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Case Report

Pancreatic adenocarcinoma presenting as biliary sepsis in a young female: a case report highlighting diagnostic challenges and management strategies

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ABSTRACT

Pancreatic malignancy is typically associated with advanced age, with the highest incidence occurring globally in the 6th to 7th decade of life and a higher prevalence in men than women. We present a case of pancreatic adenocarcinoma in a 19-year-old female who presented with obstructive jaundice complicated by biliary sepsis, septic shock, and severe acute respiratory distress syndrome (ARDS). Management involved initiating broad-spectrum antibiotics and performing percutaneous transhepatic biliary drainage (PTBD) for source control. With gradual improvement, she was weaned off vasopressor and ventilator support and subsequently extubated. Magnetic resonance cholangiopancreatography (MRCP) revealed an ulcer proliferative growth, prompting endoscopic retrograde cholangiopancreatography (ERCP) with biopsy, which confirmed moderately differentiated adenocarcinoma of the pancreas. Pancreatic cancer, particularly ductal carcinomas, are rare in younger individuals, often leading to underappreciation of their clinical features and treatment among physicians. This case emphasizes the importance of considering malignancy in young patients presenting with pancreatic biliary sepsis. High suspicion warrants MRCP, and if malignancy is suspected, ERCP with histopathology should be performed for early diagnosis and intervention to impede disease progression.

Keywords: Pancreatic cancer, Obstructive jaundice, Epidemiological screening in young age, ARDS, PTBD, MRCP, ERCP

INTRODUCTION

Biliary tract infections can manifest as sepsis across all age groups, with a higher prevalence observed in the elderly. The primary causes of biliary sepsis encompass cholelithiasis, cholecystitis, cholangitis, and, albeit rarely, malignancy. The progression of pancreatic cancer often results in biliary tract obstruction, leading to severe complications such as sepsis.[1,2] Pancreatic malignancies are more frequently encountered in developed regions, displaying a predilection for males over females, and typically occur in individuals between their 6th and 7th decades of life. Diagnosis before the age of 55 poses significant challenges.[3-5]

Similarly, data derived from Population-Based Cancer Registries (PBCRs) in India indicate a higher incidence among males compared to females, with a ratio of 1.2:1. The northeastern region of India reports a notable prevalence of pancreatic cancers.[6]

Here, we present a case of pancreatic adenocarcinoma in a young female from central India, presenting with biliary sepsis complicated by ARDS.

CASE REPORT

A 19-year-old female presented with a 3-month history of yellowish discoloration of the skin, decreased appetite, low-grade fever, and generalized pruritus for the past 10 days. Abdominal ultrasound revealed gallstones with common bile duct dilation, prompting referral to AIIMS Bhopal. On admission, she exhibited tachycardia, tachypnea, hypotension, and severe hypoxemia with a P/F ratio of <100. A diagnosis of biliary sepsis with septic shock and severe ARDS was made, and she was promptly initiated on invasive mechanical ventilation following the ARDS NET protocol, alongside prone positioning. Vasopressors were administered via a central venous line to address shock, along with broad-spectrum antibiotics and percutaneous transhepatic biliary drainage (PTBD) to alleviate biliary obstruction. Over the subsequent two days, her hemodynamic status improved, and she was gradually weaned off vasopressors and mechanical ventilation, ultimately being extubated on the 5th day of ICU admission. Serial investigation findings are presented in Table 1. Persistent hyperbilirubinemia prompted a contrast-enhanced computed tomography (CECT) scan of the abdomen, revealing acute-on-chronic pancreatitis, warranting further evaluation with magnetic resonance cholangiopancreatography (MRCP) to exclude neoplastic etiology. MRCP identified an ill-defined ulcer proliferative lesion involving the pancreatic head and periampullary region (Figure 1). Subsequent endoscopic retrograde cholangiopancreatography (ERCP) with biopsy confirmed moderately differentiated adenocarcinoma of the pancreas (Figure 2).

Treatment and follow-up

The patient presented with severe acute respiratory distress syndrome (ARDS) accompanied by septic shock. Management was initiated following the ARDS protocol, including two prone ventilation sessions. Empirical broad-spectrum antibiotic therapy was administered for suspected biliary sepsis, providing double gram-negative and single gram-positive coverage. Vasopressor support was maintained with norepinephrine and vasopressin, along with other supportive measures.

Table 1: Serial chart of investigation.

Date	Day 1	Day 2	Day 4	Day 7	Day 10	Day 21	Day 51	Day 81
HB	10.3	8.2	7.8	7.7	10.3	8.9		
WBC	37.13	36.65	25.74	24.87	23.06	8.42		
Platelet	226	159	201	273	585	639		
PT/INR	14.3/1.26	16.6/1.46						
aPTT	99.3	34.7						
Urea	48.77	45.83	51.5	32.8				
CREAT	0.91	0.97	0.71	0.52				
Amylase	37.42							19.88
Lipase	7.2							9.6
TB	32.29	21.29	12.07	9.79	11.84	8.92	2.21	1.72
DB	16.9	11.64	6.7	5.19	6.14	4.68	0.99	1.01
AST	251.6	180.1	118	376	145	108	101.6	151
ALT	85.3	61.47	66	145	212	97.5	52.2	86.8
ALP	347.85	297.7	265	231	340	215	507.4	918.9
T. protein	4.4	3.76	4.7	494	6.7	6047	6.88	6.4
ALB	2.43	1.96	2.45	2.56	3.18	3.58	3.64	2.87
Ca^{2+}			8.03					
PO^{4-}			2.04					
Mg^{2+}			1.88					
LDH			1047.09					
PCT								
CRP	189.26							
D-Dimer		0.68						
FIBRINOGEN		417.1						
Hep A, B, C, D, E, HIV	Negative							
Ferritin			367.1					
HBA1C			5.3					

