Research Article
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Indications of laparotomy and subsequent management in the presence of skilled surgeons in a rural and limited resource setting: a 3 years experience in Ruhengeri referral hospital, Rwanda

Abstract

Background: Laparotomy is a major, high risk intervention commonly done with therapeutic and for diagnostic purpose. Most of patients with abdominal surgical conditions do not get timely access to that intervention because of paucity of skilled physicians at district hospital for diagnosis and subsequently to intervention in the LMICs, which lead to high mortality and morbidity rate at high level hospitals. The aim of our study was retrospectively to identify the commonest surgical conditions which need laparotomy and their management in the rural areas at district hospital in the LIMCs.

Objective: To identify indications of laparotomy and subsequent management in the presence of skilled surgeons in a rural and limited setting Hospital.

Methods: This is a 3 years retrospective study done in the Ruhengeri referral hospital on the patients who underwent laparotomy in the department of surgery from September 2016 to August 2019 when two general surgeons were permanently present in the Hospital. Social demographic and clinical characteristics of operated patients have been analyzed including surgical interventions performed.

Results and discussion: In this study 232 patients underwent laparotomy for various reasons. The vast majority were between 21 and 30 years(35%) and above 65years (12.9%), most of them were men (M:F:2:1)., the common indication of surgery was small bowel obstruction (22,2%), followed by followed by hollow viscus perforation(Gastroduodenal and ileal perforation) at 21% and sigmoid volvulus (15,3%). The most common intervention done was Ileal resection + Primary end to end anastomosis (ETEA) at 22 % followed by sigmoidectomy and primary ETEA at 17.7%, then Perforation repair + wash out at 12,9 % and Appendectomy at 9% then others.

Conclusion: This study depicts the burden of surgical abdominal conditions in remote areas and proves that major emergency interventions can be done even in rural Hospitals if infrastructures and qualified human resources are available.

Keywords: surgical abdomen, laparotomy, bowel obstruction, hollow viscus perforation, rural hospitals

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Background

Laparotomy is usually performed on the patients with acute or unexplained abdominal pain, in the patient with abdominal mass and in some patients with abdominal trauma. It is done routinely mainly for curative and for diagnostic purpose in the patients with intrabdominal malignancies.[1] It is a common operation that is most frequently carried out with life-saving intent, but which nevertheless carries substantial mortality.[2,3] The early complications are paralytic ileus, Intra-abdominal collection or abscess, wound infections, abdominal wall dehiscence, pulmonary atelectasis, enterocutaneous fistulas, while late complications are adhesions, incisional hernia.[2,4,5] Delay in the decision making for emergency laparotomy is hazardous, the earlier diagnosis and intervention, the better the outcome. The abdominal surgical conditions geographically differ from one region to another.[6,7] Surgical interventions and outcome differ due to the different facilities, due to infrastructures, surgeon skills and patient conditions.[6,8] This makes it an important topic in its own right and a potential proxy for surgical care generally. Patients with low socio economic status, low level of education, who live in rural area are more exposed to the conditions which will need laparotomy.[3,5] In the LMICs three broad categories of barriers to access surgical care have been identified: structural aspects of health care, cultural beliefs and attitudes, and financial barriers. The structural barriers most commonly identified were lack of facilities, delay in accessing facilities due to transfer process, means of transport, limited knowledge of health workers for early diagnosis of surgical conditions which may need laparotomy especially at health center and majority of district hospitals. Facilities that were inaccessible, without surgeons or with poor infrastructures are also among structure barriers. Cultural barriers included a family role in decision making that was influenced by adverse attitudes and beliefs about available care.

The most frequently identified financial barriers were the cost of care and the indirect costs related to lost opportunity for work, finding a caretaker for their children, and the cost of bringing a caretaker with them.[6,9,10] In Rwanda and many other LMICs, major surgeries are done at the main referral hospitals which in most of the time require long transfers, more financial expenditures and delay in the timely access to the right care. Since the last decade, the Country has invested in increasing the production of skilled and specialized human resource (HRH Program) and this has increased the number of Specialists including Surgeons, Anesthesiologists and Gynecologists. With the increase of Specialists through HRH program, more specialists are being deployed to work in rural and lower level Hospitals and improvement are being seen in the way patients with surgical emergencies are being diagnosed and managed affecting the overall outcome of such patients. The aim of our study

was to identify common surgical indications of laparotomy and their management in the presence of a skilled Surgeon in a limited source and rural Hospital in Rwanda.

