

Full Length Research Paper

Morbidity and mortality in colorectal surgery

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The aim of the study was to determine the factors of morbidity and mortality of colorectal surgery in a visceral surgery service. In a prospective study performed from 15 December 2008 to September 15, 2009, the authors recorded all patients who underwent colorectal resection. They studied the morbidity and mortality rates using the 4 risk factors identified by the French Association of Surgery (AFC) criteria. Sixty-two patients were included in the study. There was a slight male predominance (sex ratio=1.14). The median age was 67.76 years (range 37-89 years). The patients were operated mainly for colorectal cancer. The postoperative course was complicated in 17 cases (morbidity = 27.4%). None of the criteria of morbidity of colorectal surgery was verified. The overall mortality rate was estimated at 11.29%. Only the age criterion (age > 70 years) was significantly checked as a criteria of colorectal surgery mortality ($p < 0.02$). Advanced age is a factor of mortality of colorectal surgery.

Keywords: Colorectal surgery, mortality, morbidity, colorectal cancer, diverticulitis, polyps.

INTRODUCTION

Colorectal surgery is associated with high mortality and morbidity (Ansari et al., 2000; Biondo et al., 2005; Tekkis et al., 2003). Their preoperative assessment by simple criteria was established by a survey of AFC, the French Association of Surgery (Alves et al., 2005). Colorectal surgery is the cause of some postoperative complications that are observed in our department. The aim of this study was to determine the factors of morbidity and mortality of colorectal surgery evaluated by AFC criteria.

PATIENTS AND METHODS

Sampling

This prospective study was conducted between December 15, 2008 and September 15, 2009 in the visceral surgery department of the hospital of Valence. All patients who underwent colorectal resection with or

without restoration of digestive continuity have been recorded.

Technique

The intervention was made by laparotomy. After mobilization of the colon, arteries were tied at their origin, especially when it was a malignant tumor. Colonic resection and anastomosis (mechanical or manual according to the desire of the surgeon) were followed by a protective stoma according to the local state of the colon. Antibiotic prophylaxis was administered during anesthetic induction and repeated if necessary. The drainage of the peritoneal cavity was systematic.

Variables

The variables studied were: age, sex, ASA score, neurological history, type of intervention, complications (wound infection, deep abscess, fistula), and duration of the hospitalization.

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Table 1. Socio-demographic characteristics of patients

Specifications		Number	Percentage (%)
Age	<70 years	30	49
	≥ 70 years	32	51
Sex	Female	29	47
	Male	33	53
ASA Score	1	5	8.1
	2	30	48.4
	3	26	41.9
	4	1	1.6

Table 2. Terms of the anastomosis according to the indication and type of intestinal resection

Indication	Intestinal resection *	Anastomosis			Number	Total %
		Immediate	Delayed	Non realized		
Diverticulitis	LC	2	2	0	11	17,8
	SR	2	5	0		
Cancer	LC	8	7	1	48	77,4
	RC	17	2	1		
	AR	5	2	0		
	APA	0	0	3		
	SC	1	0	1		
Polyps	SC	3	0	0	3	4,8
Total		38	18	6	62	100,0

* LC = left colectomy, SR = sigmoid resection, RC = right colectomy, AR = anterior resection, APA = abdomino-perineal amputation, SC = subtotal colectomy

Definitions

Postoperative mortality included deaths occurring in hospital or within 6 months after surgery.

Morbidity included all postoperative events requiring treatment.

An anastomotic fistula was defined as a digestive liquid flow through a surgical scar or a drain. It could also be diagnosed during a reoperation or a CT scan showing an anastomotic leak.

A deep abscess was a deep infected collection with an infectious syndrome, highlighted by ultrasound or computed tomography and requiring antibiotics linked or not to a surgical drainage.

A wound infection was a collection of parietal pus requiring partial or total opening of the scar, or erythema of a scar requiring antibiotic treatment.

The recovery of transit was assessed by the issue date of the first gas and the issue date of the first stool.

Morbidity and mortality were studied according the four risk factors of mortality identified by AFC: the urgency of surgery, neurological history, weight loss above 10% and age over 70 years (Alves et al., 2005). These criteria are accessible before surgery.

