernia size (13%), elective cases (9%), issues of anatomy (7%), mesh availability (6%), concern for SSI (5%), and patient factors such as age or preference (5%).

When groin hernia repair was performed without mesh, the majority (62%) of GCPS-trained surgeons reported not administering preoperative or postoperative antibiotics. Thirteen percent reported administering preoperative antibiotics only, 10% reported giving postoperative antibiotics only, and 15% reported giving pre- and postoperative antibiotics. Table 3 lists the rationale for use or avoidance of antibiotics, with concern for infection being most commonly cited. When mesh was used, 53% of surgeons reported using pre- and postoperative antibiotics, 39% reported using preoperative antibiotics only, 6% reported using no antibiotics, and 2% reported only postoperative antibiotic use. Concern for infection was the most common reported reason for antibiotic use.

On multivariate analysis, a positive predictor of consistently following evidence-based international guidelines was increasing number of groin hernia repairs performed per week (AOR 1.44, 95% CI 1.07 – 1.96) (Table 4). Increasing percent time spent on clinical work was a negative predictor (AOR 0.95, 95% CI 0.91 – 0.99). Number of years since GCPS membership graduation, total number of operations performed per week, and hospital level of practice did not predict which surgeons consistently followed evidence-based international guidelines.

Discussion

Groin hernia repair is one of the most common surgical procedures performed and, in the event of an SSI occurring in the presence of mesh, contamination of the foreign body can be devastating for patients (9). Therefore the prevention of SSI is a priority and evidence-based

decisions should be sought and consistently practiced. Worsening antibiotic resistance is another consideration and of special concern for LMICs where rates of resistance may be increased (23). This highlights the need for rational use of antibiotics in such countries. We assessed the current perceptions and practices of surgeons in Ghana regarding the use of antibiotics for groin hernia repairs in relation to evidence-based international guidelines. Twenty-five percent of our respondents reported practices inconsistent with evidence-based international guidelines for primary groin hernia repair while 55% reported same for mesh repairs.

The use of preoperative antibiotics for the prevention of SSI before groin hernia repair with mesh is controversial. A 2012 Cochrane review assessed 17 randomized trials, of which 13 concluded that antibiotic prophylaxis is not efficacious, while 4 supported their use (7). It is therefore not surprising that guidelines from hernia societies make conflicting recommendations. Disparate evidence about the benefits of systemic antibiotic prophylaxis may be explained by incongruent environmental and patient risk factors.

Authors of the HerniaSurge Guidelines found no reduction in SSI when preoperative antibiotics were given before groin hernia repairs performed in low-risk environments (defined as SSI rate <5%) (6). In studies conducted in high-risk environments (SSI rate >5%), however, the rate of SSI was reduced after antibiotic prophylaxis. The HerniaSurge group, therefore, recommends against the use of antibiotic prophylaxis in average-risk patients in low-risk environments, but for their use in high-risk environments. Similar recommendations are made by the European Hernia Society (12). Published rates of SSI after groin hernia surgery in Ghana range from 1 – 3% (24–26), suggesting a low-risk environment. These studies, however, come from outreach programs and the rate of SSI in standard Ghanaian practice is unknown. Compliance with evidence-based guidelines will be helped by measurement of local outcomes after groin hernia repairs, which will inform tailoring of antibiotic use to local SSI rates.

There is also lack of clear consensus on the definition of patients at high risk for SSI after groin hernia repair. Suggested patient-specific risk factors include bilateral repairs (6, 12), recurrent hernia repairs (6, 12), advanced age (12, 27), obesity (12, 27), presence of a urinary catheter (27), immunosuppressive conditions (12), expected long operating times (12), and the use of drains (12). This has led to some groups promoting weak recommendations for preoperative antibiotic use in high-risk patients (6, 12, 14).

There appears to be no studies or recommendations focusing on postoperative antibiotics for the purpose of preventing SSI after groin hernia repair. The World Health Organization broadly recommends against prolongation of antibiotic prophylaxis for the purpose of preventing SSI (18). This recommendation is based on 44 RCTs, including 7 focused on mixed general surgical cases. Other groups specifically recommend using preoperative antibiotics only (15, 19, 22) and no recommendations are made to prolong antibiotics beyond 24 hours after surgery (11, 21, 28). Therefore the use of postoperative antibiotics is not consistent with existing data or guidelines.

