



DIAGNOSIS APPROACH FOR HEAD OF PANCREATIC CARCINOMA WITH HEPATITIS B

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Abstract

Pancreatic cancer is one of the deadliest malignancies, with a very short overall survival—3 to 5 months in advanced stages and only 3% survival at 5 years. According to Global Cancer Statistics 2024, it ranks as the fourth leading cause of cancer death worldwide. Early symptoms are nonspecific, causing most patients to be diagnosed at advanced stages, resulting in poor outcomes and reduced quality of life. A 35-year-old man presented with abdominal swelling and jaundice lasting one month, along with nausea, abdominal fullness, and lower limb edema. Physical exam showed pale conjunctiva, scleral jaundice, warm extremities, and pitting edema. Laboratory tests revealed anemia and increased direct bilirubin; HbsAg was positive. Ultrasound indicated obstructive jaundice and a suspected mass in the pancreatic head, with intrahepatic and extrahepatic bile duct dilation, mud, and ascites. CT scan confirmed pancreatic head masses. Pancreatic carcinoma typically occurs between ages 60-80, with 85% of patients showing obstructive jaundice, pruritus, dark urine, and bile duct obstruction. Symptoms develop gradually, often with weight loss and abdominal pain. Tumors in the pancreatic head cause bile obstruction and rising bilirubin levels without intervention. Although rare, pancreatic head cancer is highly malignant. HBV infection may promote pancreatic cancer by inducing local inflammation and stimulating cancer cell proliferation. Diagnosis is challenging because symptoms usually manifest only at advanced stages.

Keywords: Head of Pancreas carcinoma, obstructive jaundice

INTRODUCTION

Pancreatic cancer is one of the deadliest malignant tumors worldwide, characterized by a very low overall survival rate—only about 3 to 5 months at advanced stages and a five-year survival rate of approximately 3% (Garrido-Laguna & Hidalgo, 2015; Hu et al., 2021; Mizrahi et al., 2020; Tonini & Zanni, 2021). According to the 2024 Global Cancer Statistics, pancreatic cancer ranks as the fourth leading cause of cancer-related deaths globally (Goess & Friess, 2018).

Early symptoms of pancreatic cancer are often nonspecific, leading most patients to be diagnosed at advanced stages. This late diagnosis contributes to poor treatment outcomes, reduced quality of life, and shortened life expectancy. Malignant biliary obstruction is a common complication of pancreatic head cancer, further exacerbating the patient's condition and mortality risk (Dolay et al., 2019; Hackert et al., 2010; Mizuno et al., 2014; Olakowski & Grudzińska, 2023).

Most pancreatic cancer cases occur in individuals aged 60 to 80 years, with about 60-70% of tumors located in the pancreatic head (C. A. of C. and N. B. M. of P. Cancer, 2018). However, atypical cases have been reported in younger patients, such as those aged 35 to 56 years, presenting with symptoms consistent with pancreatic head cancer. The disease frequently causes obstruction of the bile duct, resulting in jaundice, pruritus, dark urine, and pale stools. Additionally, hepatitis B virus (HBV) infection is suspected to contribute to pancreatic cancer pathogenesis by inducing local inflammation and promoting cancer cell proliferation and migration through molecular pathways such as PI3K/AKT. Diagnosing pancreatic cancer remains challenging because symptoms usually appear only at advanced stages (I. E. of P. Cancer, 2016; opportunities, 2015; pathway, 2014).

McGuigan et al. (2018) reviewed the clinical diagnosis, epidemiology, and treatment outcomes of pancreatic cancer, highlighting that 10-20% of cases are identified through painless jaundice. Chen et al. (2016) demonstrated that the hepatitis B virus X protein (HBx) modulates the PI3K/AKT pathway, promoting pancreatic cancer cell proliferation and inhibiting apoptosis.

Feldman and Gandhi (2016) reported that contrast-enhanced CT scans have approximately a 90% positive predictive value in determining pathological characteristics and resectability of pancreatic tumors.

