

Intestinal Resection: Indications and Prognostic Factors at the General Surgery Department of Kankan Regional Hospital

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Abstract

Introduction: Intestinal resection is the disconnection or removal of part of the intestine with its meso. The aim was to describe the indications and prognostic factors for intestinal resections at the surgical department of Kankan Regional Hospital. **Patients and Methods:** This was a retrospective descriptive study covering the files of patients who had undergone intestinal resections in the surgery department of the Kankan regional hospital over a period of 4 years from 1st January 2019 to December 31, 2022. **Results:** We collected 164 cases of intestinal resection representing 4.19% of all surgical procedures. (N = 3909). The average age of our patients was 37.78 years with extremes of 1 and 90 years. The male gender was predominant (64.6%) and the sex ratio was 1.8. The majority of patients consulted after 72 hours. Acute intestinal obstruction was the pathology motivating the most intestinal resection 42.90% followed by acute peritonitis 33%, digestive fistula 4.3%, tumors 3.6% and wounds 2.4%. Intestinal necrosis with 91 cases (56.5%) constituted the first indication for resection in our study followed by intestinal perforations 41 cases (24.9%). We performed an anastomotic resection of the small intestine in 70 cases (42.9%), an ileostomy in 4 cases (2.4%), a right hemi colectomy in 26 cases (15.9%), a left hemi colectomy in 2 cases (1.2%), segmental colectomy plus immediate anastomosis in 57 cases (34.2%) and 5 cases of colostomy. We recorded 48 deaths (29.3%). **Conclusion:** Intestinal resection is a common

procedure in our context. These indications are multiple. An improvement in the prognosis should be achieved by reducing the diagnostic and treatment time associated with the training of surgical staff.

Keywords

Intestinal Resection, Anastomosis, Indication, Mortality

1. Introduction

Intestinal resection is the removal of part of the intestine with its meso [1]. It is indicated in tumor lesions, inflammatory lesions, vitality lesions of the intestinal loop, traumatic and ischemic lesions of the small intestine and colon [2]. Intestinal resection techniques have evolved significantly over the last 20 years. In fact, since 1991, when the first series of laparoscopic colectomies were published, it has been technically possible to perform colectomies and total colectomies with ileo-anal anastomosis laparoscopically, particularly in chronic inflammatory diseases of the intestine or cancers of the right colon [3]. However, for the majority of studies from expert centers, the place of laparoscopy is still of little importance today, probably due to the need to have experience in laparoscopic colorectal surgery [3].

In France in 2008, an intestinal resection was performed in 20% of children three years after the diagnosis of CD [4].

In Africa, several authors report intestinal resection for various pathologies of the small intestine and colon such as intestinal obstructions with necrosis, intestinal perforations of infectious origins, intestinal wounds and tumor lesions [5].

In Cameroon, according to a study carried out by Bwelle G.R *et al.* in 2016, intestinal resection with anastomosis was the most commonly performed surgical procedure in 14 cases, or 53%) [6].

In Guinea, Camara NLY *et al.* in 2023 collected 51 cases of digestive ostomy representing 15.93% of all surgical procedures in the department (N = 320) [7].

The objective of this study was to contribute to the study of intestinal resections in the general surgery department of the Kankan regional hospital.

2. Material and Methods

This was a 4-year descriptive retrospective study, from 1st January 2019 to December 31, 2022, relating to the files of patients who underwent intestinal resections in the general surgery department of the Kankan regional hospital during the study period.

All complete files of patients who underwent intestinal resection were included in this study, regardless of the pathology involved during our study period. Incomplete and unusable patient files were excluded.

We made an exhaustive inventory of all the files of patients who were operated

on and benefited from resection of any part of the intestine in the department during the study period.

Our study variables were qualitative and quantitative divided into epidemiological and therapeutic data. For qualitative variables, we determined the proportions (prevalence) estimated as a percentage (%) with the calculation of the ratio for sex. For the quantitative variables, we divided them into classes, calculated the mean, the standard deviation, the median then identified the minimum and the maximum. These data were entered into kobocollect and analyzed in the SPSS software in version 21. The data were collected anonymously and the principle of confidentiality was respected.