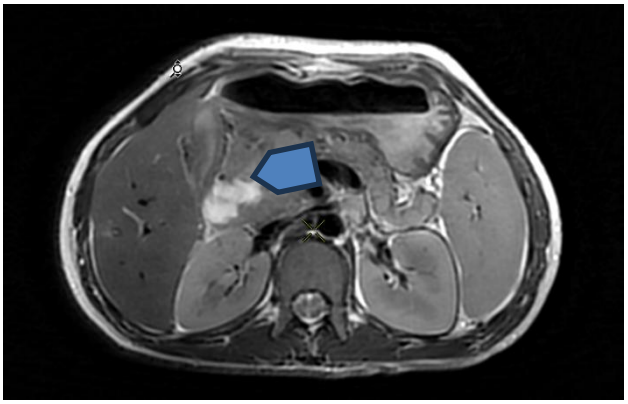

Figure 1: Ill-defined T2 iso to hyperintense ulcero-proliferative soft tissue seen involving the head of pancreas and periampullary region (blue arrow). PTBD catheter noted insitu in right posterior sectoral duct (white arrow). Pancreatic body and tail appear atrophic with dilated main pancreatic duct (black arrow).

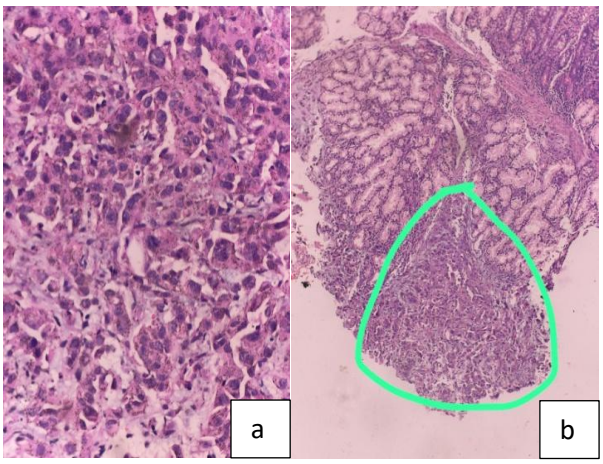

Figure 2 (a and b): Block and slide for review (Biopsy taken from periampullary ulcer): consistent with moderately differentiated adenocarcinoma

After successful weaning from both mechanical ventilation and vasopressor support and histopathological confirmation of pancreatic malignancy, the patient surgical oncology reference was done. A staging workup was planned, to be followed by surgery or chemotherapy in accordance with standard treatment guidelines.

DISCUSSION

Pancreatic cancer predominantly affects males in their 5th to 6th decades, contrasting with our patient, a 19-year-old female, in our report underscores the imperative of vigilant awareness of, early-onset pancreatic cancer (EOPC), typically defined as diagnosis before age 50 years, remains rare yet appears to be increasing in relative proportion underscoring the importance of screening and recognizing risk factors.[7] These encompass both modifiable (e.g., smoking, alcohol consumption, obesity, dietary factors, and exposure to toxins) and non-modifiable factors (e.g., gender, age, ethnicity, diabetes mellitus, family history of pancreatic cancer, genetic predisposition, chronic infections, non-O blood group, and chronic pancreatitis), emphasizing the significance of early detection to impede disease progression. The interplay of these factors emphasizes that early detection remains of paramount importance, since earlier stage diagnosis may permit more effective intervention and improve outcomes. Recent reviews affirm that EOPC may have distinct risk-factor profiles compared to later-onset disease.[8,9]

In our case, the diagnostic journey was challenging: the patient presented with biliary sepsis presumed secondary to gallstone disease. Given the atypical age and absence of classical risk behavior's (e.g. Smoking, alcohol use), suspicion for pancreatitis was entertained. A contrast-enhanced computed tomography (CECT) scan was undertaken, followed by magnetic resonance cholangiopancreatography (MRCP) which flagged a suspicious pancreatic lesion, and subsequent endoscopic retrograde cholangiopancreatography (ERCP) with biopsy confirmed malignancy.

Studies by Abboud Y et al and Yifan Li highlight the increased incidence of pancreatic cancer in younger women (<55 years) and the involvement of germline variants in early-onset cases, respectively. Recent research by Ogobuiro L et al further delineates the distinct molecular landscape of young-onset pancreatic cancer, holding both prognostic and therapeutic implications.[10-12] Our patient, a young, nonalcoholic, nonsmoking female, underscores the multifactorial etiology of pancreatic malignancy, implicating dietary habits and genetic factors.

CONCLUSION

The absence of suspicion for malignancy in our young female patient initially underscores the diagnostic challenges associated with pancreatic biliary sepsis which led to a delay in diagnosis of malignancy. This reinforces the importance of comprehensive diagnostic evaluation, including MRCP, in suspected biliobiliary–pancreatic pathology and, where indicated ERCP with histopathology to arrest disease progression and potentially alter disease trajectory.

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