This study presents a novel case of pancreatic head cancer occurring in a younger patient with concurrent hepatitis B infection, which contradicts the typical epidemiological profile. Furthermore, it emphasizes the potential role of HBV in accelerating pancreatic carcinogenesis through specific molecular mechanisms, an area that has been underexplored in pancreatic cancer research. The comprehensive diagnostic approach, combining clinical evaluation, laboratory tests, ultrasonography, and CT imaging, provides a robust framework for assessing this rare presentation (C. A. of C. and N. B. M. of P. Cancer, 2018; Pancreatic cancer: A review of clinical diagnosis treatment and outcomes, 2017; survival, 2020).

The study aims to analyze diagnostic approaches for pancreatic head cancer in patients with hepatitis B infection by identifying clinical symptoms, supporting diagnostic findings, and exploring the pathophysiological link between HBV and pancreatic cancer development. It also seeks to underscore the importance of early detection and a multidisciplinary diagnostic strategy for managing such patients (strategy, 2024).

The findings are expected to enhance clinical and diagnostic understanding of pancreatic head cancer, particularly in patients at risk due to hepatitis B infection. This knowledge is critical for accelerating early diagnosis, improving clinical management strategies, and providing a foundation for further research on the role of HBV in pancreatic carcinogenesis. Additionally, it serves as a reference for healthcare providers to increase vigilance regarding pancreatic cancer cases in younger patients with hepatitis B.

CASE ILLUSTRATION

A 35-year-old Male came with main symptoms of abdominal swelling and jaundice since a month before. The symptoms accompanied with sensation of full-stomach, nausea and oedema both lower extremities. The vital sign revealed blood pressure was 150/80 mmHg, pulse was regular with the rate of 90 x/minute, body temperature 37°C, and respiratory rate 22 x/minute. The physical examination revealed pale conjunctiva and jaundice of sclera, there was no lymph node enlargement on the neck region, pulmonary vesicular breath sound, no wheezing and rhonchi, heart sounds normal (S1-S2), no murmur or gallop. Abdomen was distended and there was tenderness on palpitation at the right upper quadrant of the abdomen. There was shifting dullness (ascites), a palpating liver edge below the right costal margin is three fingers. Extremities there was pitting oedema on pre tibia region.

Laboratory result showed: Haemoglobin 9.0 g/dL, hematocrit 26.4%, leukocytes 12.000 cells/uL, and platelets 180,000 cells/uL, ALT 140 U/L, AST 40 U/L, with albumin 2.2 g/dL and globulin 4.4 g/dL. The renal function was within normal limits, urea 40mg/dL and creatinine 1 mg/dL. The result also revealed direct bilirubin level 6.0 mg/dL and indirect bilirubin level of 3.0 mg/dL. The blood glucose test revealed normal result (100 mg/dL) and the electrolyte level sodium level was 140 mEq/L, potassium level was 3.5 mEq/L, and chloride level was 108 mEq/L.

The initial problem of this based on such result, patient were liver cirrhosis, jaundice, and anaemia. The diagnosis of liver cirrhosis was established based on physical findings of ascites, oedema on both lower extremities. It was considered as liver cirrhosis with differential diagnosis of bile cirrhosis. Early diagnostic test including seromarker test for hepatitis (HbsAg, Anti-HCV), abdominal ultrasonography (USG) and CT-scan abdomen.

The diagnosis of jaundice is established findings of greenish yellow on sclera, jaundice can caused by obstructive such as tumor, mass, stone.

The diagnosis of anemia is established findings pale of conjunctiva with no bleeding signs, on admission, haemoglobin level was 9.0 mg/dL, Mean corpuscular Volume (MCV) 98.0 fL and Mean Corpuscular Haemoglobin (MCH) 30 pg. Normocytic normochromic anemia due to occult blood loss was considered and it was also probably caused by chronic disease. Further test planned such as serum iron (SI), total iron binding capacity (TIBC), ferritin. Examinations of

seromarker test on hepatitis HbsAg revealed positive result. There was no sign of heart failure due to anaemia, the transfusion of blood could be on delayed due to, he declined to be an inpatient.

