

Revision of Surgical Management of Malignant Obstructive Jaundice at Al-Bashir Teaching Hospital in Amman – Jordan

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Abstract

Background: Malignant Obstructive Jaundice (MOJ) is caused by different diseases at different levels and stages. Ideally, the best management is by early diagnosis and treatment with multi-disciplinary approach that includes the full cooperation among endoscopists, histopathologists, interventional radiologists, oncologists and surgeons.

Objective: This analytic retrospective study puts a light on the management of MOJ patients at the surgical department of Al-Bashir Teaching Hospital in Amman – Jordan. The gradual changes in the surgical management were taken in consideration.

Method: The study included 98 patients who were treated surgically for MOJ during the period from June 1999 to June 2006. The age of these patients ranged from 27 years to 85 years, with the mean age being 62 years. The data obtained includes the investigations done, type, stage and level of MOJ, the type of surgical procedure and the postoperative complications within 1 month.

Results: Most of the patients were males, 58 patients with a percentage of (59.18%). The remaining 40 patients were females with a percentage of (40.82%). The types of surgical management included Whipple's procedure for 16 patients with a percentage of (16.33%), tumor resection for 3 patients with a percentage of (3.06%), bypass (palliative) procedures for 69 patients with a percentage of (70.41%) and the remaining 10 patients with a percentage of (10.20%) were found to be inoperable during diagnostic laparotomy. In general, the surgical management had a morbidity of (18.37% - 18 patients) of which the mortality was (14.28% - 14 patients of these 18 morbid patients). Regarding investigation, U/S was performed for 62 patients only. It was positive in 30 patients with a percentage of (48.39%). Endoscopic Retrograde Cholangiopancreatography (ERCP) was done in 34 patients, it was positive in 18 patients with a percentage of (52.94%). Abdominal CT scan was performed for 44 patients, it was positive in 38 patients with a percentage of (86.36%). MRCP was done in 14 patients, it was positive in 12 patients with a percentage of (85.71%).

Conclusion: MOJ is a disease occurring more frequently in middle age and elderly groups. Most of the patients are presented lately, making the most common surgical procedure performed for these patients being palliative (bypass) procedure. The use of sophisticated investigations is shown to aid in the diagnosis and staging of MOJ.

Keywords: Malignant Obstructive Jaundice, Al-Bashir Teaching Hospital, Amman.

Introduction

Malignant Obstructive Jaundice (MOJ) is concerned with a group of diseases defined according to the location of biliary obstruction into:

- A. Upper third, e.g. hepatocellular carcinoma (HCC) and cholangiocarcinoma (Klatskin Tumors).
- B. Middle third, e.g. cholangiocarcinoma, gall bladder adenocarcinoma (Figure 1) and extrinsic nodal compression e.g. (Lymphoma).
- C. Lower third, e.g. cholangiocarcinoma, ampullary carcinoma

(Figure 2), carcinoma of the head of pancreas, cancer of the duodenum and retroduodenal adenopathy.



Figure 1: CT Scan showing adenocarcinoma of the gall bladder.

Notes:

@ =not done. * =not available.



Figure 2: MRCP showing ampullary carcinoma.

Assessment of respectability and operability depends on diagnosis and staging preoperatively, this relies mainly on **Spiral CT Scan** which is considered a superior modality for pancreatic cancer. [1, 2, 3, 4]

Signs of advanced disease are ascites, liver metastasis, lymph node more than 2 cm in diameter and invasion to the adjacent organs. [5]

MRI-Based staging, along with **MRCP**, can further determine the subsequent choice of therapy, and in detecting cholangiocarcinoma spreading along the proximal biliary tree. [5,6,7]

CT Angiography* or **Duplex-Doppler Ultrasonography*** can demonstrate vascular invasion and increasingly used to assess respectability and staging of hepatic, biliary and pancreatic neoplasms. [8]

MRA (Magnetic Resonance Angiography) @ is used with excellent results. [9]

Endoscopic Ultrasonography (EUS) @ is a sensitive image of pancreas and duodenum [10,11] and is found superior to CT Scan and Ultrasonography in staging of pancreatic and ampullary cancers [12]. It is found useful in identifying small (<2 cm) pancreatic tumor of patients with distal third bile duct obstruction whose CT Scan is normal. [11]

EUS is a dominant technique for staging of ampullary carcinoma [13], and now direct **FNA** at the time of EUS in patients with suspected pancreatic tumor has become the gold standard method for obtaining a tissue diagnosis.

