Case study

THERAPEUTIC FOR THE MANAGEMENT OF PANCREATIC HEAD ADENOCARCINOMA ABOUT 40 CASES

ABSTRACT

Pancreatic cancer accounts for the majority of malignant pancreatic lesions. Its incidence is increasing and its prognosis is poor.

Most patients are asymptomatic during the early course of disease, which often leads to delay in diagnosis.
Treatment options include surgery, chemotherapy, and palliative care.

The objective of this work is to describe and analyze the epidemiological and clinical profile and the therapeutic management of adenocarcinomas of the head of the pancreas as well as to report the experience of the digestive oncology and liver transplant department of the CHU IBN ROCHD, through a retrospective study spread over a period of 02 years, from January 2020 to December 2022.

This work is important for scientific community because pancreatic cancers had remained without symptoms for a long time, and they are diagnosed at an advanced stage.

KEYWORDS

Pancreas , adenocarcinoma, therapeutic

1. INTRODUCTION

Pancreatic adenocarcinoma accounts for 90% of pancreatic tumors and would be the second leading cause of cancer death in Europe in 2030 (1).

Today, it represents a major challenge in digestive oncology. Its prognosis is very poor.

Treatment may include surgery, chemotherapy or a combination of these.

The aim of our study is to describe and analyze the therapeutic management of pancreatic head adenocarcinoma.

2. METHODS :

2.1 Type of study

This is a retrospective study of 40 cases of a pancreatic head adenocarcinoma. The study was conducted in the visceral surgery department of the Ibn Rochd University Hospital in Casablanca over a 2-years period from January 2020 to December 2022.

2.2 Study population

a. Inclusion criteria

- Pancreatic head adenocarcinoma
- Treatment in the visceral surgery department of the Ibn Rochd University Hospital in Casablanca
- Complet and usable records

b. Exclusion criteria

They are excluded:

- Tumors other than pancreatic adenocarcinoma
- Body and tail pancreatic cancer
- Incomplete files that cannot be used.

2.3 Data collection

- Data from the medical records of hospitalizations in the visceral department at the Ibn Rochd University Hospital in Casablanca were collected according to an operating form (see Appendix 1). This allowed the collection of various epidemiological, clinical, para-clinical, therapeutic and evolutionary data; in order to compare our results with those of the literature.

- In order to compare our results with those of the literature, we proceeded to a bibliographical research by means of EMC, Science direct, Pub Med, and the analysis of theses and the study of the works of visceralists available.

2.4 Statistical analysis

Excel software was used. Descriptive statistics are provided by cross-tabulations with medians (interquartile ranges [IQR]) for continuous variables and frequencies (percentages) for categorical variables.

3. RESULTS :

3.1 Epidemiological data

a. Socio-demographic data

➢ Gender :

Of the 50 patients involved, 19 were male (47.5%) and 21 were female (52.5%).

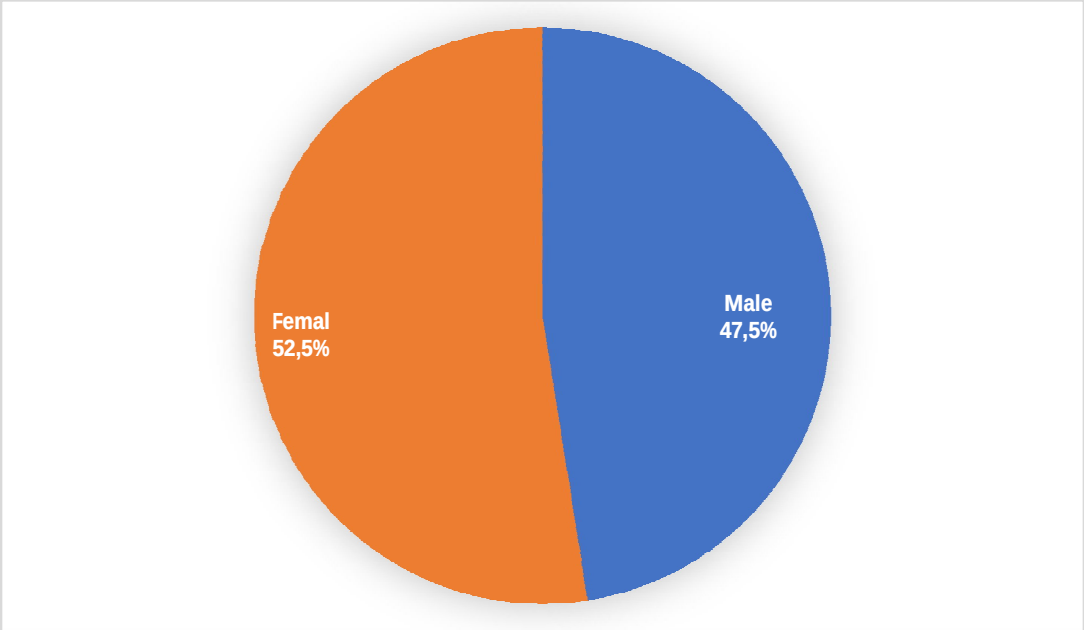

Figure1 : Distribution of patients by gender

- Age

The average age of the patients was 65 years old with extremes of: 46 to 92 years old

Ages	Number	%
40-50	3	7,5%
50-60	12	30%
60-70	10	25%
70-80	11	27,5%
80-90	4	10%

Table 1: Distribution of patients according to age

3.2 **Clinical data**

a. Time to consultation :

The consultation time for our patients was superior than 40 days in 60 % of cases