For primary hernia repair, there are no studies or recommendations that address whether preoperative antibiotic should be considered. Without the insertion of a foreign body the National Institute for Health and Care Excellence (NICE) Guidelines recommend against preoperative antibiotics for clean, non-prosthetic uncomplicated surgery (20). However the groin may be particularly prone to infection with rates of SSI exceeding those from other clean cases, as demonstrated by an 8.7% SSI rate in high-risk environments (6), and rates higher than 10% in some settings (9, 10). The benefit of administering preoperative antibiotics for groin hernia repair has only been shown to reduce superficial infection, while reduction in deep infections have not been demonstrated (12, 29). Therefore it is reasonable to follow the same recommendations whether mesh is used or not: preoperative antibiotics in high-risk environments, none in low-risk environments.

A significant proportion of our respondents reported practices inconsistent with antibiotic prescription guidelines for groin hernia repairs. Their most common reason was concern for SSI, for which the benefit of postoperative antibiotics has not been demonstrated (18). These concerns for SSI were mostly determined preoperatively because of perceived poor patient hygiene or concerns about maintenance of the aseptic technique. This mostly informed respondents' use of preoperative antibiotics in such situations, majority of whom also added postoperative antibiotics. We believe that there are more appropriate ways of dealing with these concerns, including encouraging patients to bathe before surgery and promoting strict adherence to aseptic principles by the operating team, rather than resorting to antibiotics. The risk of administering unnecessary antibiotics is well-characterized, however, and include patient allergies, bacterial resistance, cost, and *C. difficile* infection (6). The recent HerniaSurge recommendations (6) have standardized the recommendations across different groups, and is welcomed. Clear guidelines and improved education among Ghanaian surgeons may decrease the use of unnecessary postoperative antibiotics after groin hernia repair.

Among the participants of the survey, the number of groin hernia surgeries performed/supervised per week was positively correlated with practice consistent with guidelines. It is reasonable that surgeons with higher volume may be more familiar with guidelines. Interestingly, increasing time spent on clinical work was a negative predictor for guideline-consistent practice. The survey asked surgeons what percent of their time was spent in clinical work vs teaching/research. We hypothesize that these scholarly activities, especially teaching, encourages surgeons to stay up to date with studies and guidelines, reflected by their perioperative antibiotic preferences. However, we concede that spending more time doing clinical work may not necessarily imply performing/supervising more groin hernia operations. No other factor studied predicted which surgeons consistently use antibiotics according to guidelines. Therefore, all Ghanaian surgeons should be targeted for education regarding appropriate antibiotic use during groin hernia repair, with special attention to those with lower volumes and those not involved in teaching/research.

Before drawing conclusions, limitations of the study must be addressed. Firstly, only 80% (117/146) of the GCPS-trained surgeons responded to the larger survey. Of these, 82 (70%) responded to the hernia-specific survey, with others stating that they no longer performed groin hernia surgery. Groin hernia repair in Ghana is not exclusive to our respondents and

includes surgeons not trained by the GCPS, and non-surgeon physicians who operate under or without supervision of fully-trained surgeons. However, the reported practices by our respondents likely reflect the culture of antibiotic use within the country. Secondly, the survey is limited to the surgeons' reported practices, which could not be verified. Thirdly, we did not specifically ask about respondents' antibiotic practices if they encountered incarcerated or strangulated bowel. However, there were 9 responses of "complicated hernia" – which we believe might include incarceration and/or strangulation – given as a reason for administering, especially, postoperative antibiotics. Finally, our survey did not examine exposure to or understanding of evidence regarding antibiotics for groin hernia repair. However, in an assessment of access to and use of evidence-based medical information, Ghanaian surgeons reported having poor access to database search platforms, point-of-care tools, and international practice guidelines (30). They, however, believed that reading and applying literature improved patient care.

Conclusion

Two-thirds of Ghanaian surgeons surveyed do not consistently administer antibiotics for groin hernia repairs according to evidence-based international guidelines. This raises the need to improve access to evidence-based medical information overall to guide practice. More importantly, determination of local SSI rates to guide establishment of local evidence-based guidelines for antibiotic use in groin hernia repairs will be useful in Ghana and other LMICs.