Assays for **Tumor Markers** @ like (CEA, CA-19-9 and CA-125) are usually elevated in pancreatic cancers, cholangiocarcinoma and periampullary cancers, but they are nonspecific and may be elevated in other benign diseases of the Hepatobiliary tree [14]. In serum and pancreatic fluid the markers are useful particularly for cystic lesions of the pancreas [15].

MRCP is the test of choice for the middle and upper thirds lesions, in which decompression is not required.

If none of all the mentioned modalities points to the diagnosis, use:

¹⁸F-Flouro Deoxy Glucose – Positron Emission Tomography-(FDG PET Scan)

@ It may be considered to help differentiate benign pancreatic conditions from malignant ones. [16,17]

It facilitates diagnosis and provides information regarding occult metastasis and can be useful in detecting recurrent diseases.

When a biliary stricture is detected at **Direct cholangiography(PTC*** &

ERCP), (Brush cytology or Biopsy)* is mandatory, especially with multiple sampling to get accuracy improvement, especially in biliary rather than pancreatic malignancy as biopsy tends to be more accurate.^[18]

The management of MOJ The majority of patient's treatment is palliative rather than curative.

Non operative management includes: drainage and cholangiography by (ERCP or PTC).

PTC is preferable for obstruction near the hepatic bifurcation. Its principles are:

- A. Absence of pre-existing or concomitant hepatic dysfunction and drainage of 1/2 of liver is generally sufficient for resolution of jaundice.^[19]
- B. PTC doesn't permit equal drainage of all liver segments, so some patients may experience persistent sepsis from an infected excluded segment even when the prosthesis is patent.^[19,20]
- C. PTC for obstructed biliary tree may induce cholangitis even with appropriate prophylactic antibiotics, so there should be a plan for biliary drainage either at time or soon after.
- D. Jaundice is believed to be associated with multiple systemic adverse effects, e.g. renal failure, sepsis and impaired wound healing, so routine preoperative drainage of an obstructed biliary system doesn't benefit patients who will soon undergo resection.^[21,]

Direct cholangiography should be with:

- a. Diagnostic test: cytology/biopsy.
- b. Drainage of obstructive bile duct via sphincterotomy, nasobiliary tube, catheter or stent.

Palliation in patients with advanced MOJ, because of risk of complications related to the procedure of drainage, best treatment for patients with asymptomatic MOJ and liver metastasis may be supportive care alone^[22], and biliary decompression is

indicated if there is cholangitis or severe pruritis (which interferes with the quality of life).

Stent placed with ERCP is the modality of choice for advanced diseases, though upper third lesions may be managed most easily through the initial placement of an internal/ external catheter at the time of PTC.

Surgical biliary bypass should be reserved for patients who are expected to survive for six months or longer as bypass procedure is associated with more prolonged palliation at the cost of initial morbidity.^[23]

MOJ patients with unresectable lesions who also present with duodenal or jejunal obstruction should be referred to **gastrojejunostomy** at the time of biliary bypass surgery, and when pancreatic malignancy is present, **intraoperative celiac ganglia injection** should be performed for either prophylactic or therapeutic control.^[24]

RESECTION FOR CURE: modern surgical approaches are resulting in lower postoperative morbidity and, possibly improved 5-years survival^[25], however the progress is still unfortunately poor, except for patients with ampullary tumors.

In fact, the surgical procedures are rarely proved curative, even after meticulous preoperative patient selection.

The benefit of staging **laparoscopy** includes more accurate assessment of respectability and prevention of an unnecessary laparotomy. Laparoscopy must detect peritoneal carcinomatosis, liver metastasis, malignant ascites and gross hilar adenopathy.^[26,27]

Combined laparoscopy with the laparoscopic U/S[®], was associated with shorter hospital stay and lower costs.^[27,28]

Regarding upper third obstruction, palliation includes hepatic duct or segment III hepaticojejunostomy, resection for cure-hilar plate taken down, formal hepatectomy or segmentectomy for adequate proximal margin, with frozen section for both margins then anastomosis,

because cholangiocarcinoma has propensivity to spread in submucosal or perinural plane.

Regarding middle third obstruction, palliation includes hepaticojejunostomy done often distal to the hepatic duct bifurcation, resection for cure. Discrete tumors are usually amenable for resection along with lymphatic chain in porta hepatics. Gall bladder cancer may necessitate the resection of segment III concomitantly. Biliary anastomosis by Roux-en-Y loop (mucosa to mucosa).