Methods

This is a retrospective study done over 3years period from September 2016 to august 2019 in the Ruhengeri referral hospital, located in the Northern Province in Rwanda. All patients underwent laparotomy in the department of surgery with sufficient data (demography diagnosis and intervention done) have been enrolled into the study. There was no age or sex, emergency or elective case restriction. Patients underwent cesarian section and other elective gynecological conditions have been excluded as they represent a separate operative group with different management needs. Analyzed variables were: age, sex, intraoperative findings and procedure done. Data have been analyzed using SPSS 16.0 and correlation statistical analysis for age and diagnosis was calculated, and positive correlation was significant if P value is <0.005.

Results

In this study 232 patients underwent laparotomy, sex ratio M: F was 2.2:1. The most affected age group was young people aged between 21 to 30 years representing 18,6 % and old people, above 65 years representing 12,9%. The most common final diagnosis was small bowel obstruction (22.2%) followed by hollow viscus perforation (Gastric duodenal perforation and ileal perforation) at and then sigmoid volvulus (15.3%). Small bowel obstruction was most common in young people while sigmoid volvulus was common in the older people. The bowel obstruction and perforation are common in males while appendicitis, small bowel obstructions are common in females. Female's patients are more likely to undergo many different types of surgical procedures. Table 1 & 2 The most common procedure done was bowel resection and primary end to end anastomosis (101 cases, 40.6%) Figure 1 & 2.

Table 1 Intraoperative findings

Final Diagnosis	Frequency	Percent	Valid Percent	Cumulative Percent
Sigmoid volvulus	38	15.3	15.3	21.8
Redundent sigmoid	6	2.4	2.4	24.2
Micellanous	34	13.7	13.7	37.9
Ileal perforation	28	11.3	11.3	49.2
Appendicitis	22	8.9	8.9	58.1
Small bowel obstruction	55	22.2	22.2	80.2
Intussusception	8	3.2	3.2	83.5
Duodenal perforation	11	4.4	4.4	87.9
Gynecological problems	6	2.4	2.4	90.3
Gastric tumor	11	4.4	4.4	94.8
Gastric perforation	13	5.2	5.2	100
Total	248	100	100	

This table is showing frequency of the common intraoperative findings during explorative laparotomy, miscellaneous findings where the less common and they included hepatobiliary conditions, urologiy conditions, hypersplenism, intrabdominal organ injuries due to trauma.

Table 2 Procedures done

Procedure	Frequency	Percent	Valid Percent	Cumulative Percent
Sigmoidectomy + primary ETEA	44	17.7	17.7	24.2
Sigmoidectomy + colostomy	6	2.4	2.4	26.6
Appendectomy	24	9.7	9.7	36.3
Perforation repair + wash out	32	12.9	12.9	49.2
Hemicolectomy + anastomosis	11	4.4	4.4	53.6
Ileal resection + Primary ETEA	46	18.5	18.5	72.2
Ileal resection + ileostomy	11	4.4	4.4	76.6
Miscellaneous	58	23.4	23.4	100
Total	248	100	100	

This table is showing frequency of surgical procedures done in the rural hospitals. Miscellaneous surgical procedure done is the ones which are less common: hepatobiliary surgery, urologic surgery, gastrectomy or pyloroplasty, splenectomy and gynecological procedures.

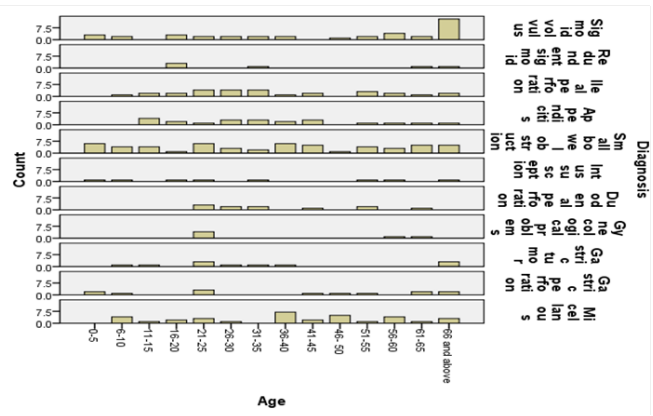

Figure 1 Diagnosis by age distribution.