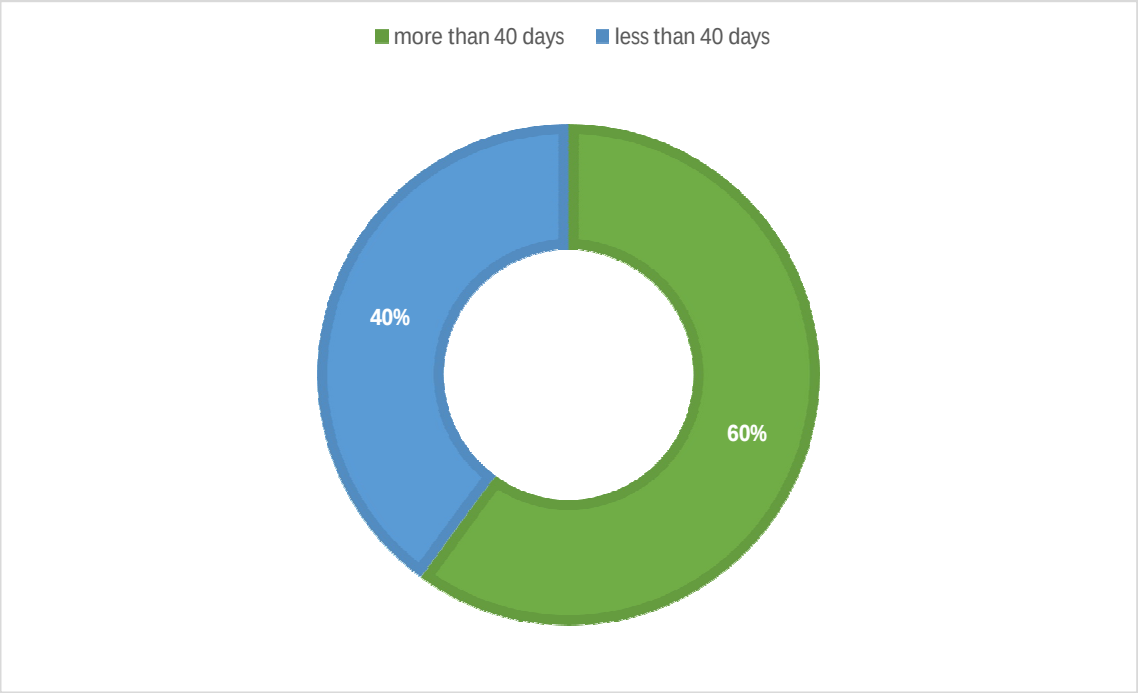

Figure 2: The consultation time

- Reason for consultation :

The reasons for consultation are icterus (52.5% of cases), and epigastric pain (47.5% of cases)

- Symptoms

Deterioration of general condition (100%) - Dark urine in 36 patients (90%)- Light-colored stools in 36 patients (90%)- Icterius in 35 patients (87,5%)- Pruritus in 32 patients (80%)- Abdominal pain in 28 patients (70%) - Nausea - vomiting in 12 patients (30%)

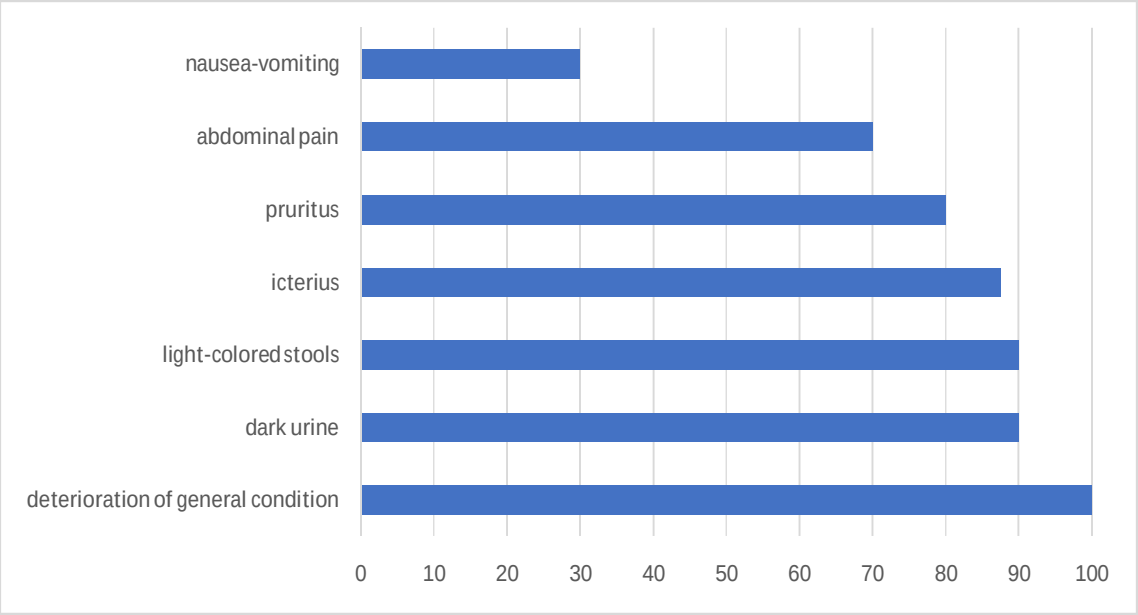

Figure 3: symptoms disease

- Clinical examination

The clinical signs were: Abdominal tenderness in 15 patients (37.5%) - Palpable gallbladder in 18 patients (45%) -Ascite in 2 patients (5%) - Hepatomegaly in 1 patient (2.5%)

