

Results of Surgical Management of Malignant Obstruction of the Common Bile Duct in Yaoundé

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Abstract

Introduction: In Cameroon, surgery remains the only approach in malignant obstructions of the common bile duct (MOCBD) even in palliative situations. The aim of this work was to describe the modalities of surgical treatment of MOCBD, evaluate the results and detect the factors associated with postoperative morbidity and mortality. **Patients and Methods:** We conducted an analytical observational study, with retrospective data collection from the files of patients operated upon for MOCBD. This was done in four referral hospitals in the city of Yaoundé for a 42-month period spanning from January 1, 2020 to June 30, 2023. Demographic data, clinical presentation, surgical data, and 30-day postoperative outcomes were collected. **Results:** We collected 71 files. The sex ratio was 1.4 and the mean age was 56 ± 11 years. Fifty-three (53) patients (74.6%) were overweight or obese and 10 patients (14.1%) were hypertensive. A clinical cholestasis syndrome was present in 69 patients (97.2%). Fifty-five (55) patients (77.5%) had a cancer of the head of the pancreas, 8 patients (11.3%) had an extra-hepatic cholangiocarcinoma and 8 patients (11.3%) had an ampullary adenocarcinoma. Eight (8) resections (11.3%) with curative intent had been carried out and in 63 cases (88.7%), surgery was palliative. Postoperative morbidity was 55.7%, influenced by advanced WHO stage ($p = 0.02$). Postoperative mortality was 25.7%, associated with a high ASA score ($p = 0.01$). **Conclusion:** Pancreatic head cancer is the main etiology of malignant obstructions of the common bile duct in Cameroon. Surgical treatment is most often palliative. Postoperative morbidity and mortality are high, influenced by high WHO and ASA scores.

Keywords

Malignant Obstruction, Common Bile Duct, Palliative Treatment, Morbidity, Mortality

1. Introduction

Obstructive jaundice is a common situation in medical practice. The causes are multiple and can be benign or malignant. Malignant obstructions are found in proportions ranging from 29.8% to 72.5% depending on the studies [1] [2] [3] [4]. The most common malignant causes are pancreatic head cancer, cholangiocarcinoma and ampullary neoplasia [1] [2]. Gallbladder cancer is frequently found as an etiology in certain series [1] [2]. Patients with malignant obstructive jaundice generally present with advanced disease, with few tumors eligible for potentially curative surgical resection [5] [6]. They are therefore very often offered palliative treatments whose main objective is the relief of biliary obstruction [7]. Palliative surgical modalities include radiological percutaneous drainage, endoscopic drainage and surgical biliary bypass. Each of these treatments has advantages and disadvantages. In general, non-surgical palliative methods should be preferred in people with poor performance status, ascites and/or life expectancy less than 4 to 6 months [8].

In Cameroon, malignant obstructive jaundice represents 60% and 63.6% respectively according to two studies [9] [10]. Digestive cancers are diagnosed late with 71.3% metastatic forms at diagnosis [11]. Bile duct tumors are quite rare [11] [12]. In a retrospective study carried out by Bang *et al.* [13] on 105 pancreatic head cancers, 53 patients (50.5%) had surgical treatment and 2 patients (1.9%) had tumor resection. However, in another prospective series, the same author found a tumor resection rate of 20.8% for pancreatic cancers, in all locations combined [12]. Furthermore, in the case of an unresectable tumor, surgical treatment is the only therapeutic option available to relieve biliary obstruction in these patients, as radiological and endoscopic treatments are not yet available in Cameroon. The aim of this study was to describe the modalities of surgical treatment of malignant obstructions of the common bile duct (MOCBD), evaluate the results and detect the factors associated with postoperative morbidity and mortality.

2. Patients and Methods

We conducted a multicenter analytical cross-sectional study in 4 hospitals in Yaoundé (Cameroon): Yaoundé General Hospital, Yaoundé Central Hospital, Yaoundé Teaching Hospital and Essos Hospital Center. These are 1st and 2nd category hospitals in the national health pyramid and university hospitals with digestive surgery, medical and surgical emergency, gastroenterology and medical oncology departments.

