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Preliminary Results of Stapled Gastrectomy in Four Reference Hospitals in Yaoundé

Résultats Préliminaires de la Gastrectomie Mécanique dans quatre Hôpitaux de Référence à Yaoundé

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ABSTRACT

Introduction. In Cameroon, mechanical forceps are increasingly used in various digestive surgical procedures in general and gastric in particular. The aim of this study was to report our experience of the use of mechanical forceps in gastric resections. **Materials and methods.** We conducted a descriptive cross-sectional study from 1st of January 2017 to 31st of December 2021, in four hospitals of Yaoundé, Cameroon. Patients' demographic, clinical presentation, surgical findings and 30-days postoperative outcomes data were collected. **Results.** We collected 39 files. The male to female ratio was 1.3 and the average age was 55.13 ± 12.07 years. Thirty patients (76.9%) had a history of gastritis and peptic ulcer disease and 25 patients (64.1%) were diabetic. Twenty-six (26) cases (66.7%) of gastric resections were indicated for adenocarcinoma. A 4/5th subtotal gastrectomy was performed in 23 patients (59%). Four (4) patients (10.3%) had atypical resections. Stapled resection was performed in all the 4 atypical gastrectomy's patients. For the 35 other patients, at least one step of the surgery was stapled. The mean operative time 188 minutes in total stapled gastrectomy and 246 minutes in mixed gastrectomy. Postoperative morbidity and mortality were respectively of 56.4% and 23.1%. **Conclusion.** Stapled gastrectomy is feasible in Cameroun without intraoperative complications. Postoperative morbidity and mortality are very high but do not seem to be favoured by the use of mechanical forceps.

RÉSUMÉ

Introduction. Au Cameroun, les pinces mécaniques sont de plus en plus utilisées dans diverses interventions chirurgicales digestives en général et gastriques en particulier. Le but de cette étude était de rapporter notre expérience de l'utilisation de pinces mécaniques dans les résections gastriques. **Matériels et méthodes.** Nous avons mené une étude transversale descriptive du 1er janvier 2017 au 31 décembre 2021, dans quatre hôpitaux de Yaoundé, Cameroun. Les données démographiques, la présentation clinique, les données chirurgicales et les résultats postopératoires à 30 jours ont été collectés. **Résultats.** Nous avons recueilli 39 dossiers. Le sex ratio était de 1,3 et l'âge moyen était de 55,13 ± 12,07 ans. Trente (30) patients (76,9 %) avaient des antécédents de gastrite et d'ulcère gastroduodénal et 25 patients (64,1 %) étaient diabétiques. Vingt-six (26) cas (66,7) de résections gastriques étaient réalisées pour un adénocarcinome. La gastrectomie des 4/5ème était réalisée chez 23 patients (59 %). Quatre (4) patients (10,3 %) avaient eu des résections atypiques, toutes totalement mécaniques. Pour les 35 autres patients, au moins une étape de l'intervention avait été faite avec des pinces. La durée opératoire moyenne était de 188 minutes en cas de gastrectomie totalement mécanique et 246 minutes en cas de gastrectomie mixte. La morbidité et la mortalité postopératoires étaient respectivement de 56,4 % et 23,1 %. **Conclusion.** La gastrectomie mécanique est faisable au Cameroun sans complications peropératoires. La morbi-mortalité postopératoire est très élevée mais ne semble pas favorisée par l'utilisation de pinces mécaniques.

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HIGHLIGHTS OF THE STUDY

What is known on this topic:
The use of mechanical forceps can shorten the duration of the surgery

What question this study address:
The results of the use of mechanical forceps in gastric resections and digestive reconstructions in Yaounde

What this study adds to our knowledge:
Postoperative morbidity and mortality after gastrectomy are very high but do not seem to be favoured by the use of mechanical forceps

How this is relevant to practice policy or further research:
Promote the use of mechanical forceps in gastric and digestive surgery

INTRODUCTION

Gastrectomy is a common surgical procedure in our practice [1]. It is most often performed for malignant pathologies, although benign pathologies represent one in four patients in a previous study [1]. Postoperative morbidity and mortality are very high in Cameroon and in Africa [1-5], compared to Western countries [6,7]. Gastrectomy consists of a resection of all or part of the gastric pouch associated with digestive reconstructions which depend on the type of resection, the underlying pathology and the habits of the surgeon. Traditionally, all these steps have always been done manually.