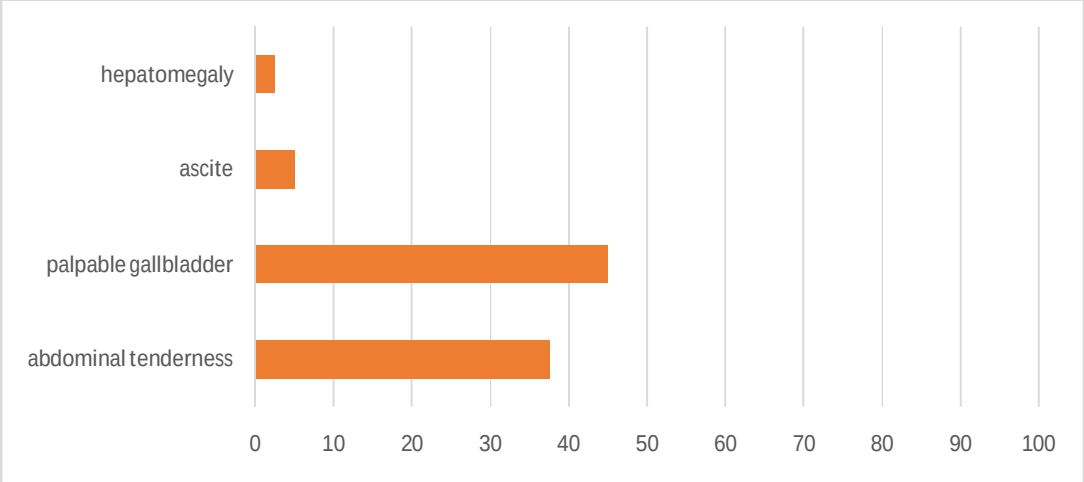

Figure 4: clinical examination

3.3 Paraclinic data

- Biological results

Biological cholestasis syndrome in 37 patients (92,5 %), hepatic cytolysis was found in 37 patients (92.5%), prothrombin time less than 70% was found in 10 patients (25%), anemia was present in 22 patients (55%), renal failure was found in 2 patient (5%), hypoalbuminemia was found in 18 patiens (45%)

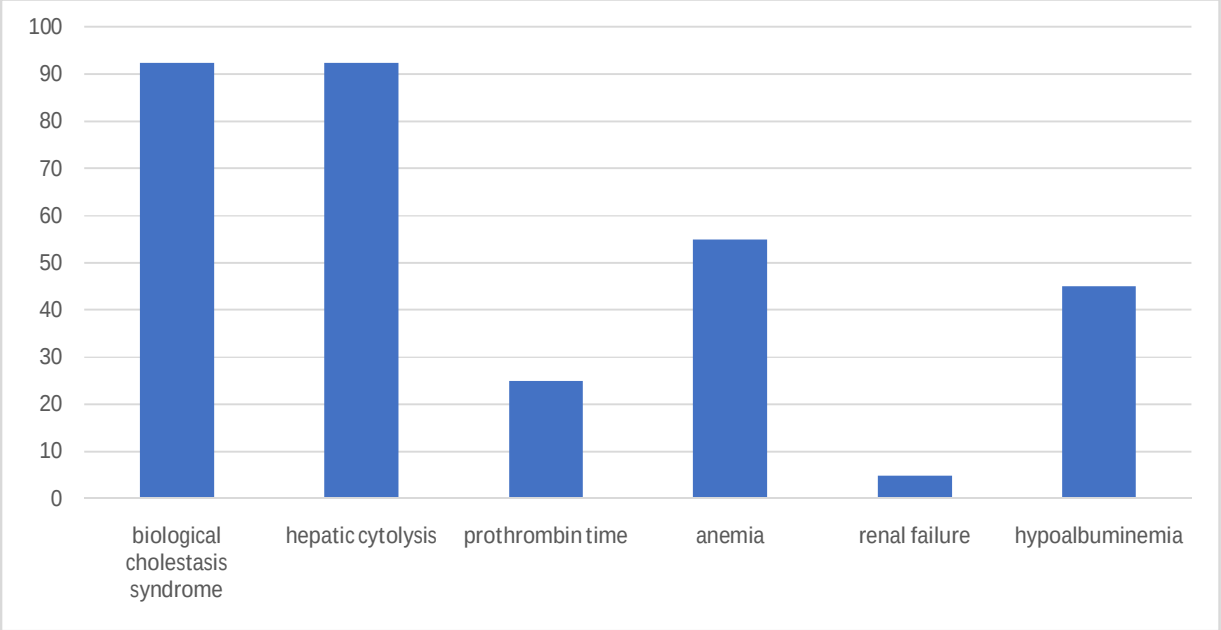

Figure 5: biological results

- Radiological assessment

i. Abdominal ultra sound

It was performed in 40% of our patients.