3. Results

Out of a total of 3909 cases of surgical interventions, there were 164 cases of intestinal resections during the period of our study, or 4.19%. The average age of our patients was (37.78 ± 21.93) with extremes of 1 and 90 years; the age group ≤ 20 years was the most affected with 27.4% (**Table 1**).

Table 1. Distribution of patients according to age groups.

Age groups in year	Workforce	Percentages
≤ 20	45	27.4
21 - 30	29	17.7
31 - 40	23	14.0
41 - 50	20	12.2
51 - 60	14	8.5
>60	33	20.1
Total	164	100

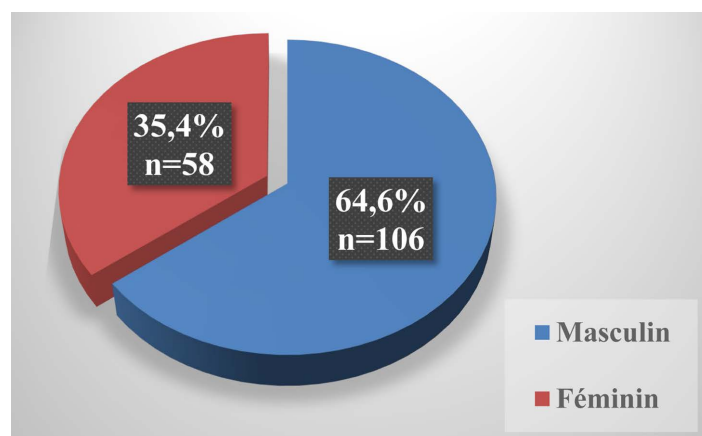


Figure 1. Distribution of patients by gender.

Men were the most affected with 106 cases (64.6%) compared to 58 women (35.4%) with a sex ratio of 1.8 (**Figure 1**).

In our series of 132 cases, 80.5% of resections were performed in patients who consulted 72 hours after the onset of symptoms (**Table 2**).

Table 2. Distribution of patients according to progression.

Progression in hours	Workforce	Percentages
≤72	32	19.5
>72	132	80.5
Total	164	100

One hundred patients, or 60.9%, had already undergone surgery and had a laparotomy scar. In our series, acute intestinal obstruction with necrosis was the pathology leading to intestinal resection n = 70 or 42.9%. It is followed by acute peritonitis 54 cases or 33% of which ileal perforation probably of typhoid origin is the first cause, digestive fistula 13 cases or 7.9% which were often complications of surgical interventions carried out in the structures of lower level and unauthorized structures (**Table 3**).

Table 3. Distribution of patients according diagnostic.

Diagnosis	Workforce	Percentages
Acute intestinal obstruction	70	42.9
Generalized acute peritonitis	54	33
Digestive fistula	13	7.9
Abdominal tumors	10	6
Abdominal wound	8	4.8
Dolichocolon	7	4.3
Strangulated inguinal hernia	2	1.2
Total	164	100

Table 4. Distribution of patients according to the indications for resection.

Indications	Workforce	Percentages
Small bowel necrosis	50	31.6
Perforation intestinale	42	25.8
Colon necrosis	41	24.9
Digestive fistulas	13	7.9
Dolicho colon	7	4.3
Colonic tumors	4	2.4
Small bowel tumors	3	1.8
Hail wound	2	1.2
Colon wound	2	1.2
Total	164	100

Table 5. Distribution of patients according to lesions found during exploration.

Lesions	Workforce	Percentages
Necrosis	91	56.5
Perforation	42	25.8
Wound	4	2.4
Others	29	15.3
Total	164	100

Table 6. Distribution according to the gesture performed.