We reviewed the operative and hospitalisation registers in these hospitals to identify patients operated upon for MOCBD for a 42-month period spanning from January 1, 2020 to June 30, 2023. We retained the files of patients of both sexes over 15 years old. Unusable (incomplete or not found) files were excluded. Socio-demographic, clinical, paraclinical, therapeutic and evolutionary data of the patients were collected. The results of the operation should be known within 30 days following surgery.

Data analysis was carried out using Microsoft Office Excel 2016, CS Pro 7.7 and SPSS 20 software. Quantitative data were expressed as means and standard deviations and qualitative variables were reported as frequency and percentage. Risk factors of morbidity and mortality were grouped and statistical difference between groups was analysed using Fisher's test. Logistic regression analysis was applied on the statistically significant variables in the test and factors affecting morbidity and mortality determined. The statistical significance for these tests was set at $p < 0.05$.

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° 0550/Uyi/FMSB/VDRC/DAASR/CSD of August 28, 2023. All authorizations were obtained from the managers of the different sites selected for the study.

3. Results

During the study period, 79 patients were operated for MOCBD in the different surgical departments selected for the study. Eight (8) files (10.1%) were unusable.

We therefore collected 71 files, representing an average annual hospital incidence of 5.1 patients. There were 42 men (59.2%) and 29 women (40.8%), for a sex ratio of 1.4. The average age of the patients was 56 ± 11 years with extremes of 25 and 73 years. Forty-five (45) patients (63.4%) were over 55 years old. Regarding comorbidities, 53 patients (74.6%) were overweight or obese, 18 patients (25.4%) regularly consumed alcohol and 10 patients (14.1%) were hypertensive. The sociodemographic and epidemiological characteristics of the patients are summarized in **Table 1**.

All patients had consulted for suggestive symptoms related to their disease. A clinical cholestasis syndrome was present in 69 patients (97.2%). Other symptoms included epigastric pain in 28 cases (39.4%) and weight loss in 24 cases (33.8%). Thirty-two (32) patients (45.1%) had a WHO performance status of 3 and 4. An abdominal mass was found in 4 patients (5.6%). The clinical characteristics of the study population are reported in **Table 2**. Morphologically, an abdominal or thoraco-abdominopelvic CTscan was performed in 63 patients (88.7%). It found a suspicious mass in 53 cases, a suspicious stenosis of the common bile

Table 1. Socio-demographic characteristics and epidemiology of the study population.

Variables	Numbers	Percentage
Sex		
Men	42	59.2
Women	29	40.8
Age (years)		
≤35	6	8.5
]35 - 55]	20	28.2
>55	45	63.4
Comorbidities/Risk Factors		
HIV	4	5.6
Diabetes	6	8.5
Hypertension	10	14.1
Alcohol	18	25.4
Tobacco	11	15.5
BMI		
<18.5	2	2.8
[18.5 - 25[16	22.5
[25 - 30[27	38
≥30	26	36.6

Table 2. Clinical data of the study population.

Variables	Numbers	Percentage
Circumstances of discovery		
Suggestive symptoms	71	100
Complications	0	0
Fortuitous discovery	0	0
Functional signs		
<i>Cholestasis syndrome</i>		
Jaundice	69	97.2
discolored stools	47	66.2
Dark urine	57	80.3
Pruritus	45	63.4
<i>Other functional signs</i>		
Epigastric pain	28	39.4
Diarrhea	2	2.8

Continued

Weightloss	24	33.8
Fever	6	8.5
Melena	2	2.8
WHO performance status		
≤2	39	54.9
>2	32	45.1
Physical signs		
Abdominal distension	4	5.6
Hepatomegaly	11	15.5
Abdominal mass	4	5.6
Courvoisier Terrier's sign	24	33.8
ASA classification		
≤2	6	8.5
>2	65	91.5
Etiological diagnosis		
Pancreatic head cancer	55	77.5
Extrahepatic cholangiocarcinoma	8	11.3
Ampullary adenocarcinoma	8	11.3
cTNM stage		
Stage I	4	5.6
Stage II	31	43.7
Stage III	16	22.5
Stage IV	20	28.2