Acknowledgments:

The authors wish to thank all the surgeons who participated in the study and Stephanie K. Goodman for assistance with data analysis

Grant support: This study was funded in part by a grant D43TW007267 from the Fogarty International Center, US National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

References

1. Kingsnorth A, Hernias LeBlanc K: inguinal and incisional. *Lancet* 2003;362:1561–1571. [PubMed: 14615114]
2. Galukande M, von Schreeb J, Wladis A, Mbembati N, de Miranda H, et al. Essential surgery at the district hospital: a retrospective descriptive analysis in three African countries. *PLoS medicine* 2010;7:e1000243. [PubMed: 20231871]
3. Stewart BT, Pathak J, Gupta S, Shrestha S, Groen RS, et al. An estimate of hernia prevalence in Nepal from a countrywide community survey. *International journal of surgery* 2015;13:111–114. [PubMed: 25500564]
4. 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 journal of surgery* 2013;37:498–503. [PubMed: 23224074]
5. Mock C, Cherian M, Juillard C, Donkor P, Bickler S, et al. Developing priorities for addressing surgical conditions globally: furthering the link between surgery and public health policy. *World journal of surgery* 2010;34:381–385. [PubMed: 19876689]
6. HerniaSurge G International guidelines for groin hernia management. *Hernia : the journal of hernias and abdominal wall surgery* 2018;22:1–165.

7. Sanchez-Manuel FJ, Lozano-Garcia J, Seco-Gil JL Antibiotic prophylaxis for hernia repair. The Cochrane database of systematic reviews 2012:CD003769. [PubMed: 22336793]
8. Rutkow IM, Robbins AW “Tension-free” inguinal herniorrhaphy: a preliminary report on the “mesh plug” technique. Surgery 1993;114:3–8. [PubMed: 8356522]
9. Bailey IS, Karran SE, Toyn K, Brough P, Ranaboldo C, et al. Community surveillance of complications after hernia surgery. Bmj 1992;304:469–471. [PubMed: 1547415]
10. Othman I Prospective randomized evaluation of prophylactic antibiotic usage in patients undergoing tension free inguinal hernioplasty. Hernia : the journal of hernias and abdominal wall surgery 2011;15:309–313. [PubMed: 21259031]
11. Bratzler DW, Dellinger EP, Olsen KM, Perl TM, Auwaerter PG, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. American journal of health-system pharmacy : AJHP : official journal of the American Society of Health-System Pharmacists 2013;70:195–283. [PubMed: 23327981]
12. Simons MP, Aufenacker T, Bay-Nielsen M, Bouillot JL, Campanelli G, et al. European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. Hernia : the journal of hernias and abdominal wall surgery 2009;13:343–403. [PubMed: 19636493]
13. Rosenberg J, Bisgaard T, Kehlet H, Wara P, Asmussen T, et al. Danish Hernia Database recommendations for the management of inguinal and femoral hernia in adults. Danish medical bulletin 2011;58:C4243. [PubMed: 21299930]
14. Groin Hernia Surgery Guidance Development Group Groin Hernia Guidelines. Issues in Professional Practice London: British Hernia Society, 2016.
15. Scottish Intercollegiate Guidelines Network Antibiotic prophylaxis in surgery Edinburgh: Scottish Intercollegiate Guidelines Network (SIGN), 2014.
16. Gyedu A, Stewart B, Gaskill C, Boakye G, Appiah-Denkyira E, et al. Improving Benchmarks for Global Surgery: Nationwide Enumeration of Operations Performed in Ghana. Ann Surg 2017;268:282–288.
17. Gyedu A, Debrah S, Agbedinu K, Goodman SK, Plange-Rhule J, et al. In-Country Training by the Ghana College of Physicians and Surgeons: An Initiative that has Aided Surgeon Retention and Distribution in Ghana. World journal of surgery 2018.
18. Group WGS Global Guidelines for the Prevention of Surgical Site Infection. Global Guidelines for the Prevention of Surgical Site Infection Geneva: 2016.
19. Leaper D, Burman-Roy S, Palanca A, Cullen K, Worster D, et al. Prevention and treatment of surgical site infection: summary of NICE guidance. Bmj 2008;337:a1924. [PubMed: 18957455]
20. National Institute for Health and Care Excellence: NICE Surgical site infections: prevention and treatment National Institute for Health and Care Excellence: NICE, 2008.
21. Royal College of Surgeons in Ireland Working Group Preventing surgical site infections: Key recommendations for practice Dublin: Joint Royal College of Surgeons in Ireland/Royal College of Physicians of Ireland Working Group on Prevention of Surgical Site Infection 2012.
22. UK High Impact Intervention Bundle Care bundle to prevent surgical site infection London: Department of Health 2011.
23. GlobalSurg C Surgical site infection after gastrointestinal surgery in high-income, middle-income, and low-income countries: a prospective, international, multicentre cohort study. The Lancet Infectious diseases 2018.
24. Yenli EMT, Abanga J, Tabiri S, Kpangkpatri S, Tigwii A, et al. Our Experience with the Use of Low Cost Mesh in Tension-Free Inguinal Hernioplasty in Northern Ghana. Ghana Med J 2017;51:78–82. [PubMed: 28955103]
25. Mitura K, Koziel S, Pasierbek M Groin hernia surgery in northern Ghana--humanitarian mission of Polish surgeons in Tamale. Polski przegląd chirurgiczny 2015;87:16–21. [PubMed: 25803064]
26. Shillcutt SD, Clarke MG, Kingsnorth AN Cost-effectiveness of groin hernia surgery in the Western Region of Ghana. Archives of surgery 2010;145:954–961. [PubMed: 20956763]
27. Pessaux P, Lermite E, Blezel E, Msika S, Hay JM, et al. Predictive risk score for infection after inguinal hernia repair. American journal of surgery 2006;192:165–171. [PubMed: 16860624]