Gestures	Workforce	Percentages
Small bowel resection + anastomosis	70	42.9%
Segmental colonic resection + anastomosis	57	34.2
Right hemi colectomy	26	15.9
Colonic resection + colostomy	5	3
Hartmann	4	2.4
Bouilly volkman	1	0.6
Ileostomy	4	2.4
Left hemi colectomy	2	1.2
Total	164	100

Table 7. Distribution of patients according to anastomosis segments (N = 164).

Anastomoses	Workforce	Percentages
Ileo ileum	49	29.9
Colorectale	38	23.1
Ileocolic	35	21.3
Colocolic	21	12.8
Jéjuno-ileale	9	5.5
Jéjuno-jejunale	6	3.7
Ileocecal	6	3.7
Total	164	100

Table 8. Distribution of patients according to the duration of the intervention.

Duration of the intervention	Workforce	Percentages
≤1 hour	1	0.6
1 - 2 hours	145	88.4
>2 hours	18	11
Total	164	100

Medial laparotomy above and below the umbilical was the rule in our study 98.8%. We performed a one-stage small bowel anastomosis resection in 70 cases (42.7%) and an ileostomy in 4 cases (2.4%). We performed a right hemi colectomy in 26 cases (15.9%), a left hemi colectomy in 2 cases (1.2%), a segmental resection plus immediate anastomosis in 57 cases (34.2%) and 5 patients. Benefited from a colostomy (4 cases of Hartman and 1 case of Bouilly Walkman) (Table 4). During exploration, we noted 55.1% (n = 91) of necrosis; 25.4% (n = 42) perforations (Table 5).

Speaking of the duration of intervention 88.4% (n = 145) were operated on between 1 hour and 2 hours; 18 patients or 11% had been operated on after 2 hours (Tables 6-8).

4. Discussion

Out of 3909 cases of surgical interventions performed there were 164 cases of intestinal resections during the period of our study, *i.e.* 4.19%. Our result is superimposable to that of Niangalya A [8] in 2019 who reported a frequency of 5.9% of intestinal resections in the general surgery department of Somie Dolo hospital in Mopti. In our context this relatively high frequency of resection would be justified by the frequency of peritonitis due to typhoid perforation, intestinal obstructions with intestinal necrosis, the delay in consultation, the proliferation of clandestine clinics with incompetent staff and the insufficient number of specialists in visceral surgery, in the Kankan region.

The average age of our patients was (37.78 ± 21.93) with extremes of 1 and 90 years; the age group ≤ 20 years was the most affected with 27.4% Toure C.T [9] in Senegal reported in his study on emergency colectomies in sigmoid volvulus a mean age of 42 years. Lebau R [10] in 2006 also reported an average age of 40 years. In our context, this result could be explained by the structure of the population which is predominantly young and also by the fact that the indications for intestinal resections are due to pathologies in young adults [9].

The male gender was the most affected with 106 cases (64.6%) with a M/F ratio = 1.8. In our series, as in most African series involving intestinal resection, male predominance is the rule [11]. This male predominance is explained by the fact that certain pathologies, notably strangulated hernias, and certain peritonitis were more frequent in men [12].

In our series, 132 cases (80.5%) of resections were performed in patients who consulted 72 hours after the onset of symptoms. As in the Lebeau R series [10], the long consultation period is a determining factor in intestinal resection because it is generally considered to be an important factor in necrosis. Often the cause of late consultations is attributable to patients and two main factors can be blamed according to Kurt [13]: socio-economic difficulties but also ignorance; as was the case in our study.

One hundred (100) patients or 60.9% had already undergone surgery and had a laparotomy scar. Indeed, the laparotomy scar exposes one to acute intestinal

obstruction (bridle, adhesion, volvulus, etc.) which can lead to necrosis, which is a common and costly complication of abdominal surgery [14].