Based on USG result, there was suspect of mass at the head of pancreas. There was a feature widening of intra-hepatic bile duct (IHBD) (Figure1) and extra-hepatic bile duct (EHBD) with a sludge feature and ascites (Figure2).



Figure 1. Widening of intra-hepatic bile duct (IHBD)



Figure 2. Suspect of mass at the head of pancreas. There was a feature widening of extra-hepatic bile duct (EHBD) with a sludge

CT scan of abdomen with pantras showed an impression of a mass at the head of pancreas, enlargement of pancreatic (Figure3). On further test such CA 19-9, occur increase 132.82 U/ml.



Figure 3. Enlargement of pancreatic

Discussion

The pancreatic carcinoma mostly occurs with prevalence of 50-70% (Partelli S, 2013). The pancreatic carcinoma was predominantly located in the head of pancreas, i.e. about 60-70%; while 5-10% occur in the body of pancreas and 10-15% in the tail. Approximately 15-40% cases are multifocal tumor. Histologically, most of pancreatic cancer is adenocarcinoma, with either moderate of good differentiation (Luo W, 2020).

Almost 85% patients have clinical symptoms of obstruction jaundice, pruritus, dark urine, lightening stool, and impression of obstructive bile duct (cholestatic). Symptoms of malignancy are associated with gradual onset, weight loss, and occasionally accompanied with abdominal pain and back pain.

In general, pancreatic carcinoma occurs mostly on age 60-80 years old. In this presented case, there is contradiction with epidemiologic evidence, i.e. the patient aged 56 years old with symptoms of abdominal distention and jaundice. The history taking revealed symptoms of weight loss, intermittent abdominal pain, and jaundice. The pain was not classified as colic type; therefore it was not appropriate to gall stone disease. In addition, there was a weight loss presenting an initial symptoms of malignancy. Some studies reported that 10-20% of pancreatic cancer is identified based on painless jaundice (McGuigan A, 2018). However, the examination of liver seromarker showed positive result. Bile obstruction may cause by tumor, particularly in the head of pancreatic carcinoma i.e. slight increase of bilirubin level. In pancreatic cancer, bilirubin level tends to increase when there is no intervention.

Several studies have reported an association between pancreatic cancer and several chronic infections, such as hepatitis B and C. It is possible that HBV is

inactive in pancreatic cells and then encodes some functional proteins that induce local inflammation. HBV can trigger the proliferation and migration of pancreatic cancer cells. Hepatitis B virus X protein (HBx) is a small 17-kDa soluble protein encoded by the HBV gene. It is known to be essential for HBV-related oncogenesis in the liver. There is research that states that HBx regulates the PI3K/AKT pathway, which will have the effect of triggering proliferation and inhibiting cell apoptosis, thereby triggering the emergence of malignancy (Chen Y, 2016).

The abdominal USG showed impression of obstructive jaundice with suspect of mass at the head of pancreas. There was a feature widening of intra-hepatic bile duct (IHBD) and extra-hepatic bile duct (EHBD) with a sludge feature and ascites.

Increase CA 19-9 (132.82 U/ml) support diagnosis of pancreas malignancy (Feldman MK,2016). There is no definite examination for tumor seromarker; however, CA 19-9 >37 U/ml shows 55-95% sensitivity. Positive result of CA 19-9 occurs in 80% cases. Other test that can be performed is examination of protein kinase C and microarray (Alicia K Fleming,2017, Leonel pekarek,2022).

The abdominal CT scan showed a mass on the head of pancreas, these are very helpful to find the pathological characteristic of pancreatic cancer. CT scan has 90% positive predictive value to determine which tumor that may not be able to be operated by evaluated the expanding mass into mesenteric vessels, particularly to superior mesenteric artery. There was no regional metastasis found in the patient. This has become prognostic factor in defining tumor resectability (Parteli S,2013 , Feldman MK,2016).

CONCLUSION

Pancreatic head cancer is relatively rare but has a high malignancy. It is possible that HBV-inactivated pancreatic cells then encode some functional protein that induces local inflammation. HBV can trigger the proliferation and migration of pancreatic cancer cells. Making a diagnosis is often difficult because symptoms usually appear after the cancer has reached an advanced stage.

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