-It was normal in 18.75% of cases

-She had revealed:

Pancreatic head tumor in 43.75% of cases, the dilation of the bile ducts in 81.25% of cases, liver metastases in 6% of cases

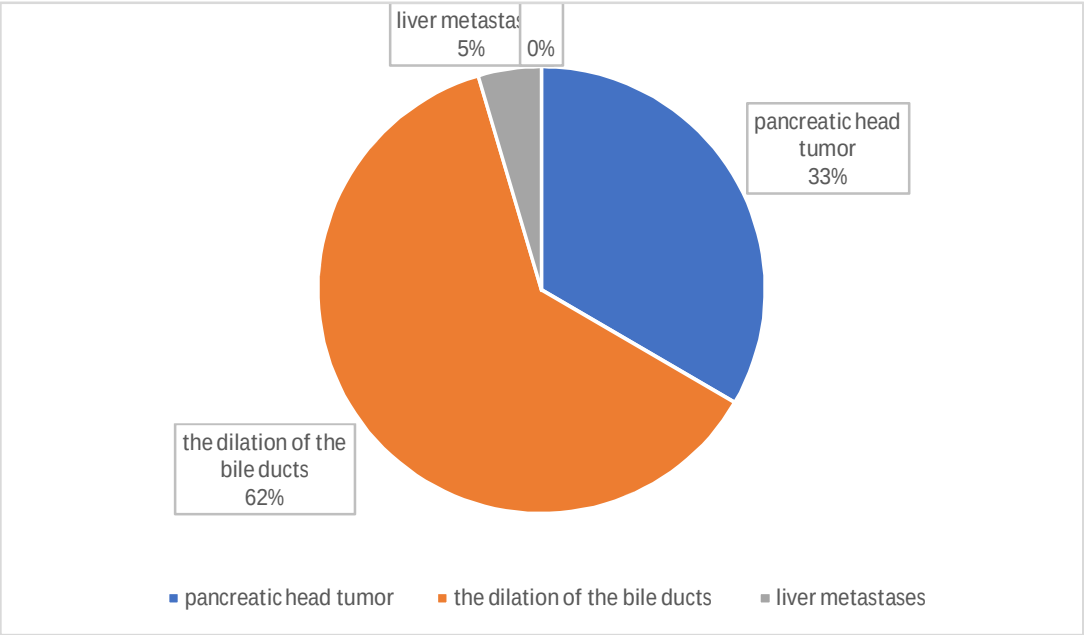

Figure 6: abdominal ultra sound results

ii. Abdominal CT scan

it was performed in 92.5% of patients

-It had revealed the tumor in 97.29% of cases

-The site of the tumor was:

The head in 70% of cases- The incus in 17.5% of cases- The head and incus in 7.5% of cases- Head and body in 5% of cases

-The mean tumor size was 37mm, with extremes ranging from 10.8mm to 77mm.

- A dilation of the common bile duct was demonstrated in 90% of patients.

-Dilation of the Wirsung duct was found in 90% of patients

Site of the tumor	Pourcentage %
The head	70
The incus	94
The head and incus	48
The head and body	36

Table 2: Site of the tumor

- Extension assessment

i. CT TAP

-It was performed in 77.5% of patients

-It revealed vascular extension in 60% of patients:

The superior mesenteric vessels were invaded in 47.5% of cases-The superior mesenteric artery alone in 15% of cases- The superior mesenteric vein alone in 12.5% of cases- The superior mesenteric artery and vein in 20% of cases- The portal vein was invaded in 5% of cases- The inferior vena cava in 12.5% of cases- The renal vessels in 5% of cases- The splenomesaraic venous trunk in 7.5% of cases- The abdominal aorta in 7.5% of cases- The hepatic artery in 2.5% of cases- The celiac trunk in 0% of cases

Site of vascular extension	Pourcentage %
The superior mesenteric vessels	47.5
The superior mesenteric artery	15
The superior mesenteric vein	12.5
The superior mesenteric artery and vein	20
The portal vein	5

The inferior vena cava	12.5
The renal vessels	5
The splenomesaraic venous trunk	7.5
The abdominal aorta	7.5
The hepatic artery	2.5
The celiac trunk	0

Table 3: Vascular extension

-The TAP CT had shown a loco-regional extension in 50% of the patients. The organs invaded were:

Lymph node in 22.5% of cases-Peripancreatic fat in 15% of cases-The duodenum in 12.5% of cases-The liver in 5% of cases-Peritoneal carcinomatosis in 5% of cases-The stomach in 2.5% of cases