28. Anderson DJ, Podgorny K, Berrios-Torres SI, Bratzler DW, Dellinger EP, et al. Strategies to prevent surgical site infections in acute care hospitals: 2014 update. *Infection control and hospital epidemiology* 2014;35 Suppl 2:S66–88. [PubMed: 25376070]
29. Yerdel MA, Akin EB, Dolalan S, Turkcpar AG, Pehlivan M, et al. Effect of single-dose prophylactic ampicillin and sulbactam on wound infection after tension-free inguinal hernia repair with polypropylene mesh: the randomized, double-blind, prospective trial. *Ann Surg* 2001;233:26–33. [PubMed: 11141221]
30. LaGrone LN, Fuhs AK, Egoavil EH, Langdale LA, Fuangworawong P, et al. A Global Assessment of Access to and Use of Medical Information: The State of Evidence-Based Surgery. *World journal of surgery* 2018;42:521–531. [PubMed: 28849256]

Table 1:

Administration of antibiotics based on evidence-based international guidelines and practices

	Primary repair	Mesh repair
No antibiotic use	+	+
Preoperative antibiotics only	+	+
Postop antibiotics only	–	–
Pre and postop antibiotics	–	–

(+): Consistent with evidence-based guidelines

(–): Not consistent with evidence-based guidelines

Table 2:

Demographics of surgeons participating in survey (N=82)

	Number	(%)
Background information		
Age of respondents; mean, (range)	39	(30–50)
Male	74	(90)
Years since membership graduation from GCPS; mean, (range)	4	(1–10)
College qualification		
Membership	47	(57)
Trainee fellow	29	(35)
Fellow	6	(7)
Hospital level of practice		
District level	40	(34)
Regional level	5	(4)
Tertiary level	72	(62)
Percent time spent for clinical practice; mean, (range)	69	(40–100)
Total surgeries performed/supervised per week; mean,(range)	13	(5–36)
Hernia surgery practice		
Number of hernia surgeries/ supervised per week; mean, (range)	5	(1–19)
Respondents who do not use mesh for hernia repair	23	(28)
Respondents who use mesh in 50% of repair	32	(39)
Type of mesh used		
Polypropylene	49	(92)
Composite mesh	3	(6)
Polyethylene	1	(2)

GCPS: Ghana College of Physicians and Surgeons

WACS: West African College of Surgeons

Table 3:

Reported practice and rationale for antibiotic use for groin hernia repair with or without mesh

	No antibiotic use	Preop antibiotics only	Postop antibiotics only	Pre- and postop antibiotics	Total
<i>Reported antibiotic use - repair without mesh</i>					
Clean surgery	2	0	0	0	2
Complicated hernia	4	2	2	1	9
Concern for infection	0	3	4	10	17
Elective	1	0	0	0	1
Immunocompromised	0	1	0	0	1
Prolong surgery	0	1	0	0	1
No response	37	2	1	0	40
Total	44	9	7	11	71
<i>Reported antibiotic use - repair with mesh</i>					
Comorbidity	0	1	0	0	1
Mesh is a foreign body	0	8	0	13	21
Concern for infection	0	14	1	17	32
Recurrent	0	0	0	1	1
No response	4	1	0	2	7
Total	4	24	1	33	62

Vertical axes denote the types of reported antibiotic practices.

Horizontal axes denote reasons advanced by respondents to explain their antibiotic practices.

Table 4:

Factors associated with surgeons' antibiotic use in groin hernia repair according to evidence-based guidelines.

	AOR	95% C.I
Years since GCPS membership graduation	0.72	0.50 – 1.07
No. groin hernia performed or supervised/week	1.44	1.07 – 1.96
Total no. operations performed/week	0.85	0.71 – 1.01
Percentage time spent for clinical work	0.95	0.91 – 0.99
Hospital level of practice		
District level	Referent	
Regional level	14.92	0.66 – 335
Tertiary level	5.12	0.91 – 28.69

AOR: Adjusted odds ratio