Currently, stapled gastrectomies are increasingly being performed, with all or part of the procedures using mechanical forceps. Under other circumstances, it would be the preferred mode of resection and anastomosis for a large proportion of practitioners, with significant variations depending on the world region [8,9]. The high cost of this material probably limits its use in countries with limited resources. If the use of staplers offers undeniable advantages in terms of operating time, the benefit is less clear, or even non-existent, with regard to post-operative outcomes [10-16]. For other authors, the use of staplers is associated with an increase in anastomotic complications [15,17,18]. In our country, mechanical forceps are increasingly used in various digestive surgical procedures in general and gastric in particular. In our humble opinion, no study has yet been conducted on stapled gastrectomies in Cameroon. We therefore proposed to conduct this study with the aim of reporting our experience of the use of mechanical forceps in gastric resections and digestive reconstructions after gastrectomy.

METHODS

We conducted a descriptive cross-sectional study in four hospitals of Yaoundé, a city capital of Cameroon: Yaoundé University Teaching Hospital, Yaoundé General Hospital, Yaoundé Central Hospital and National Social Insurance Fund Health Centre Essos. These are the four main hospitals in Yaoundé where gastrectomy is routinely done. We reviewed the operative and hospitalization's reports of these hospitals to identify all the patients who underwent a stapled gastrectomy for a 5-year period spanning from the 1st of January 2017 to 31st of December 2021. Their files were then consulted to fulfil the data collection form; studied variables were: Patients' demographic, clinical presentation, surgical findings and technics and postoperative 30 days outcomes. Incomplete files and files of patients who had bariatric surgery and those of patient's loss to follow up before the postoperative day 30th were excluded. All data were analysed with IBM SPSS® (SPSS Inc., version 23, Chicago, IL, USA) and Microsoft Excel 2016. Counts and percentages were determined for categorical variables and means and standard deviations calculated for the continuous variables. Postoperative complications were classified using the Clavien Dindo grading scale.

RÉSULTS

During the study period, 48 patients underwent stapled gastrectomy. Nine (9) files (18.7%) were excluded: 6 sleeve gastrectomy and 3 non exploitable files. We thus collected 39 patient's files. There were 22 men (56.4%) and 17 women (43.6%) with a sex ratio of 1.3. They were aged from 23 to 78 years with a mean age of 55.13 ± 12.07 years. Twenty-six (26) patients (66.7%) were above 50 years old. Thirty (30) patients (76.9%) had a history of gastritis and peptic ulcer disease (PUD) and 25 patients (64.1%) were diabetic. Alcohol consumption and tobacco smoking were found respectively in 12 patients (30.8%) and in 18 patients (46.2%) respectively. Epidemiological data of patients are reported in Table I.

Table I. Epidemiological data of the study population

Variables	N	%
Sex		
Male	22	56.4
Female	17	43.6
Age (years)		
< 50	13	33.3
≥ 50	26	66.7
Comorbidités		
Smoking	18	46.1
Alcohol consumption	12	30.8
Diabetes	25	64.1
Hypertension	12	30.8
PUD/Gastritis	30	76.9
H. pylori positive	20	51.3
Past history of gastrectomy	1	2.6

Weight loss and abdominal pains were the most common clinical signs present in 36 cases (92.3%) and in 30 cases (76.9%) respectively. An abdominal mass was palpable in 8 cases (20.5%) and 13 patients (33.3%) presented with ascites. Clinical data of patients are summarized in Table II. Twenty-six (26) cases (66.7%) of gastric resections were indicated for adenocarcinoma. Upper gastro-intestinal bleeding accounted for 3 cases (7.7%) of surgical indications (Figure 1). Twenty-three (23) lesions (59%) were located at antropyloric region (Figure 2).

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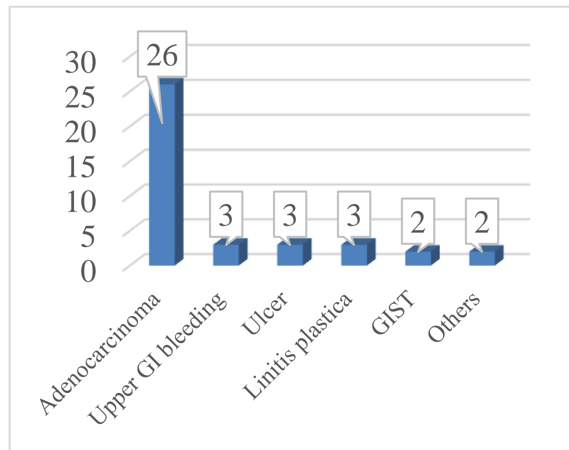