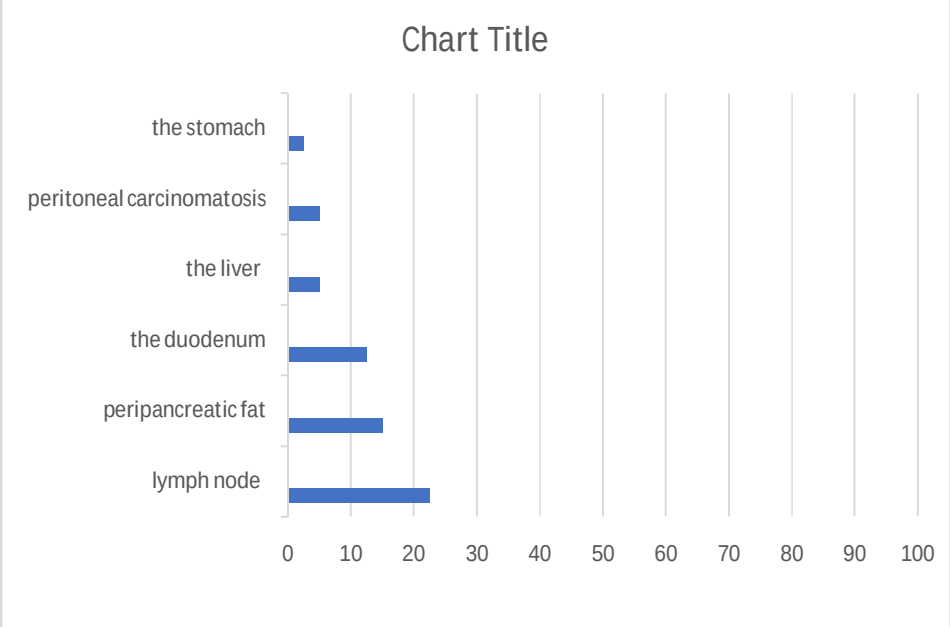

Figure 7: loco-regional extension

- Distant metastases were found in 8 patients

The lung in 17.5% of cases-Bone in 2.5% of cases

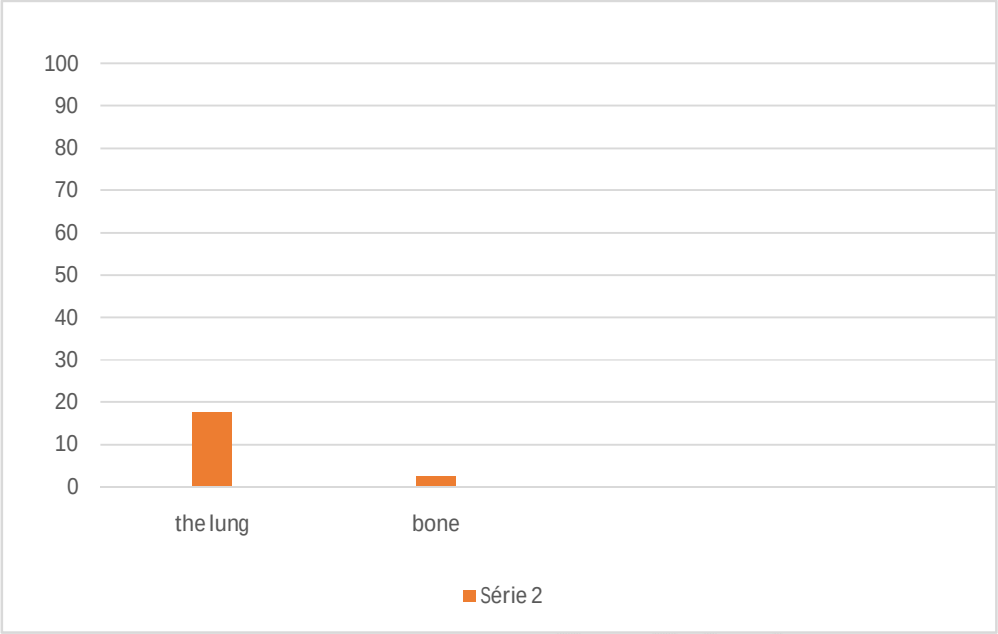

Figure 8 : Distant metastases

ii. Hepatic MRI :

-It was performed in 30% of patients

-No hepatic metastases were revealed

iii. Echo-endoscopy :

-It was performed in 2 patients (5%)

-it had dertermined the macroscopic tumor characteristics :

Mean tumor size was 35mm – Localization in the uncus was found in 1 patient and in the head in 1 patient

-It had revealed a loco-regional extension :

In the superior mesenteric vessels in 2 patients – In the spleno-mesaraic trunk in 1 patient – In the lymph node in 2 patients

-It had allowed the realization of a cystopunction in 2 patients which was positif

iii. FDG positron emission tomography (PET scan):

None of the patients in our series had benefited from this assessment

iv. Exploratory laparoscopy:

It was performed in 2 of our patients (5%)

v. Radiological staging:

-Each tumor was classified according to the TNM AJCC 2017 classification (8th version):

-The tumor stages are summarized in figure 9

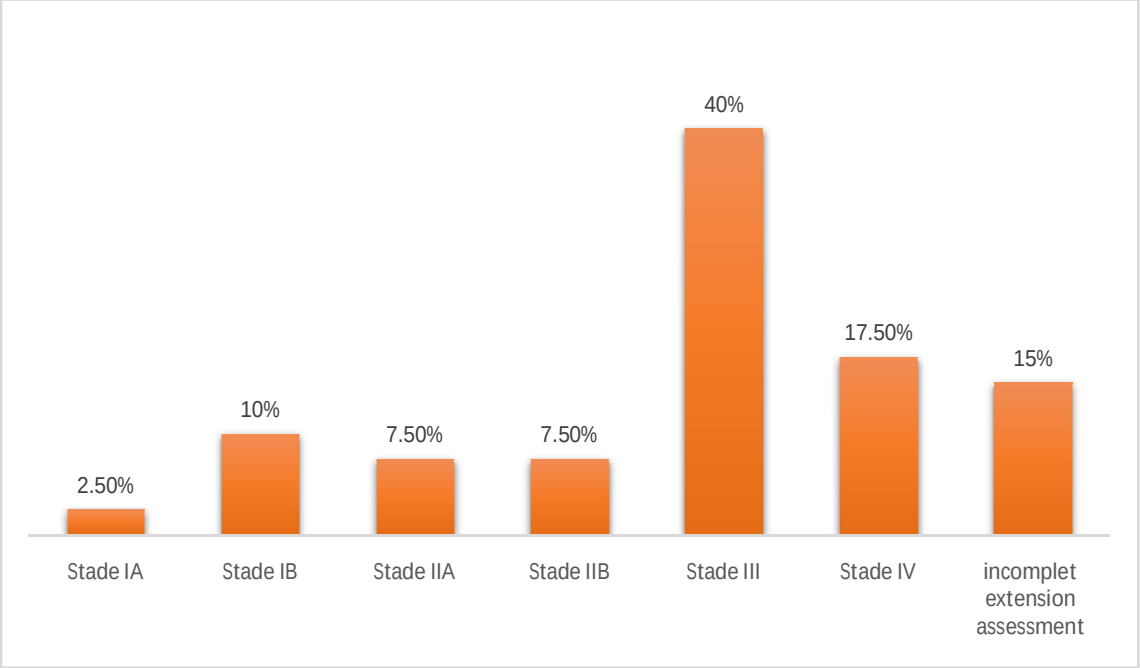

Figure 9 : Distribution of the different tumor stages

3.4 Treatment

a. Multidisciplinary Consultation Meetings

The files of all the patients were discussed in Multidisciplinary Consultation Meetings before their treatment

b. Preparing the patient for surgery:

It included:

- Smoking cessation in all patients

-A correction of hypoalbuminemia and hydro-electrolyte disorders

-A preventive Low Molecular Weight Heparin (LMWH)in all patients during hospitalization

c. Surgery:

- Type of surgery:

-pancreaticoduodenectomy was performed in 6 patients (15%)

-a palliative bypass was performed in 32 patients (80%)

-a laparoscopic biopsy was performed in 2 patients (5%)

- Approach:

-The right subcostal approach was performed in 95% of patients

-Laparoscopy was performed in 5% of patients

- Surgical exploration:

In the table, the tumor characteristics was found during surgery

Tumor characteristics	During surgery	%
Mean tumor size	53,78mm	
Localization	Head Uncinate process	75% 25%
Vascular relationship	Vascular extension	57,5%
metastasis	Lymph node extension Liver Peritoneal carcinomatosis	7,5% 17,5% 7,5%

Table 4: Tumor characteristics during surgery

- Tumor resectability:

Pancreatic cancers were divided into three groups:

- Unresectable: 26 patients had unresectable tumors based on imaging (65%) versus 28 patients were indentified on peroperative (70%)

-Borderline:

This group included 2 patients (5%)

The cause was invasion of the superior mesenteric vein on less than 180° of circumference with the possibility of vascular reconstruction.

-Resectable:

12 patients had resectable tumors according to the imaging assessment (30%) versus 10 on peroperative (25%)

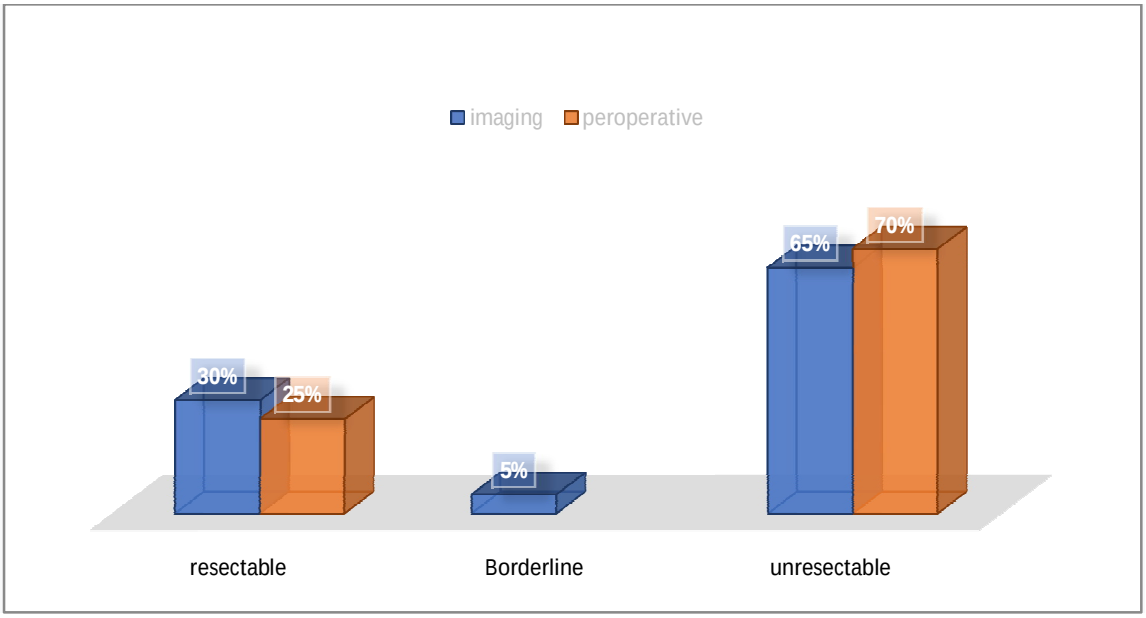

Figure 10: Tumor resectability rate on imaging assessment and peroperative

➢ Post-operative evolution

-Short-term and medium-term complications were reported in 5 patients (12.5%):

Anastomotic release (5%) - Pancreatic fistula (2.5%)- An Acute pulmonary edema (2.5%) - Neurological distress (2.5%)