duct in 2 cases and a dilatation of the bile ducts in 55 cases. The data from the morphological assessment of the study population are summarized in **Table 3**. Thirty-two (32) patients (45.1%) had moderate to severe preoperative anemia and hypoalbuminemia was present in 24 cases (33.8%). Biological cholestasis syndrome was present in all cases. A preoperative biopsy was only performed in 4 patients (5.6%) presenting a mass in the second duodenum. In all 4 cases, it was an ampullary adenocarcinoma. The etiological diagnosis of MOCBD mentioned preoperatively was pancreatic head cancer in 55 (77.5%) cases, extra-hepatic cholangiocarcinoma in 8 cases (11.3%) and ampullary adenocarcinoma in 8 cases (11.3%). At diagnosis, 16 patients (22.5%) and 20 patients (28.2%) were classified respectively as cTNM 3 and cTNM 4.

Therapeutically, no patient had received preoperative chemotherapy. Sixty-five (65) patients (91.5%) were classified ASA 3 and 4. The approach was

Table 3. Morphological data.

Variables	Abdominal or TAP CT scan (N = 63)	Abdominalechography (N = 22)	MRI (N = 11)
Dilatation of the bile ducts	55	18	11
Suspicious mass	53	6	7
Suspected stenosis	2	0	4
Metastases	18	4	5
Lymph nodes	0	3	2

by laparoscopy in 18 cases (25.4%) and by laparotomy in 53 cases (74.6%), including a midline incision in 39 patients and a bi-subcostal incision in 14 patients. Operative findings were peritoneal carcinomatosis in 4 cases and hepatic nodules in 11 cases. Ascites and invasion of neighboring organs were present in 17 and 14 cases respectively. Eight (8) resections (11.3%) with curative intent were performed. It involved a cephalic duodeno-pancreatectomy in 6 cases (2 cases with pancreatic head cancer and 4 cases of ampullary adenocarcinoma) and 2 cases of biliary resection with hepatico-jejunal anastomosis. In the other 63 cases (88.7%), surgical treatment was palliative. The different therapeutic modalities are given in **Table 4** and **Table 5**.

We recorded one intraoperative death following an uncontrolled drop in blood pressure. In the 30 days following surgery, 39 patients had experienced at least one complication, representing a postoperative morbidity of 55.7% (**Figure 1**). **Figure 2** gives Clavien Dindo's classification of the different complications. The most frequent complication was a biliary fistula (14 cases) treated by external drainage with favorable outcome in 11 cases. Nine (9) cases of septicemia were recorded with a favorable outcome under antibiotics in 6 cases. We also recorded 3 cases of pancreatic fistula with a favorable outcome under external drainage and parenteral nutrition in 2 cases. Advanced WHO stage ($p = 0.02$) was negatively associated with the occurrence of complications (**Table 6**). Eighteen patients died within 30 days of surgery, resulting in a postoperative mortality of 25.7% and an overall mortality of 26.8%. The causes of postoperative death were multiorgan failure in 11 patients, sepsis in 3 cases, pulmonary embolism in 2 cases and a case of atrial fibrillation in a patient who had chronic heart disease. In one case, the cause of death was not specified. High ASA score ($p = 0.01$) negatively affected mortality in this series (**Table 7**).

4. Discussion

In this study, we present the different modalities of surgical treatment applied to MOCBD in 4 hospitals in the city of Yaoundé in Cameroon. This study shows that patients do not always receive the recommended treatment and surgical treatment is not always adapted to the stage of the disease. Postoperative morbidity and mortality are high. The multicenter nature of this study is a strength,

