



Morbidity and Mortality of Hartmann's Procedure for Sigmoid Volvulus at the University Hospital of Cocody, Abidjan

Morbidité et Mortalité de la Procédure de Hartmann Volvulus Sigmoïde à L'hôpital Universitaire de Cocody, Abidjan

A. B. F. Kassi*, R. Lebeau, K. S. Yenon, E. Katché, B. Diané, J. C. Kouassi

ABSTRACT

BACKGROUND: The restoration of intestinal continuity following Hartmann's procedure is associated with high morbidity and mortality rates and low restoration rate.

OBJECTIVE: To determine the causes of complications and deaths associated with Hartmann's procedure and the secondary restoration of digestive continuity for sigmoid volvulus.

METHODS: This was a retrospective study involving 25 patients treated for sigmoid volvulus according to Hartmann's procedure, from January 1998 to January 2008; at the Cocody University Hospital, Abidjan (Côte d'Ivoire). The mortality and morbidity rates were assessed on the basis of the age, the duration of illness, the ASA (American Society of Anesthesiologists) score, the state of the sigmoid colon and peritoneal cavity.

RESULTS: The mean age of the patients was 42.52 years (range: 22–77 years). The mean duration of illness was 02.80 ± 0.71 days (range: 06 hours to 07 days). Sixteen (64%) of the patients had an ASA score lower than III. The mean length of intervention was 209.75 min. ± 102.530 min. (range: 120 min. to 327 min). The mortality rate was 12% (n=3) in the Hartmann's procedure. The necrosis state of the sigmoid colon was not significantly associated with a higher death risk ($p=0.071$) but the contamination of the peritoneal cavity by stools ($p=0.001$) or an ASA score ≥ 3 ($p=0.036$) was significantly associated with a higher death risk. Infections of the operative site (42.86%) were the most common complications. The mean length of hospital stay was 12.05 ± 25.45 days. Eleven patients (50%) out of 22 had the intestinal continuity restored. The median time of restoration was 3.43 months (range: 3–12 months). The mortality rate among the restoration group was nil and the morbidity rate was 27.27% represented by parietal suppurations only. The mean length of hospital stay was 14 ± 2.83 days.

CONCLUSION: Hartmann's procedure remains associated with an significant mortality. Morbidity, essentially arises from infections of the operative site. However the restoration of the intestinal continuity remains a sure intervention with an acceptable morbidity. WAJM 2011; 30(3): 169–172.

Key words: Morbidity, mortality, Hartmann's procedure, sigmoid volvulus, restoration of the intestinal continuity.

RÉSUMÉ

CONTEXTE: La restauration de la continuité intestinale après intervention de Hartmann est associée à une morbidité et de mortalité élevés et des taux de restauration bas.

OBJECTIF: Déterminer les causes de complications et de décès associés à la procédure de Hartmann et le rétablissement secondaire de la continuité digestive pour volvulus sigmoïde.

MÉTHODES: il s'agissait d'une étude rétrospective portant sur 25 patients traités pour volvulus sigmoïde conformément à la procédure de Hartmann, à partir de janvier 1998 à janvier 2008; à l'hôpital l'Université de Cocody, Abidjan (Côte d'Ivoire). la mortalité et de morbidité ont été évalués sur la base de l'âge, la durée de la maladie, l'ASA (American Society of Anesthesiologists) partition, l'état du côlon sigmoïde et de la cavité péritonéale.

RÉSULTATS: l'âge moyen des patients était de 42,52 années (écart: 22-77 ans). la durée moyenne de la maladie était $02,80 \pm 0,71$ jours (extrêmes: 06 heures à 07 jours). seize (64%) des patients avaient un score ASA inférieur iii. la durée moyenne d'intervention a été 209,75 min. $\pm 102,530$ min. (Plage: 120 min. À 327 min). le taux de mortalité était de 12% (n = 3) dans la procédure de Hartmann. l'état de nécrose du côlon sigmoïde n'était pas significativement associée à un risque plus élevé de décès ($p = 0,071$) mais la contamination de la cavité péritonéale par des selles ($p = 0,001$) ou un score ASA > 3 ($p = 0,036$) était significativement associée à un risque plus élevé de décès. Les infections du site opératoire (42,86%) étaient les complications les plus courantes. la durée moyenne d'hospitalisation était de $12,05 \pm 25,45$ jours. Onze patients (50%) sur 22 avaient la continuité intestinale restaurée. le temps médian de la restauration était de 3,43 mois (extrêmes: 3-12 mois). le taux de mortalité parmi le groupe de restauration a été nulle et le taux de morbidité était représentée par 27,27% des suppurations pariétales seulement. la durée moyenne d'hospitalisation était de $14 \pm 2,83$ jours.