- Mortality during hospitalization was 5%

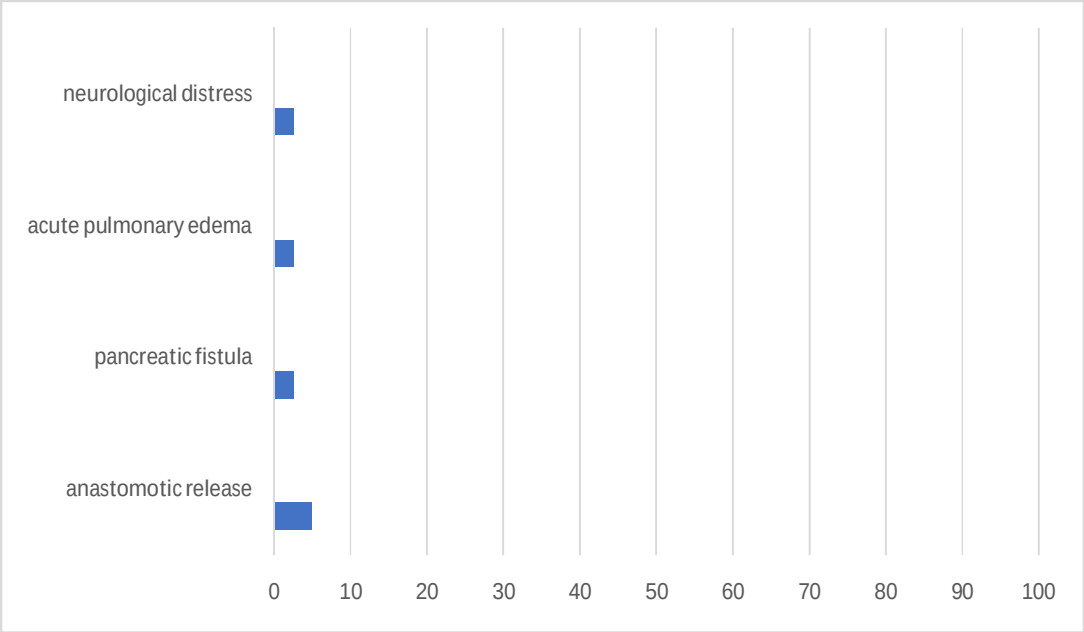

Figure 11: Post-operative evolution

4. DISCUSSION :

4.1 Epidemiological data

a. Risk factors for pancreatic cancer

The risk factors can be grouped as non-modifiable and modifiable risk factors (2,3)

- Non-modifiable factors

i. Age

Pancreatic cancer is predominately a disease of older individuals. Pancreatic cancer is rare in the 1st three decades of life. After age 30, however, incidence rates increase exponentially and peaks in the 7th and 8th decades (4,5). In the US, majority of the patients with pancreatic cancer are diagnosed between the ages of 40 and 80 years with the median age at diagnosis of pancreatic cancer being 71 years (6).
In our series, the mean age of our patients was 65 years.

ii. Gender

Pancreatic cancer is 30% more common in men than women. The overall age adjusted incidence rate for pancreatic cancer is 13.9/ 100,000 for men and 10.9/100,000 for women.

The incidence rates differ sharply among men and women between highly developed and less developed countries. Incidence rates of 8.5/1,00,000 for men and 5.6/1,00,000 for women are observed in developed countries, while incidence rate of 3.3/1,00,000 in men vs. 2.4/1,00,000 in women are reported in less developed or developing countries (6).

In India, males are 1.5–2 times more affected than females (7).
Several studies have evaluated gender-specific hormonal risk factors for a causal role in susceptibility to the pancreatic cancer (8,9). A recent systematic review (8)has concluded that reproductive factors are not associated with the development of pancreatic cancer in women. This suggests that the differences in pancreatic cancer rates between men and women may be due to environmental factors like smoking, although it is possible that there may yet be undiscovered genetic factors influencing cancer incidence and mortality in males and females.
In our series, we note a female predominance with a sex ratio F/M 1.1.

iii. Ethnicity

Race is a recognized risk factor for pancreatic cancer. Significant differences in the incidence of pancreatic cancer have been reported between races. In the United States, African-Americans have a higher incidence than Caucasians while the incidence is lowest in Asian Americans and Pacific Islanders (6). African- Americans are also more likely to be diagnosed with advanced disease and less likely to receive surgery for pancreatic cancer (10). The higher incidence in African-Americans has been attributed to differences in modifiable risk factors such as diet, alcohol, smoking, and vitamin D insufficiency. However, recent population based studies have shown that the increased incidence of pancreatic cancer is not completely explained by the known and suspected risk factors listed above, suggesting other factors that may contribute to the increased risk (11). These factors may include racespecific genetic differences which result in an increased risk of acquired mutations from known toxins e.g. in the ability to detoxify tobacco products (12,13).

iv. Blood group

Large epidemiological studies have found an association between ABO blood groups and the risk of developing pancreatic cancer.
People with blood groups A, AB, or B have a higher risk of developing pancreatic cancer than people with blood group O (6).

vi. Genetic risk factors

Pancreatic cancer, like all other cancers, is a fundamentally genetic disease caused by both inherited and acquired genetic mutations.
Genetic variation/mutations plays an important role in both the familial and non-familial (sporadic) occurrences of pancreatic cancer.
More than 80% of pancreatic cancer develops due to sporadically occurring mutations. A small proportion of pancreatic cancer cases are due to inherited germline mutations (6).

vii. Chronic pancreatitis

Chronic pancreatitis is a progressive inflammatory disease of the pancreas with acinar cell destruction and significant pathologic fibrosis.
The major etiologies of chronic pancreatitis include alcohol abuse, heredity, and idiopathy, which have strong genetic predisposition.
Chronic pancreatitis is considered a risk factor for pancreatic cancer (6).

viii. Diabetes mellitus

The association between diabetes and pancreatic cancer has long been recognized. Almost 175 years ago, a patient who presented with DM and died six months later from pancreatic cancer was reported (14). Since this initial observation, numerous epidemiological studies have reported that DM occurs more frequently in patients with pancreatic cancer than in the general population (15–17).