Discussion

Laparotomy is a common major operation with high risk done mainly in almost of all high level facilities to save lives. Frequently the exact diagnosis is found when the abdomen is open. Even if paraclinical investigations means are being developed are expensive and poorly distributed around the world. The surgeon remains the one to make decision to decide the laparotomy guided by clinical findings. In our study the males were more likely to undergo laparotomy in general than female with M:F ratio of 2.1:1. The male predominance found in our study is similar to the findings by the others studies done in Uganda , Ethiopia and India e1,[13,14] However a study done by George C. Obonna et al.,[14] in Nigeria, revealed that females were more affected by appendicitis intestinal obstruction and hollow viscus perforation than males,[14] sigmoid volvulus was the most common in males than females. In our Study the most affected age group was

young people aged between 21 to 30 years representing 18,6 % and old people above 65 years representing 12,5% of all patients. Intestinal obstruction was the most common diagnosis at 22.2% and was more common among people aged between 21 to 30 years as it represented in this group Table 3. Hollow viscus perforation (ileal perforation and gastroduodenal perforations) was the second most common diagnosis in our study (21%) and males were more affected than males (see table 4), while sigmoid volvulus occupied the third position at 15.3% with an increased frequency among elderly population above 65 years Table 3. Similary to our study which showed that hollow viscus perforation was most common among ayounger adults study done in India by Anjaneya el al has also shown same findings as hollow viscus perforation was the common diagnosis between 3rd and 4th decade of life. Our study revealed that small bowel obstruction and appendicitis are most common in young population while above 65 years sigmoid volvulus leads followed by small bowel obstruction and gastric malignancies in our study. In their studies done in the different hospitals in Ethiopia Wossen et al.[13] John Owoode Agboola et al & Addisu Melkie et al shown that appendicitis leads the list followed by intestinal obstruction and hollow viscus perforation. Generally, intraoperative diagnosis in our study was Intestinal obstruction (Small bowel obstruction was the 1st 22.9% followed by sigmoid volvulus 15.3% and intussusception 3.2%). In the study done by Soressa et al.,[15] revealed the similar results: Small bowel obstruction dues to volvulus and intussusception occupy 61.2% followed by large bowel obstruction where sigmoid volvulus is 69%. The second was hollow viscus perforation while appendicitis was the 3rd. This is in the contrast to the studies done by John Owoade Agoboola et al in Nigeria and two studies Ethiopia where acute appendicitis was the commonest followed by pertonitis secondly to the hollow viscus perforation and Intestinal Obstruction.[1,6,13,15]

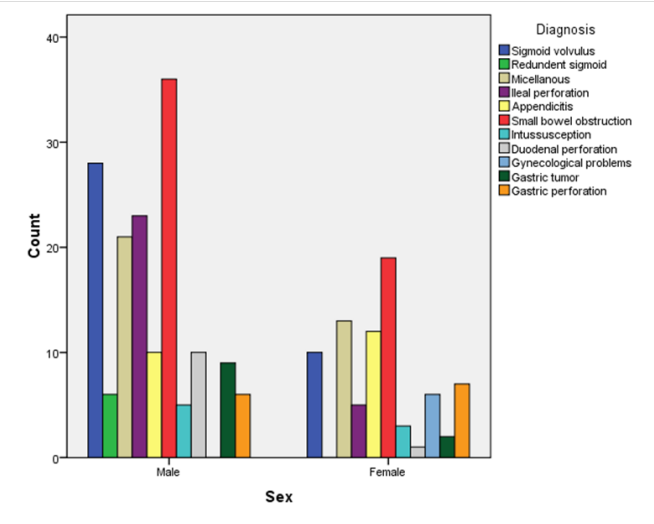

Figure 2 Diagnosis by sex.