CONCLUSION: la procédure de Hartmann reste associée à une mortalité significative. morbidité, provient essentiellement des infections du site opératoire. Cependant, la restauration de la continuité intestinale reste une intervention sûre avec une morbidité acceptable. WAJM 2011; 30(3): 169–172.

Mots-clés: morbidité, mortalité, procédure hartmann, volvulus sigmoïde, restauration de la continuité intestinal.

INTRODUCTION

Hartmann's procedure is a life-saving procedure carried out in emergency¹ in case of mechanical obstruction of the colon when the local and/or general conditions do not allow an immediate restoration of the recto-colic continuity. It consists of performing a sigmoidectomy with closure of rectal stump and anastomosis of colon upstream to the skin. The restoration of intestinal continuity is carried out 4-6 months later. This intervention which is reputed to be simple is the cause of postoperative complications which can influence the prognosis for life and is characterized by a low restoration rate of the intestinal continuity.

The objective of this work was to identify the causes of complications and deaths associated with the Hartmann's procedure and the restoration of the colonic continuity in the treatment of sigmoid volvulus, who represented 56,4% of non traumatic colon emergencies in our country.²

SUBJECTS, MATERIALS, AND METHODS

The study was a retrospective one involving 25 patients treated for sigmoid volvulus using the Hartmann's procedure and the later restoration of the digestive continuity from January 1998 to January 2008. This study was carried out in the Digestive and Visceral Surgery Department of Cocody University Hospital, Abidjan (Côte d'Ivoire). All the patients operated on for sigmoid volvulus using the Hartmann's procedure during our study period were included in the study.

All the interventions according to Hartmann's procedure were performed on plain colons in emergency and under general anaesthesia by a median xiphopubic incision after resuscitation. The duration of procedure depended on fluid and electrolyte status and the patient's general condition. There were 14(56%) volvulus cases with necrosed sigmoid colon and 11(44%) non necrosed sigmoid colon. The peritoneal cavity was soiled by stools during manipulations in four cases. All the interventions ended by the cleaning of the peritoneal cavity followed by drainage. The later

restoration of the digestive continuity (second surgical intervention) was performed during a planned intervention.

The mortality and morbidity rates of both interventions (Hartmann's procedure and the restoration of the digestive continuity) were assessed on the basis of the following parameters: the age, duration of illness, ASA score, state of the sigmoid colon and peritoneal cavity. Morbidity was defined by non lethal postoperative complications (parietal abscess, decubitus complications, complications related to the surgical procedure) in 30 days time after one of these interventions. The analysis of the different parameters was performed separately for both interventions from data collected on a pre-established individual investigation card. Parameters were compared using Fisher's test and a value of $P < 0.050$ was considered significant. Data was analyzed using Epi Info 2000.

RESULTS

Clinical Features of Patients (Table 1)

The mean age of the patients was 42.52 years (range: 22–77 years) with a male predominance, 23(92%). Eighteen (72%) of the patients were in the age bracket from 20 to 50 years with a higher frequency between 35 and 50 years (40%). The mean duration of illness in these patients was 2.80 ± 0.71 days (range: 6 hours to 7 days). Thirteen (52%) of our patients had an ASA score equal to II, nine (36%) had an ASA score equal to III. Three (12%) had an ASA score equal to I and none of them had an ASA score equal to IV. Sixteen (64%) of the patients had an ASA score lower than III. The mean length of intervention was 209.75 min. ± 102.530 min. (range: 120 min. and 327 min.).

Deaths

Three (12%) deaths were recorded during the first Hartmann's procedure. The first death occurred on post-operative day 01 following a cardiovascular shock. The second death occurred on day 05 following a haemodynamic instability and the third patient died on day 19 from an intraperitoneal abscess. The mean duration of illness of the dead patients was 2.33 ± 1.41 days.

These dead patients presented an ASA score equal to III, a non necrosed sigmoid colon and a peritoneal cavity contaminated by stools. The mean intervention length was 194.67 min. ± 16.97 min. The necrosed or non necrosed state of the sigmoid colon was not significantly associated with a high death risk ($p=0.071$) but the contamination of the peritoneal cavity by stools ($p=0.001$) or an ASA score $>III$ ($p=0.036$) was significantly associated with a higher death risk.