- Modifiable factors

i. Obesity

Obesity (defined as BMI >/=30) and increased BMI are both are risk factors for pancreatic cancer. A recent meta-analysis evaluated the association between obesity and pancreatic cancer in men and women, and reported similarly increased pooled risk ratio in both obese men and women compared to those of normal weight [Men: RR 1.36; 95% confidence interval (CI) 1.07 to 1.73, Women: RR 1.34; 95% CI 1.22 to 1.46] (18).

ii. Dietary factors

There is an increased risk of pancreatic cancer associated with high consumption of meat (especially grilled), cholesterol, fried foods and other foods containing nitrosamines (19).

iii. Alcohol

Alcohol has long been suspected as a risk factor for pancreatic cancer because of its role in the etiology of chronic pancreatitis (CP).

There are a variety of effects of alcohol on pancreatic functions – on exocrine output and on hormones (20).
It is generally accepted that ethanol metabolism alters the intracellular redox state, which might play a central role in the mechanism underlying alcohol induced CP and pancreatic cancer (21–23).

iv. Infection

Two studies reported a link between hepatitis B virus and hepatitis C virus infection, and pancreatic cancer, with the relationship being stronger for hepatitis B virus infection (24,25).

- Incidence :

Interestingly, it is more common in African-Americans, slightly more common in men, and is usually a disease of older adults (26). Despite its relative low incidence compared to other more common malignancies (prostate, lung, colorectal, etc), pancreatic cancer represents the fourth leading cause of death in men and women.

4.2 Positive diagnosis

a. Common presentation

Unfortunately, most patients do not note symptoms during the early course of their disease, which often delays diagnosis. Jaundice is one of the main presenting symptoms, especially with pancreatic head tumors. Some patients present with pancreatic exocrine insufficiency, which can manifest as a wide spectrum of symptoms, including steatorrhea (fatty, frothy, loose, greasy, foulsmelling stools), malabsorption, weight loss, abdominal discomfort, and abdominal bloating. Yet others can present with dull, nonspecific pain, which usually occurs as a result of tumor invasion of celiac or superior mesenteric arterial plexus. Other common clinical manifestations of pancreatic cancer include nausea, anorexia, weight loss, and new-onset diabetes mellitus.

b. Biology

Routine lab tests are usually non-specific, though elevated liver tests may suggest biliary obstruction.

Cancer-associated antigen 19-9 (CA 19) is the most well-known and likely the most useful. It serves as an adjunct in diagnosis, and in monitoring response to

treatment(26,27) . However, it should be noted that false-positive results (high values of CA 19-9 in the absence of malignancy) can be seen with cholestasis related to non-malignant obstruction (ie choledocholithiasis, cholangitis, and chronic pancreatitis(27) .

c. Radiologic Imaging

Though many patients presenting with jaundice often undergo trans-abdominal ultrasound as part of the initial evaluation for jaundice, MRI of the pancreas (with MRCP) or CT of the pancreas (pancreatic protocol CT) are the preferred radiologic modalities to identify and help stage pancreatic cancer, with MRI being preferred to CT.

d. Endoscopic Imaging

Endoscopic ultrasound (EUS) is felt to be the most accurate test for the diagnosis of pancreatic cancer. It has been shown to have a higher sensitivity and specificity for detecting pancreatic masses than CT, although there have been no prospective head-to-head studies comparing the two modalities (28). The ability to add fine needle aspiration (FNA) cytology to EUS increases the specificity of detecting pancreatic cancer, compared to imaging studies (29).

4.3 Treatment Options

a. Surgery

Surgery is the only treatment modality for pancreatic cancer that is potentially curative(30). Unfortunately, only 15–20% of patients are candidates for pancreatectomy, due to the high proportion of advanced disease at presentation. An absolute contraindication to surgery is extra-pancreatic disease. Vascular involvement is a relative contraindication – in some cases, vascular resection and reconstruction are performed with good success.

The most common surgical procedure for pancreatic cancer localized to the head or uncinate region or both is pancreaticoduodenectomy, commonly referred to as the Whipple procedure. This involves en bloc removal of the head of the pancreas and duodenum, distal common bile duct, and proximal jejunum. A pancreaticojejunal anastomosis is also established. The mortality

rate with the Whipple procedure has improved significantly and is now less than 3% when performed at a center of excellence for pancreatic surgery (31).

Predictors of better outcomes after surgery include tumor size < 3 cm, lack of lymph node metastases, negative resection margins, well-differentiated tumors, and intra-operative blood loss of < 750 mL (32).

Still, prognosis for pancreatic cancer remains poor, even after potentially curative surgery. The five-year survival rate after resection remains approximately 25%, similar to that of 30 years ago (26).

The most common symptoms that require palliation are jaundice, gastric outlet obstruction and pain. Obstructive jaundice should be trated with a biliary bypass, the optimal palliation in relatively fit patients and endoscopic stenting is preferred in patients with short survival (3–6 months). To prevent gastric outlet obstruction a prophylactic gastroenterostomy should be performed routinely during bypass surgery (33).

5. CONCLUSION

Until now, despite therapeutic progress, the prognosis of pancreatic adenocarcinoma remains poor. Survival is very low as it is often diagnosed at advanced stages. This study deals with the different risk factors, the diagnosis, and the treatment of this cancer.

Consent

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

Ethical Approval

Data collection was carried out while respecting the anonymity of the patients and the confidentiality of their information.

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