Regarding lower third obstruction, palliation includes Roux-en-Y choledochojejunostomy which carries high risk of complications and subsequent development of jaundice.^[29] Resection for cure is usually by pancreaticoduodenectomy (Whipple's procedure). For small adenoma of the ampulla, an acceptable alternative is transduodenal ampullary resection.

Method

This analytic retrospective study of patients treated surgically for malignant obstructive jaundice was done at Al-Bashir Teaching Hospital during the period from June 1999 to June 2006.

The collected data include age, gender, clinical presentation, pathological cases, types of investigations, the surgical procedures used and the post-operative morbidity and mortality.

All the patients were examined and prepared properly according to the available facilities which include blood haemoglobin, PCV, blood urea, serum creatinine, blood sugar, urine analysis and liver function tests.

The image studies include abdominal Ultrasonography and computed tomography, (ERCP) and (MRCP).

The surgical procedures performed to these patients ranged from diagnostic laparotomy to palliative bypass procedure.

The improvement in diagnostic facilities; e.g. imaging techniques, was taken in consideration.

Results

The study includes 98 patients who were treated surgically for malignant obstructive jaundice. Of these 98 patients, there were 58 male patients (59.18%) and 40 female patients (40.82%) with a male/female ratio of 1.45:1.

The age of these patients ranged from 27 years to 85 years with a mean age of 62 years.

The clinical presentations and the percentage of each for these patients are summarized in table 1.

The role of each of these investigations regarding the diagnosis of malignant obstructive jaundice is summarized in Table 2.

The pathological causes of MOJ in these 98 operated on patients; according to surgical exploration and histopathological study, were proved to be as shown in Table 3.

The surgical management of these 98 patients ranged from diagnostic laparotomy (inoperable tumor) to bypass surgery.

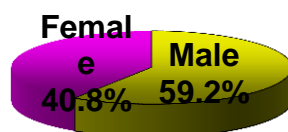


Figure 1. Sex Distribution Pie chart

Table 1. Clinical Presentations and their percentage.

	Clinical Presentation	Percentage %
1	Abdominal Pain	75
2	Anorexia	63
3	Vomiting	58
4	Weight Loss	50
5	Pruritis	41
6	Abdominal Mass	32
7	Metastasis	80

Table 2. The role of investigations in the diagnosis of MOJ.

	Investigation	+ve Patients	-ve Patients	N/A Patient
1	Abdominal ultrasound	30	32	36
2	Abdominal CT scan	38	6	54
3	ERCP	18	16	64
4	MRCP	12	2	84

Table 3. Pathological causes of MOJ and their percentage in the study group.

	Cause	No. of patients	Percentage %
1	Head of pancreas CA	48	48.98
2	Cholangiocarcinoma	21	21.43
3	Adenocarcinoma of gall bladder	12	12.24
4	Ampullary and duodenal CA	17	17.35
	Total	98	100

Table 4. shows the types of surgical procedure done.

	Procedure	No. of patients	Percentage
1	Diagnostic Laparotomy (Inoperable)	10	10.20
2	Whipple's (Curative Resection)	16	16.33
3	Tumor Resection	3	3.06
4	Palliative Bypass	68	69.39
	Endoprosthesis	1	1.02
	Total	98	100%

The postoperative morbidity and mortality were 26.53% (26 patients) and 14.29% (14 patients) respectively.

The causes of postoperative morbidity are summarized in Table 5. While the causes of postoperative mortality are listed in Table 6.

Table 5. Postoperative morbidity

	Cause of morbidity	No. of patients
1	Pulmonary embolism	2
2	Bleeding	3
3	Sepsis	6
4	Anastamotic leakage	7
	Total	18

Table 6. Postoperative Death

	Cause of death	No. of patients
1	Pulmonary embolism	2
2	Bleeding	1
3	Sepsis	4
4	Renal failure	7
	Total	14

Discussion

Unfortunately the majority of patients with **MOJ**, especially those with pancreatic cancer, are clearly unresectable for cure due to either tumor extension (locally advanced) or the presence of hepatic or peritoneal metastasis.^[30]

The majority of these patients are either too old or too ill with co-morbid diseases, therefore for the vast majority of them an endoprosthesis to relief jaundice is the performed.^[31]

It is important to recognize and minimise the iatrogenic risk related to the manipulation of the obstructed biliary system that is why staging by proper assessment is mandatory.