In our series, acute intestinal obstruction with necrosis was the pathology most motivating intestinal resection in 70 cases or 42.9%. It represents the second surgical emergency in terms of frequency in the series of Magagi in Niger (27.49%) [15], Gaye in Dakar (22.9%) [16] with a high frequency of necrosis which has no treatment as intestinal resection. In our context this is due to the multiplicity of causes of this condition (hernia strangulation, bridles, colonic tumors, volvulus, etc.). It is followed by acute peritonitis 54 cases or 33% of which ileal perforation probably of typhoid origin is the primary cause; Kassegne [17] found 67.9% of all peritonitis. Digestive fistula 13 cases or 7.9% which were often complications of surgical interventions carried out in lower-level structures and unauthorized private structures.

Midline laparotomy above and below the umbilical was the rule in our study 98.8%; as in most African series (Adamou *et al.* 2015 [18], Choua *et al.* 2015) [19].

This route offers a view of the entire peritoneal cavity while facilitating exploration and performance of procedures complementary to resection such as peritoneal toilet.

Intestinal necrosis with 50 cases (31.6%) on the small intestine, 41 cases (24.9%) on the colon constituted the first indication for resection in our study followed by intestinal perforations 42 cases (25.8%). The predominance of necrosis in this study is justified by the frequency of intestinal obstructions by strangulation (bridles, volvulus, strangulated hernias).

Indeed, the delay in consultation and treatment has negatively influenced the occurrence of necrosis. Harouna Y [20] in Niger and Lebeau R [10] in Ivory Coast reported intestinal necrosis by strangulation in the respective proportions of 87% and 25%. According to Harouna Y [11] in occlusions by strangulation from the 25th hour, the frequency of necrosis increases proportionally to the diagnostic and therapeutic delay and increases from 28% to 52% beyond the 96th hour. Perforation of the small intestine of probably typhoid origin is very common and very often surgical treatment requires the performance of an intestinal resection plus anastomosis, which theoretically allows the sutures to be placed in a healthy area, logically protecting against subsequent intestinal perforations. on the pre-perforated areas [21]. Colic or intestinal wounds are secondary to trauma to the abdomen. El Bechir [21] in Morocco in 2012 noted 49 cases of traumatic colonic wounds with 12% anastomotic resection.

Harouna Y [20] reported intestinal resection for colorectal cancers in 100% of cases; Ayite [22] in Lomé reported 100% resection for small bowel cancer in 1996. Intestinal resection in cases of intestinal tumors is done with the aim of removing obstacles to intestinal transit and total excision of the tumor.

We performed a one-stage small bowel anastomosis resection in 70 cases (42.7%) and an ileostomy in 4 cases (2.4%).

Resection and anastomosis is preferable whenever the patient's general condition

allows it [20]. A stoma is justified by the theoretical risk of suture release to which re-connection in a septic environment exposes [11].

However, this diversion technique is rarely used in our practice due to the problems of maintenance and especially resuscitation that it requires in a hospital where the technical platform is insufficient.

We performed a right hemi colectomy in 26 cases (15.9%), a left hemi colectomy in 2 cases (1.2%), a segmental resection plus immediate anastomosis in 57 cases (34.2%) and 5 patients benefited from a colostomy (4 cases of Hartman and 1 case of Bouilly Walkman).

Speaking of the duration of intervention 88.4% (n = 145) were operated on between 1 hour and 2 hours; 18 patients or 11% had been operated on after 2 hours. This long duration could be explained by the number and severity of lesions found intraoperatively.

In our practice, colostomy presents significant morbidity: the hot and hostile climate, the problem of ostomy equipment, are sources of defective hygiene and local and general complications. Added to these are Muslim religious considerations, a negative psychological impact of colostomy on the experience of the patient who tends to “let go”.

The postoperative course was simple in 87 cases (53%), we recorded 29 cases of postoperative complications (17.7%) and 48 deaths (29.3%).

Mortality itself in our study would be attributable not to intestinal resection per se but rather to the indication for resection such as intestinal necrosis, wounds, perforations, tumors and infection.

The average length of hospital stay was 13 days with a range of 1 to 58 days. Our average stay is proportionally equal to that of Coulibaly [23] (18.4 days). On the other hand, a longer average stay is found in Kouame’s study [24]. Long hospital stay is linked to postoperative complications.