In the management of Intestinal obstruction, the management options are commonly devaluation, resection and anastomosis or stoma depending upon the patient status, the cause of obstruction, bowel viability. In our study the most frequent operation done was bowel resection (Ileal resection, sigmoidectomy) primary anastomosis (40.6%) followed by perforation repair and wash out (12.9%). Similary the study done in the management of intestinal obstruction by Soressa U. et al in the Adam hospital the commonest surgical intervention performed was bowel resection and anastomosis (40.5%).[15] Suprisingly ,in our study open appendectomy represented only 9.7% of all abdominal surgeries during the study period while in other studies appendectomy tend to be a common procedure as appendicitis remains the most common intraoperative diagnosis in acute surgical abdomen[13, 16,17] Globally surgical abdominal conditions are common worldwide and young and old people are highly affected, especially in the rural areas with limited means to access appropriate surgery timely.

Conclusion

Access to surgery remain unequally distributed and unmet need to lifesaving surgical interventions is much accentuated in low income Countries compared to high income Countries as well as for patients living in hard to reach areas compared to those living in towns. Unfortunately, surgical emergencies are as common in hard to reach areas as in areas with better access. Availing necessary infrastructures and skilled health personnel with clear retention strategies for sustainability can improve access to surgery and better health outcome without discrimination for all patients in need of emergency abdominal surgeries.

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Conflicts of interest

The authors declared that there are no conflicts of interest.

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References

1. Patil S, Rinaldo M. A Study of exploratory laparotomies for various reasons from 2012-2016 at Basaveshwar teaching and general hospital, Kalaburagi. *Sch J App Med Sci*. 2016;4(8B):2843–2849.
2. Ahmad R, Salman MS, Syed WH, et al. Burden of emergency exploratory laparotomies : sleepless nights in operation rooms. *Ulutas Med J*. 2019;5(1):1–6.
3. Collaborative G. Mortality of emergency abdominal surgery in high-, middle- and low-income countries. *Br J Surg*. 2016;103(8):971–988.
4. Dietz DW, Bailey HR. Postoperative Complications. 141–155.
5. Hendriksen BS, Keeney L, Morrell D, et al. Epidemiology and perioperative mortality of exploratory laparotomy in rural Ghana. *Ann Glob Health*. 2020;86(1):1–7.
6. Ologunde R, Maruthappu M, Shanmugarajah K, et al. Surgical care in low and middle-income countries: burden and barriers. *Int J Surg*. 2014;12(8):858–863.
7. Ozgediz D, Jamison D, Mcqueen K, et al. The burden of surgical conditions and access to surgical care in low- and middle-income countries. *Bull World Health Organ*. 2008;86(8):646–647.
8. Meara JG, Leather AJM, Hagander L, et al. Global surgery 2030 : evidence and solutions for achieving health , welfare , and economic development. *Surgery*. 2015;158(1):3–6
9. Grimes CE, Bowman KG, Dodgion CM, et al. Systematic review of barriers to surgical care in low-income and middle-income countries. *World J Surg*. 2011;35(5):941–950.
10. Luboga S, Macfarlane SB, Schreeb J Von, et al. Increasing access to surgical services in Sub-Saharan Africa : priorities for national and international agencies recommended by the Bellagio essential surgery group. *PLoS Med*. 2009;6(12):e1000200.

11. Akenroye OO, Adebona OT, Akenroye AT. Surgical care in the developing world-strategies and framework for improvement. *J Public Health Afr*. 2013;4(2):e20.

12. Ploth DW, Rodrigues-pinto E. Cited by recommended articles editor s corner Novel approach to recanalizing an occluded cystic duct after cholecystoduodenostomy by lumen-apposing metal mesh stent for malignant obstructive jaundice surgical volume and postoperative mortality rate at a referral hospital in western Uganda : measuring the lancet commission on global surgery indicators in low-resource settings. 2017;4(1):2049.

13. Wossen MT. Pattern of emergency surgical operations performed for non-traumatic acute abdomen at ayder referral hospital ,Mekelle University, Tigrai , Ethiopia by the year 2000-2003 Ec. *J Clin Trials*. 2019;9(5):1000375.

14. Obonna GC, Arowolo OA, Agbakwuru EA. Emerging pattern of emergency abdominal surgeries in Ile-ife Nigeria. *Niger J Surg Sci*. 2014;24(2):31–35.

15. Soressa U, Mamo A, Hiko D, et al. Prevalence, causes and management outcome of intestinal obstruction in Adama hospital, Ethiopia. *BMC Surg*. 2016;16(1):38.

16. Demetriades D, Rabinowitz B, Hospital B,et al. Indications Operation Stab. 345:129–132.

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