Complications occurred in seven patients (31.82%) in the Hartmann's procedure. One stomy necrosis which required a restoration of the stomy, one postoperative peritonitis with stomy necrosis which required a second intervention with restoration of the stomy and three parietal suppurations

Table 1: Clinical Features and Mortality of Patients

Clinical Feature	Dead Patients	Living Patients
Mean age (years)	42–50	57–50
Mean Duration of illness (days)	2–80	2–33
Non necrosed colon (Number)	8	3
Necrosed colon (Number)	14	0
Non peritoneal contamination (N)	21	0
Peritoneal contamination (N)	1	3
ASA I	3	0
ASA II	13	0
ASA III	0	3
ASA IV	0	0
Mean length of intervention(min)	209.75	194.67

Table 2: Patient's Outcome after Hartmann's Procedure

Outcome	Cases N(%)
Restoration of intestinal continuity	11(50)
Non restoration of intestinal continuity (patients lost to follow-up)	11(50)
Total	22(100)

which responded positively to local treatment. Other complications included an ileus prolonged beyond day 04 which subsided with a transit regulator, and a haemorrhage at the level of the median incision that required hemostatic sutures. A second hospitalisation was necessary in a patient discharged on day 12 and who presented with rectal haemorrhage with shock on day 21 and in whom the rectoscopy didn't find any cause. This rectal haemorrhage stopped spontaneously.

Hospital Stay and Follow-Up

The mean length of hospital stay was 12.05 ± 25.45 days (range: 06–43 days). 11 patients out of 22 had had a restoration of the digestive continuity by a colorectal anastomosis (second intervention) which was manual in 10 (90.91%) cases. The other patients (50%) had been lost to follow up (Table 2).

The mean restoration time of the intestinal continuity was 5.45 ± 0.707 months (extremes: 2 and 11 months). The mortality rate of the restoration was nil. Three (27.27%) patients had complications which were represented by parietal suppurations only. The mean length of hospital stay (second intervention) was 14 ± 2.83 days (range: 7 and 25 days).

DISCUSSION

Mortality Associated with Hartmann's Procedure

In our study the mortality rate of Hartmann's procedure was 12%, which was close to those reported by Dumont *et al*¹ and Desai *et al*³ of 14%. However this rate differs from the mortality rate of 5% in the series of Touré *et al*⁴ who noted two deaths out of 37 cases. Dead patients' mean age was higher than the average of the series (57 ± 5.66 years). Two patients out of the three who died were more than 60 years old. The presence of a contaminated peritoneal cavity or an ASA > III was related to a significantly higher death risk in our study. This fact was also reported in a French prospective multicenter study which concluded that, age older than 70 years, the existence of an associated pathology (diabetes, neurological or psychiatric pathology, cardiovascular pathology), long duration

of operation, and peritoneal contamination were related to a significantly higher death risk.⁵ This shows the importance of postoperative resuscitation and the implementation of postoperative strict asepsis measures. However the absence of necrosis is inconsistent with the mean duration of illness which was 02.33 ± 1.41 days. A delayed consultation, beyond six hours results in necrosis of the volvulate loop because of resultant ischaemia. In our study the delayed consultation of over 48 hours could explain the high death rate of 12%. However, this mortality rate differs from reports in the literature which reveal a mortality rate ranging between three and 10% in the absence of necrosis^{6,7} and a mortality rate of 11 and 33% in the case of sigmoid necrosis.⁸

Morbidity Associated with Hartmann's Procedure

The over all hospital morbidity of Hartmann's procedure was 31.82%, mostly due to surgical complications. The most common complications were abscesses of the wall (42.86%). They all responded positively to daily antiseptic dressing. However we should not ignore the fact that these infections of the operative site have their specific morbidity which has been reported in other studies.⁹ Complications increased hospitalisation time after the colectomy (9.73 ± 0.71 days in the absence of complications versus 15.67 ± 24.04 days in case of complications).

Eleven (50%) patients had had a restoration of the intestinal continuity (second intervention). These consisted of a manual colorectal anastomosis in general (90.91%) after a mean time of 5.5 ± 0.7 months and only three patients had had a restoration of the digestive continuity in a time of < three months. This rate is close to the one of Albarran *et al*¹⁰ who noted a restoration rate of 54% but which is lower than the value of other authors^{1,4} who reported 77% to 100% of restoration rate.

Patients lost to follow up were considered as patients who had not had a restoration of the digestive continuity though this eventuality is unlikely because of the psycho-social effect of stomies in Africa. This low rate of restoration could be due to the absence of health insurance.

Restoration Surgery

Almost all of the patients who had their digestive continuity restored (90.91%) had had a manual colorectal restoration. Some authors recommend the laparoscopic approach¹¹ provided there are only few adhesions and the time between the colectomy and the restoration is not too short. The advantage of this approach is that it reduces hospitalisation time and avoids parietal complications of laparotomy. This approach could have been used in our patients if the technical equipment was available. A restoration time of three to four months seems acceptable on the one hand to reduce postoperative peritoneal adhesions and on the other hand to prevent an important retraction of the rectal stump. Authors like Gallot and Baudot,¹² recommend a period of 90 days before the restoration of the digestive continuity which is well below the five months of our series. This long time before the restoration of the colorectal continuity was due to reasons mentioned earlier.