The assessment of a tumor is usually hinges on whether superior mesenteric vein(SMV), portal vein(PV), superior mesenteric artery(SMA) and the porta hepatis are free of tumor, and whether there is evidence of significant local adenopathy or extra-pancreatic extension of the tumor. These can be performed by **EUS & MRCP**.^[12]

Direct cholangiography (ERCP,PTC): If done routinely Preoperatively for decompression is associated with high incidence of postoperative complications when tumor resection is ultimately carried out.^[32,33]

From looking at table 2, the investigations needed for assessment of staging are deficient, there is no EUS (unavailable), while the use of MRCP was limited(14 from 98) and the use of ERCP was diagnostic for(34 from 98) and only one case therapeutic stenting (palliation) out of sixty-nine cases, and others are not done.

The other investigations are either not done or unavailable.

Resection offers the only potential curative approach to pancreatic cancer, otherwise it will be palliative^[34], the aim of which is to relief (jaundice, pain and gastroduodenal obstruction).

The stenting is for those patients with a relatively short survival (3-6months) while relatively fit patients, biliary by-pass provides long term palliation.^[35]

Looking at table 4, the resection was for 19 patients (19.39%), while palliation was for 69 patients(70.41%), and the inoperable patients were 10 (10.20%).

There is only 15-20% of tumors being resectable at presentation^[36], while in our study it is 19.39%.

Up to 1970, more than 15% of patients died either during or shortly after surgery, since then improvement in diagnosis, staging, surgical techniques anaesthesia, and postoperative care have reduced the short-term death to less than 5% in patients whose operation is performed at cancer centers by experienced surgeons. At Tertiary centers the rate is less than 4% , but still be above 15% in patients who are treated at small hospitals or by less experienced surgeons^[37].

The immediate postoperative serious complications affect up to one third of patients^[37], while in our study it is 42.10% for resection procedures and 14.49% for bypass procedures .

In our study the mortality of resection procedures is 26.31%, while for bypass procedures is 13.04%.

Table 7. Type of surgery according to the disease

	Head of pancreas	GB & Biliary Ducts	Ampulla & Duodenum
Inoperable—diagnostic laparotomy	2	3 & 5	-
Tumor resection	-	- & -	3
Endoprosthesis	-	- & 1	-
Whipple	12	- & 4	-
Bypass	34	9 & 11	14
Total = 98	48	12 & 21	17

Table 8. Morbidity according to the type of surgery.

	Whipple	Bypass	Tumor resection
Pulmonary embolism	1	1	-
Bleeding	1	1	1
Sepsis	2	4	-
Anastomotic leakage	2	4	1
Total = 18	6	10	2

Table 9. Mortality according to the type of surgery.

	Whipple	Bypass	Tumor resection
Pulmonary embolism	1	1	-
Bleeding	1	1	1
Sepsis	2	4	-
Anastomotic leakage	-	3	-
Total = 18	4	9	1

In our study the mortality of resection procedures is 26.31%, while for bypass procedures is 13.04%. The immediate postoperative serious complications affect up to one third of patients^[37], while in our study it is 42.10% for resection procedures and 14.49% for bypass procedures.

Early morbidity and 30-day mortality are significantly higher with surgical procedures than endoscopic/per-cutaneous drainage, and independent of type of stricture, successful endoprosthesis placement can be achieved in 84-96% of these patients. In our study, it is too limited usage of the interventional endoprosthesis, which could be due to unavailability of resources and expertise for endoscopic or percutaneous treatment.

This may suggest the followings:

1-The need for the availability of more sophisticated tests and advanced diagnostic techniques with competent operators to

have an early and optimal diagnosis to facilitate the task of management that hopefully will improve the outcome.

2-Establishment of dedicated centers for optimizing treatment of pancreatic and biliary cancers.

3-Need for training in endoscopic procedures for surgeons.

Conclusion

The most useful management with good successful rate depends mainly on the availability and proper use of the resources (investigative facilities which aid in a good preoperative diagnosis & staging of the disease) and personnel, that provide a suitable selection of the management approach.

Most of the patients who underwent palliative bypass surgery were operated on in the first years of this study. The number of patients to undergo such surgical

approach declined in the later years of the study due to the "improvements" in the preoperative diagnostic modalities.

Our study showed that there was gradual development in the staging of MOJ resulting in some improvement in the surgical management, keeping hand by hand with the international standards and taking in account the special community circumstances.

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