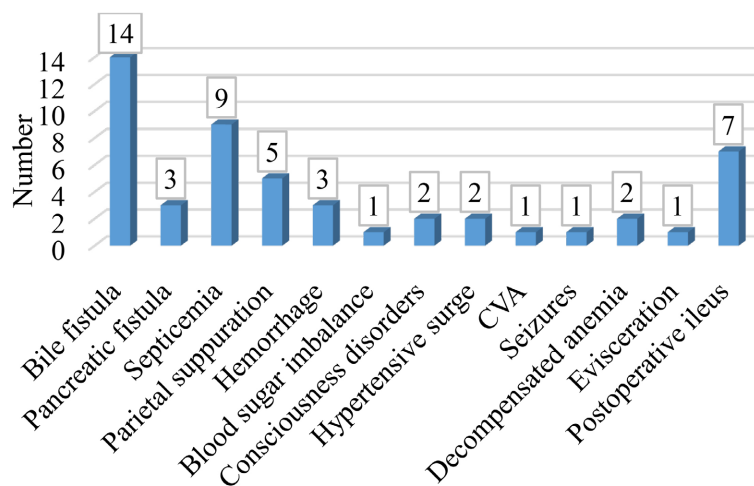


Figure 1. Postoperative complications.

Table 4. Surgical modalities and techniques.

Variables	Numbers	Percentage
Surgery with curative intent	8	11.3
Cephalic duodeno-pancreatectomy	6	
Biliary resection + Hepatico-jejunal anastomosis	2	
Palliative surgery	63	88.6
Choledocoduodenostomy (with associated gastro-enteroanastomosis)	41 (14)	
Choledocojejunostomy	14	
Cholecystojejunostomy	8	

Table 5. Surgical modalities and techniques depending on diagnosis and cTNM stage.

Variables	Surgery with curative intent	Palliative surgery
Diagnosis		
Pancreatic head cancer	2	53
Extrahepatic cholangiocarcinoma	2	6
Ampullary adenocarcinoma	4	4
cTNM stage		
Stage I	3	1
Stage II	5	26
Stage III	0	16
Stage IV	0	20

Table 6. Univariate analysis of factors associated with postoperative morbidity.

	Variables	Complications		OR (95% IC)	p-value
		Yes	No		
Age	≥55 years	26 (57.8)	19 (52.2)	1.02	1
	<55 years	13 (0.5)	13 (0.5)	(0.24 - 4.26)	
Sex	Men	21 (0.5)	21 (0.5)	0.50	0.33
	Women	18 (62.1)	11 (37.9)	(0.13 - 2.03)	
Comorbidities/ Risk factors	Hypertension	6 (60)	4 (40)	1.31 (0.19 - 9.02)	1
	Diabetes	4 (66.7)	2 (33.3)	1.77 (0.15 - 21.47)	1
	Tobacco	5 (45.5)	6 (54.5)	0.51 (0.07 - 3.51)	0.64
	Alcohol	13 (72.2)	5 (27.8)	4.08 (0.71 - 23.51)	0.14
BMI	Malnourished	2 (100)	0 (0)	-	1
	Normal	8 (50)	8 (50)	0.80 (0.17 - 3.89)	1
	Overweight/Obese	29 (54.7)	24 (45.3)	0.93 (0.20 - 4.29)	1
WHO performance status	Stages 3 and 4	17 (53.1)	15 (46.9)	10.91	0.02
	Stages 1 and 2	22 (56.4)	17 (43.6)	(1.19 - 100.41)	
ASA score	ASA >2	33 (50.8)	32 (49.1)	-	0.23
	ASA ≤ 2	4 (66.7)	2 (33.3)	-	
Diagnosis	Pancreatic head cancer	27 (49.1)	28 (50.9)	0.31 (0.05 - 1.82)	0.24
	Extrahepatic cholangiocarcinoma	5 (62.5)	3 (37.5)	0.82 (0.10 - 6.62)	1
	Ampullary carcinoma	7 (87.5)	1 (12.5)	-	0.11
cTNM stage	Stage I and II	22 (62.9)	13 (37.1)	2.29	0.23
	Stage III and IV	17 (47.2)	19 (52.8)	(0.59 - 8.94)	
Surgical treatment	Curative	7 (87.5)	1 (12.5)	-	0.11
	Palliative	32 (50.8)	31 (49.2)	-	

Table 7. Univariate analysis of factors associated with postoperative mortality.