Statistical analysis

Values were expressed as mean and percentage. The subgroups of patients were compared using the χ^2 test. Variables with *P* values of less than 0.05 were considered significant.

RESULTS

Sociodemographic characteristics

Sixty two patients were included into this study. There was a slight male predominance (sex ratio=1.14) showed by table 1 above. Their median age was 67.76 years (range 37-89 years). The patients were operated mainly for colorectal cancer. The intervention was conducted in emergency for third of patients: 14 cases of cancer out of 48 (29.2%) and 6 cases of diverticulitis out of 11 (54.5%). The ASA (American Society of Anesthesiologists) was 2 or 3 in 90% of the cases.

The restoration of digestive continuity was not performed for 6 patients (9.6%). Three of them had an abdomino-perineal amputation with definitive stoma and the 3 others died (Table 2).

Table 3. Risk factors for morbidity

Risk factors		Patients	Complications		p
			Number	%	
Age	<70 years	30	7	23.3	ns
	≥70 years	32	10	31.2	
Neurologic history	Absent	61	17	27.9	-
	Present	1	0	0.0	
Weight lost >10%	Absent	50	14	28.0	ns
	Present	12	3	25.0	
Mode of admission at operating room	Emergency	20	3	15.0	ns
	Program	42	14	33.3	

Table 4. Risk factors for mortality

Risk factors		Overall patients	Patients who died		p
			Number	%	
Age	<70 years	30	0	0.0	0.02
	≥70 years	32	7	22	
Neurologic history	Absent	61	6	10	-
	Present	1*	1	100	
Weight lost >10%	Absent	50	4	8	ns
	Present	12	3	25	
Mode of admission at operating room	Emergency	20	2	10	ns
	Program	42	5	12	

* Stroke

A protective stoma was performed 4 times after immediate anastomosis. The median length of stay was 22 days (range 8-86 days).

Morbidity

The postoperative course was uneventful for 45 patients (72.6%) and 21 complications were observed in 17 patients. The overall morbidity was 27.4%. Complications were dominated by parietal suppuration and septic shock (4 cases each). Two anastomotic fistulas (3.23%) were diagnosed: one of them required a surgical revision on the 8th postoperative day, the other one was treated by dressings. A postoperative obstruction occurred and was treated medically at the end of the 2nd month. An iatrogenic intraoperative ureteral wound was sutured and drained. None of the AFC criteria of morbidity of colorectal surgery was verified (Table 3).

Mortality

The overall mortality was 11.29%. Age above 70 years had been identified as a factor of mortality, with $p < 0.02$ (Table 4).

DISCUSSION

In Europe, where the population is aging, the median age of patients treated for colorectal disease varies according to the authors, 60 to 70 years (Duval et al., 2006; Perniceni et al., 2000). By cons, in Africa, the median age of patients is lower, 40 to 50 years (Yénon et al., 2008; Benamr et al., 1996). There is a male predominance found by several studies (Duval et al., 2006; Yénon et al., 2008).

Overall, morbidity of colorectal surgery varies around 20-30% (Cossa et al., 2008). It is sometimes lower, from 14 to 19% (Perniceni et al., 2000) or higher, about 38, 8% (Yénon et al., 2008). It is mainly a parietal suppuration (Haouet et al., 2000).

Overall, mortality in our series (11.29%) is similar to that found in the AFC survey population (Alves et al., 2005). The operation in emergency is the main risk factor of mortality in the AFC survey (Alves et al., 2005) as well as in other studies (Biondo et al., 2005). In addition, emergency surgery has a bad prognosis in elderly patients as demonstrated by Poon et al who found a 5% mortality before age 70 and 10% over 70 years (Poon et al., 2005). We can say with the authors that operative mortality increases with age (Alves et al., 2005; Cossa et al., 2008; Saint-Louvent, 2000). The functional alterations

and physiology in the elderly probably do not allow them to fight effectively against potential postoperative complications like young subjects.

CONCLUSION

Our study included 62 patients undergoing colorectal surgery. The average age of patients was 67.76 years with extremes of 37 and 89. The overall morbidity is 27.42%. The overall mortality rate is 11.29%. Advanced age is a factor of mortality of colorectal surgery.

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