Figure 1. Indications of gastric resection

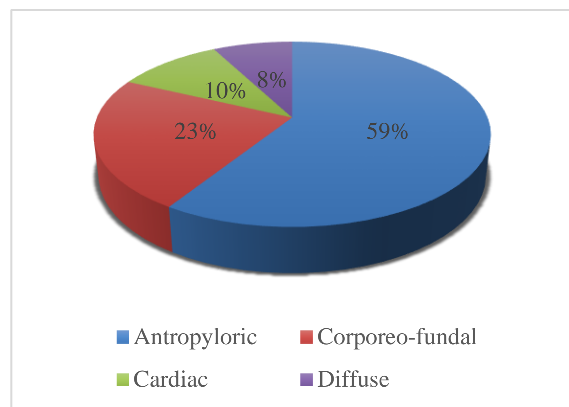


Figure 2. Location of Lesions

Table II. Clinical data of the study population

Variables	N	%
Clinical presentation at admission		
Vomiting	22	56.4
Abdominal pains	30	76.9
Abdominal mass	8	20.5
Virchow's node	12	30.8
Peri-umbilical nodule	3	7.7
Anorexia	24	61.5
Weight loss	36	92.3
Haematemesis	8	20.5
Ascites	13	33.3
WHO performance status		
Grade 0	8	20.5
Grade I	10	25.6
Grade II	9	23.1
Grade III	12	30.8

All the patients were operated under general anaesthesia. The surgical approach was a midline laparotomy in 37 cases (94.9%) and a bi-subcostal approach in 2 cases (5.1%). A 4/5th subtotal gastrectomy was performed in 23 patients (59%). Total gastrectomy was done in 7 cases (17.9%) and 4 patients (10.3%) were offered atypical resections (Figure 3). Stapled resection was performed in all the 4 atypical gastrectomy's patients. For the 35 other patients, at least one step of the surgery (resection or reconstruction) was stapled (Figure 4).

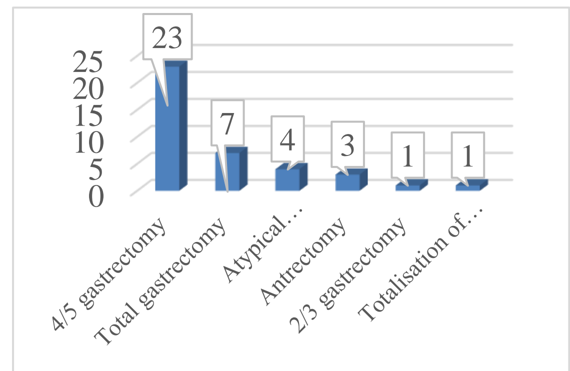
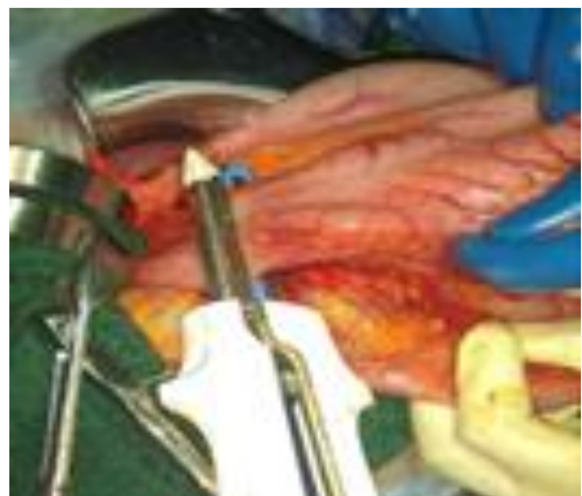


Figure 3. Types of gastric resection



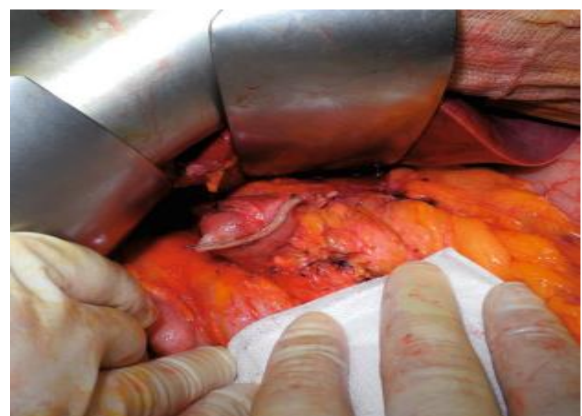


Figure 4: A/ Mechanical duodenal section
B/ Duodenal stump

Digestive continuity was re-established using Roux-en-Y reconstruction in 20 cases (51.4%). Modalities of stapled digestive sections and reconstructions are displayed in Table III. Associated gestures included 2 cases of segmental colectomy and one case of splenectomy. The mean operative time was 217 minutes. It was 188 minutes in total stapled gastrectomy and 246 in mixed hand sewn