	Variables	Complications		OR (95% IC)	p-value
		Yes	No		
Age	≥55 years	13 (28.9)	32 (71.1)	0.54	0.49
	<55 years	5 (19.2)	21 (80.8)	(0.09 - 3.16)	

Continued

Sex	Men	7 (16.7)	34 (83.3)	0.22	0.11
	Women	11 (37.9)	18 (62.1)	(0.04 - 1.12)	
Comorbidities/ Risk factors	Hypertension	4 (40)	6 (60)	2.19 (0.30 - 15.85)	0.59
	Diabetes	4 (66.7)	2 (33.3)	7.14 (0.56 - 90.80)	0.16
	Tobacco	1 (9.1)	10 (90.9)	-	0.30
	Alcohol	7 (38.9)	11 (61.1)	3.36 (0.65 - 17.27)	0.19
BMI	Malnourished	1 (50)	1 (50)	-	0.26
	Normal	2 (12.5)	14 (87.5)	0.34 (0.04 - 3.23)	0.65
	Overweight/Obese	15 (28.3)	38 (71.7)	1.29 (0.21 - 7.76)	1
WHO performance status	Stages 3 and 4	10 (31.3)	22 (68.7)	3.36 (0.65 - 17.27)	0.19
	Stages 1 and 2	8 (20.5)	31 (79.5)		
ASA score	ASA > 2	16 (24.6)	49 (75.4)	-	0.01
	ASA ≤ 2	2 (33.3)	4 (66.7)		
Diagnosis	Pancreatic head cancer	13 (23.6)	42 (76.4)	1.01 (0.17 - 6.46)	1
	Extrahepatic cholangiocarcinoma	3 (37.5)	5 (62.5)	0.96 (0.09 - 10.58)	1
	Ampullary carcinoma	2 (33.3)	6 (66.7)	0.96 (0.09 - 10.58)	1
cTNM stage	Stage I and II	11 (31.4)	24 (68.6)	2.73 (0.56 - 13.37)	0.26
	Stage III and IV	7 (19.4)	29 (80.6)		
Surgical treatment	Curative	4 (50)	4 (50)	3.43 (0.41 - 28.94)	0.27
	Palliative	14 (22.2)	49 (77.8)		

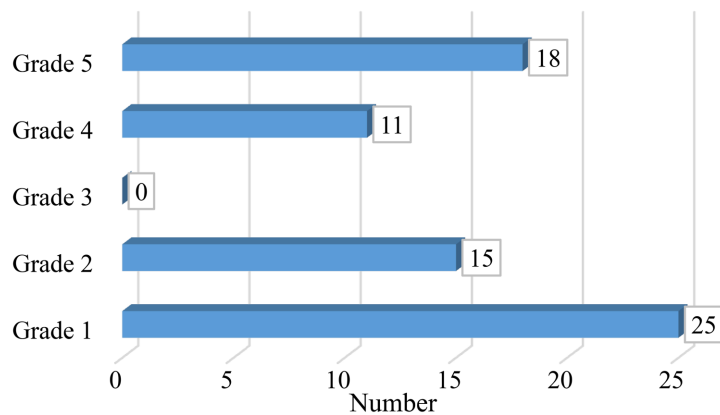


Figure 2. Clavien Dindo's classification of postoperative complications.

reflecting the attitudes and practices of several services and practitioners, although the patient numbers are quite small, with an average annual hospital incidence of 5.1 patients. One of the limitations of this study, however, is its retrospective nature, with all the shortcomings inherent in this type of data collection. This study was carried out in reference hospitals in the city of Yaoundé, the political capital of Cameroon, having fairly high technical platforms, and therefore does not always reflect surgical activity in other localities in the country. A larger sample extended to other localities in the country could make it possible to verify and validate these results.

The hospital incidence of malignant obstructive jaundice is low in Cameroon, as already reported in a study by Takongmo *et al.* [9] who collected 18 patients in 10 years and Nko'oAmvene *et al.* [10] who found 14 cases in 32 months. Di Bisceglie *et al.* [1] identified 18 cases in one year in a South African study. These figures are low, compared to those of international series [5] [14] [15] [16] [17] [18]. Dhananjaya *et al.* [19] however collected 36 cases in 5 years in India. The male predominance found in this study is reported by most of the authors [1] [2] [5] [9] [15] [16]. Dhananjaya *et al.* [19] instead found a female predominance (63.9%) in their series. MOCBD is the disease of the elderly as found in this series and many others in the literature [1] [9] [15] [18] [19]. Siddique *et al.* [2] had an average age of 49.5 years. In their series, there was a significant proportion of benign forms, these generally occurring in younger patients [1].