The mortality rate due to the restoration was nil. This rate is similar to many surveys^{1,3,10,13} and can be explained by the fact that it is about planned interventions, elective surgical procedures carried out after the correction of possible defects discovered during the first intervention. The morbidity of the second intervention was associated with abscesses of the wall in three patients out of the 11 patients. This situation requires strict asepsis rules as stressed earlier.⁹ The mean length of hospital stay which was $14 \text{ days} \pm 02.83 \text{ days}$ was close to the one of Dumont *et al*¹ who noted $10 \text{ days} \pm 03 \text{ days}$.

Conclusion

Henri Hartmann's procedure is a life-saving procedure in elderly patients presenting with debilitation or in poor general condition with a sigmoid volvulus. An age >60 years, an ASA score >III and a peritoneal cavity contaminated by stools appear to be mortality risk factors. Morbidity is essentially due to parietal suppurations. The restoration rate of the intestinal continuity remains low, even after a

period which is often more than three months. However the restoration of the digestive continuity remains a reliable intervention with an acceptable morbidity. Knowledge of the risk factors could help surgeons manage cases.

REFERENCES

- Dumont F, Vibert E, Duval H and all. Morbimortalité de l'intervention de Hartmann pour péritonite diverticulaire. Étude rétrospective multicentrique à propos de 85 patients. *Ann Chir* 2005; **130**: 391–9.
- Yenon KS, Lebeau R, Koffi E, Diané B, Kassi BF, Kouassi JC. Morbidité et mortalité postopératoire des urgences coliques non traumatiques. *Mali Méd.* 2008; **23**: 38–42.
- D. Desai, E Brennan, Jr, J Reilly, R. Smink, Jr. The utility of the hartmann procedure. *Am J Surg.* 1998; **175**: 152–4.
- Touré CT., Dieng M, Mbaye M, Sanou A , Ngom G, Ndiaye A, Dia A. Résultats de la colectomie en urgence dans le traitement du volvulus du côlon au centre hospitalier universitaire (CHU) de Dakar. *Ann Chir* 2003; **1**: **128**: 98–101.
- Alves A, Panis Y, Mathieu P, Mantion G, Kwiatkowski F, Slim K, et al. Postoperative mortality and morbidity in French patients undergoing colorectal surgery. *Arch Surg* 2005; **140**: 278–83.
- Koffi E, Lebeau R, Diané B, Kouassi JC. Traitement du volvulus du côlon sigmoïde: à propos de d'une série consécutive de 100 cas. *Science et Technique, Science de la santé* 2001; **24**: 107–112.
- Bagarani M, Conde AS, Longo R, Italiano A, Terenzi A, Ventura G. Sigmoid volvulus in west africa :a prospective study on surgical treatments. *Dis Colon Rectum* 1993; **36**: 186–190.
- Kuzu MA, Aslar AK, Soran A, Polat A, Topcu O, Hengirmen S. Emergent resection for acute volvulus: results of 106 consecutive cases. *Dis colon Rectum* 2002; **45**: 1085–1090.
- Yénon KS, Lebeau R, Koffi E, Diané B, Kassi BFA, Kouassi JC. Morbidité et mortalité post-opératoire des urgences coliques non traumatiques, a propos de 85 interventions. *Mali méd* 2008; **23**: 38–42.
- Albarran SA, Simoens Ch, Takeh H, Mendes da Costa P. Restoration of digestive continuity after Hartmann's procedure. *Hepatogastroenterology* 2004; **51**: 1045–9.
- Vacher C, Zaghloul R, Borie F, Laporte S, Callafe R, Skawinski P, et al. Rétablissement de la continuité digestive après intervention de Hartmann par voie laparoscopique. Étude rétrospective de la Société française de chirurgie endoscopique (SFCE). *Ann Chir* 2002; **127**: 189–192.
- Gallot D et Baudot PH – Colostomie, 11 – 1987, 10 Encycl Med Chir (Paris, France), Techniques chirurgicales, Appareil digestif, 40540, p.
- Roque-Castellano Joaquin C, Marchena-Gomez, Hemmersbach-Miller M, Acosta-Merida A, Rodriguez-Mendez A, Fariña-Castro R, et al. Analysis of the factors related to the decision of restoring intestinal continuity after Hartmann's procedure. *Int J Colorectal Dis* 2007; **22**: 1091–6.