5. Conclusion

Intestinal resection is a relatively common procedure in our context, it is often performed in young adult males. Indications for resection were frequent for which patients consulted late. Mortality is much more linked to the indication for resection, diagnostic delay and treatment than to intestinal resection. An improvement in the prognosis should be achieved by reducing the diagnostic and treatment time associated with the training of surgical staff.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Weber, M. (1993) Resection of the Small Intestine: Until Where and After? *Medicine and Hygiene*, Geneva, 2164-2166.
- [2] Szappanyos, D. and Vuaride, L. (1993) Small Bowel Resection: Limit? *Medicine and Hygiene*, Geneva, 2167-2168.

- [3] Panis, Y. (2003) Surgical Management of Chronic Inflammatory Bowel Diseases: Consensus and Controversies. *Gastroentérologie Clinique et Biologique*, **27**, 1S92-1S97.
- [4] Vernier-Massouille, G., Balde, M., Salleron, J., Turck, D., Dupas, J.L., Mouterde, O., *et al.* (2008) Natural History of Pediatric Crohn's Disease: A Population-Based Cohort Study. *Gastroenterology*, **135**, 1106-1113. <https://doi.org/10.1053/j.gastro.2008.06.079>
- [5] Aloï, M., Birimberg-Schwartz, L., Buderus, S., Hojsak, I., Fell, J.M., Bronsky, J., *et al.* (2016) Treatment Options and Outcomes of Pediatric IBDU Compared with Other IBD Subtypes: A Retrospective Multicenter Study from the IBD Porto Group of ESPGHAN. *Inflammatory Bowel Diseases*, **22**, 1378-1383. <https://doi.org/10.1097/mib.0000000000000767>
- [6] Bwelle Motto, G.R., Chokkeng Ngoumfe, J.C., Bang, G.A., Ekani Boukar, Y.M., Tientcheu, T.F., Boye Marigoh, D., *et al.* (2022) Clinical and Operative Profile of Patients Who Died after Non-Traumatic Abdominal Surgery at Yaoundé Central Hospital. *Health Sciences and Disease*, **22**, 104-108.
- [7] Camara, N.L.Y., Kondano, S.Y., Diallo, M.C., Kamano, F.A., Tolno, J.T., *et al.* (2023) Digestive Ostomies: Indications and Complications in the General Surgery Department of the Ignace Deen National Hospital (Guinea). *African Journal of Surgery and Specialties*, **17**, 27-31.
- [8] Niangaly, A. (2019) Ileal Perforations of Typhus Origin in the General Surgery Department of Somine Dolo Hospital in Mopti.
- [9] Touré, C.T., Dieng, M., Mbaye, M., Sanou, A., Ngom, G., Ndiaye, A., *et al.* (2003) Results of Emergency Colectomy in the Treatment of Colon Volvulus at the University Hospital Center (CHU) of Dakar. *Annales de Chirurgie*, **128**, 98-101. [https://doi.org/10.1016/s0003-3944\(02\)00043-3](https://doi.org/10.1016/s0003-3944(02)00043-3)
- [10] Lebeau, R., Koffi, E., Diané, B., Amani, A. and Kouassi, J. (2006) Acute Intestinal Intussusceptions in Adults: Analysis of a Series of 20 Cases. *Annales de Chirurgie*, **131**, 447-450. <https://doi.org/10.1016/j.anchir.2006.04.007>
- [11] Harouna, Y., Sidou, B., Seibou, A., Abarchi, H., Abdou, I., *et al.* (2000) Typhoid Perforations: Clinical, Therapeutic and Prognostic Aspects, Prospective Study of 56 Cases Treated at the Niamey National Hospital (Niger). *Black African Medicine*, **47**, 269-274.
- [12] Ndong, A., Diallo, A.C., Tendeng, J.N., Diao, M.L., *et al.* (2020) Mechanical Intestinal Obstructions in Adults: Retrospective Study of 239 Cases at the Saint-Louis Regional Hospital, Senegal. *African Journal of Digestive Surgery*, **20**, 3143-3147.
- [13] Kurt, N., Oncel, M., Ozkan, Z. and Bingul, S. (2003) Risk and Outcome of Bowel Resection in Patients with Incarcerated Groin Hernias: Retrospective Study. *World Journal of Surgery*, **27**, 741-743. <https://doi.org/10.1007/s00268-003-6826-x>
- [14] Banza, M.I., Mukakala, A.K., Kasanga, T.K., Yumba, S.N., *et al.* (2022) Epidemiological, Clinical, Therapeutic and Evolutionary Profile of Typhoid Intestinal Perforation at the University Clinics of Lubumbashi. About 55 Cases.
- [15] Magagi, I.A., Adamou, H., Habou, O., Magagi, A., Halidou, M. and Ganiou, K. (2016) Digestive Surgical Emergencies in Sub-Saharan Africa: Prospective Study of a Series of 622 Patients at the Zinder National Hospital, Niger. *Bulletin de la Société de Pathologie Exotique*, **110**, 191-197. <https://doi.org/10.1007/s13149-016-0499-9>
- [16] Gaye, I., Leye, P.A., Traoré, M.M., Ndiaye, P.I., Boubacar, E.H., Bah, M.D., *et al.* (2016) Perioperative Management of Abdominal Surgical Emergencies in Adults at