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and stapled gastrectomy. The mean length of hospital stay was 19.5 days; 16.7 days in total stapled gastrectomy and 22.3 days in mixed hand sewn and stapled gastrectomy. Of all the 39 patients, 22 patients presented with at least one complication within the month following the surgery, giving a 30 days morbidity of 56.4%. Fistula and pneumonia were the main complications, reported in 7 and 6 patients respectively. Figure 5 resumes complication's distribution in the study population. Nine cases of death were recorded within the 30 days following the surgery, giving a postoperative mortality of 23.1%. The causes of death were pulmonary embolism in 2 cases, high output fistula in 4 cases and peritonitis in 3 cases.

Table III. Modalities of stapled digestive section and reconstruction

Variables	Stappled procedures		Manual procedures	
	N	%	N	%
Duodenal section	23	59	12	41
Gastric/esophageal section	30	76.9	5	23.1
Duodenal stump closure	23	59	12	41
Gastro/esophago-jejunal anastomosis	30	76.9	5	23.1
Jejuno-jejunal anastomosis	15	38.5	20	61.5

DISCUSSION

This study reveals that mechanical gastrectomies are feasible in Cameroon without intraoperative complications. However, postoperative complications and mortality are high. This is a preliminary, retrospective, although multicentre study on a small sample size. In addition, all the steps of the different procedures were not always stapled, the use of mechanical forceps could only concern resection or reconstruction. We therefore cannot give hasty conclusions or launch into an abusive generalization of the results. Further studies on larger samples with better harmonization of procedures are necessary to validate these results.

The distribution by sex, mean age, risk factors and comorbidities and clinical presentation of patients are similar to those reported in one of our previous series [1]. As in this study, the indications for gastrectomy are mainly cancerous pathologies [1,18]. Most series in the literature report exclusively on gastric resections for cancer. The different types of resection and reconstruction techniques are the same as those of other authors and depend on the nature and location of the lesions [1,4,5,7]. Mechanical resections are generally associated with shorter operating times, compared to manual procedures [14,15]. In this series, although we did not compare mechanical gastrectomies to manual ones, we note that operative times are shorter in totally mechanical procedures (average of 188 minutes) than with procedures where one or more steps are manual (average of 246 minutes). Kravetz et al reported in their series a shorter operating time in patients who had manual procedures [11].

The duration of hospitalization is shorter (16.7 days) in the case of mechanical gastrectomy compared to 22.3 days in mixed gastrectomies. The use of mechanical forceps does not seem to modify the length of hospitalization after gastrectomy [12]. In general, mechanical and manual gastrectomies have globally similar surgical outcomes in terms of anastomotic complications [10,12,14,15,19]. However, these results are not found by all authors. In their systematic review, Fakas et al found a statistically signifcant increases in postoperative bleeding rates, marginal ulcer rates, and stricture rates with the use of mechanical circular stapling devices at the gastrojejunostomy anastomosis site when performing laparoscopic Roux-en-Y gastric bypass [17]. For Takeyoshi et al and Markar et al, there is an increase in anastomotic stricture in the case of mechanical anastomosis and this complication should be taken into consideration when choosing this technique [15,19]. Postoperative morbidity and mortality in this series are very high, 56.4% and 23.1% respectively. These findings are higher than those of other African authors and elsewhere [4-7,18,20]. Our results are, however, similar to those of one of our previous studies [1].

CONCLUSION

Mechanical gastrectomy is feasible in Cameroon without intraoperative complications. It makes it possible to shorten operating times and hospital stay. Postoperative morbidity and mortality are very high but do not seem to be favoured by the use of mechanical forceps.

CONFLICTS OF INTEREST:

No conflicts of interest to declare

ETHICAL CONSIDERATIONS

The present study was approved by the institutional ethical clearance committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I under the n° 313/UYI/FMSB/VDRC/DAASR/CSD of June 6, 2022. All authorizations were obtained from the managers of the different sites selected for the study.

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