Pancreatic head cancer is the most common etiology in this series, as found by most authors [3] [4]. Other etiologies variably associate cholangiocarcinoma and ampullary carcinoma [4]. Gallbladder cancer is reported in certain studies in variable proportions [4] [5] [17]. Other authors have, by contrast, found a predominance of cases of cholangiocarcinoma [5] [16] [17]. Dhananjaya *et al.* [19] found a predominance of cases of gallbladder carcinoma (67.5%). Diagnosis is generally late in advanced stages and most often following suggestive signs, including cholestasis syndrome [13] [15] [20]. This method of revealing the disease concerned all the patients in this series and 50.7% of them had locally advanced or metastatic disease at diagnosis.

The rate of tumor resection associated with MOCBD is very low in the literature [5] [6] [9] [15] [19]. The diagnostic delay with a high prevalence of metastatic forms already mentioned above could be an explanation. Tumor resection only concerned 11.3% of patients in this series despite a proportion of 49.3% of localized forms. The surgical treatment of MOCBD is cumbersome and requires a certain expertise which does not always exist in Cameroon. The other patients underwent surgical palliation, endoscopic or radiological palliation not being available. Various approaches exist for the management of obstructive jaundice. The chosen method should be individualized to the patient and based on performance status, level of tumor obstruction, patient preferences and available expertise [8] [20]. The different palliative modalities should be used in very specific contexts [8]. In addition, palliative treatment of unresectable MOCBD targets three major symptoms: obstructive jaundice, duodenal obstruction and

cancer-related pain [21]. Surgical palliation is undoubtedly the modality capable of fulfilling this threefold objective. However, it is invasive and associated with significant morbidity and mortality [8]. Non-surgical palliation is therefore preferred [21] [22]. However, surgery still has its place. Indeed, even if the assessment of the non resectability of a tumor has been improved by the advances in preoperative explorations, including diagnostic laparoscopy, open surgery continues to serve as the standard for determining the resectability of a tumor [21]. Furthermore, in case of open exploration, surgical palliation is often indicated in the presence of non-metastatic and unresectable disease discovered intraoperatively [21]. The different bilio-digestive bypass techniques depending on the anastomosed digestive segments vary from one author to another. Despite the absence of duodenal obstruction in this series, a gastroenteroanastomosis was performed preventively in 14 patients.

Compared to literature data [5] [9] [14] [15] [16] [19] [23], postoperative morbidity and mortality in this series are very high. In most of these series, non-surgical palliation and benign obstructions occupy an important place. Procedures for benign lesions and non-surgical palliations are associated with lower morbidity and mortality [16] [21] [24]. High WHO and ASA scores were associated with the occurrence of complications and postoperative mortality in this study. Advanced WHO, ASA and Charlson stages are associated with high postoperative morbidity and mortality in several studies [8] [14] [18]. This series includes a significant proportion of patients with high WHO and ASA scores and non-surgical palliation should be preferred to them as recommended by Baron [8]. Other authors found that advanced age was associated with unfavorable surgical outcomes in their series [24] [25]. Nearly two in three patients in this series is over 55 years old. This could explain the high rate of postoperative complications and deaths, although age is not associated with the occurrence of such events. Improving these results requires the development of interventional medicine in Cameroon in order to adapt therapeutic modalities to the clinical profile of patients.

5. Conclusion

The hospital incidence of malignant obstructions of the common bile duct is low in Cameroon. The etiologies are dominated by pancreatic head cancer. Surgical treatment is most often palliative even in earlier disease. Postoperative morbidity and mortality are high, influenced by high WHO performance status and ASA score. Better patient selection and practitioner qualification could help improve these results.

Conflicts of Interest

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

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