- Aristide Le Dantec University Hospital. *Pan African Medical Journal*, **24**, Article No. 190. <https://doi.org/10.11604/pamj.2016.24.190.9929>
- [17] Kassegne, I., Sewa, E.V., Kanassoua, K.K., Alassani, F., Adabra, K., Amavi, A.K., *et al.* (2016) The Diagnostic, Therapeutic and Prognostic Aspect of Typhoid Perforations of the Small Intestine. *Tropical Medicine and Health*, **26**, 71-74. <https://doi.org/10.1684/mst.2016.0544>
- [18] Adamou, H., Amadou, M., Ibrahim, M., Habou, O., *et al.* (2015) Diagnostic Delay and Prognostic Implication in the African Environment. Cases of Digestive Surgery Emergencies at the Zinder National Hospital, Niger. *European Scientific Journal*, **11**, 251-262.
- [19] Choua, O., Kaboro, M., Ali Moussa, M.M., *et al.* (2015) Results of Treatment of Sigmoid Volvulus in N'Djamena, Chad. *European Scientific Journal*, **11**, 245-253.
- [20] Harouna, Y., Yaya, H., Abarchi, H., Rakoto Malala, J. and Gazi, M. (2000) Intestinal Obstructions: Main Causes and Morbidity-Mortality at the National Hospital of Niamey Niger, Prospective Study of 124 Cases. *Médecine d'Afrique Noire*, **47**, 204-207.
- [21] EL Bachir, B., Hasnai, H.D., *et al.* (2012) Colon Trauma: The Experience of the Fez University Hospital. *Pan African Medical Journal*, **13**, Article No. 61.
- [22] Ayite, A., Dosseh, E., Etey, K., Senah, K. and Napo-Koura, J.K. (1996) Cancers of the Small Intestine at the University Hospital of Lomé (Togo) about 8 Cases Observed in 10 Years. *Black African Medicine*, **43**, 534-537.
- [23] Togo, A., Coulibaly, Y., Kanté, L., Traoré, A., Diango, D.M., Keita, M., *et al.* (2009) Peritonitis Due to Typhoid Perforations at the Gabriel-Touré University Hospital in Bamako (Mali). *Journal Africain d'Hépatogastroentérologie*, **3**, 198-202. <https://doi.org/10.1007/s12157-009-0132-7>
- [24] Kouame, J., Kouadio, L. and Turquin, H.T. (2004) Typhoid Ileal Perforation Surgical Experience of 64 Cases. *Acta Chirurgica Belgica*, **104**, 445-447. <https://doi.org/10.1080/00015458.2004.11679590>