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Case Report

Peri-Ampullary Tumour; An Unusual Cause of Upper Gastrointestinal Bleeding

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Abstract

Periampullary tumors are cancers that arise in the region of the ampulla of Vater, where the bile duct and pancreatic duct converge and empty into the small intestine. These tumours can be challenging to diagnose and manage given the region's transitional character and closeness to various structures.

Upper gastrointestinal bleeding may be a rare clinical presentation following tumoral ulceration, erosion into blood vessels or nearby structures or secondary complications like pancreatitis or portal hypertension. Identifying the anatomical origin of these malignancies is usually a herculean task. This will require prompt oesophagogastroduodenoscopy and imaging to determine the source. Immunohistochemistry may be helpful in differentiating these tumours.

We present periampullary tumour an unusual cause of upper gastrointestinal bleeding. A 52 year old male was admitted for evaluation following a 3 months history of weight loss, burning/colicky epigastric pain, easy fatiguability, dizziness, vomiting and passage of malaena.He was fully conscious on admission, pale, tachycardic with a blood pressure of 90/70mmHg.

He had an international normalized ratio (INR) of 1.0. Oesophagogastroduodenoscopy showed a polypoid fungating mass at the1st and 2nd parts of the duodenum. A Computerized Tomogram scan of the abdomen showed a diffuse circumferential duodenal wall thickening of 1st and 2nd parts with reduction in luminal calibre, mildly dilated pancreatic, common bile and common hepatic ducts. Histology showed moderately differentiated adenocarcinoma.

He had a side to side gastrojejunal anastomosis and cholecystojejunostomy and entero-enterotomy following which he received chemotherapy.

Keywords: Periampullary Tumors, Unusual, Upper gastrointestinal bleeding, oesophagogastroduodenoscopy, immunohistochemistry.

INTRODUCTION

Periampullary tumors (PATs) occur near the ampulla of Vater which is a frequent route for bile and pancreatic secretions. The ampulla of Vater is formed by the duodenal aspect of the sphincter of Oddi muscle, which surrounds the confluence of the distal common bile duct (CBD) and main pancreatic duct as well as the papilla of Vater, a mucosal papillary mound at the distal insertion of these ducts on the medial wall of the duodenum. These tumors are heterogenous in nature and pose significant diagnostic and therapeutic challenges due to their complex anatomy and diverse presentations. Periampullary tumors are relatively uncommon, with an annual incidence rate of approximately 2-5 cases per 100,000 individuals. The age of onset is typically between 60 and 70 years, with a slight male predominance [1]. The incidence of these tumors appears to be rising, likely due to enhanced diagnostic techniques and increased clinical awareness [2]. The pathogenesis of PATs involves genetic mutations, chronic inflammation, and environmental factors. Common

genetic mutations include alterations in KRAS, TP53, and CDKN2A genes [3]. Chronic pancreatitis and genetic syndromes such as Peutz-Jeghers syndrome and familial adenomatous polyposis significantly increase the risk [4]. Chronic inflammation and carcinogen exposure, including tobacco use and high-fat diets, further contribute to tumor development [5]. Pancreatic Ductal Adenocarcinoma (PDAC) is the most prevalent periampullary tumor, originating from the pancreatic ductal epithelium. It accounts for approximately 40-70% of cases [6]. Ampullary carcinoma which arises from the ampulla of Vater, is the less common type but can present with obstructive jaundice [7]. Cholangiocarcinoma originates from the bile duct epithelium, frequently occurring in the distal bile duct [8]. Duodenal Adenocarcinoma is malignancy arises from the duodenal lining and may cause gastrointestinal obstruction [9].

These tumours because of their heterogeneous nature present with symptoms related to their location and the resultant obstruction of bile or pancreatic ducts.

Clinical presentations include abdominal pain typically located in the upper abdomen, potentially radiating to the back [10] jaundice, caused by bile duct obstruction, leading to elevated bilirubin levels [11], weight loss and anorexia resulting from systemic effects of the malignancy [12]. Other symptoms include nausea and vomiting particularly if the duodenum is affected, leading to obstruction [13]. Steatorrhoea due to pancreatic insufficiency may also occur [14].

Complications of upper gastrointestinal bleeding (UGIB) though unusual may occur due to tumour growth into adjacent blood vessels or the duodenum [15], peptic ulcer disease from bile reflux and obstruction [16] and portal hypertension in advanced cases with liver involvement can lead to variceal bleeding [17].

Upper gastrointestinal bleeding can present as hematemesis or melena and requires immediate medical intervention [18].

The prognosis of PATs varies by tumor type:

- **Pancreatic Ductal Adenocarcinoma (PDAC):** Generally poor, with a 5-year survival rate around 10% due to late-stage diagnosis [19].
- **Ampullary Carcinoma:** Better prognosis compared to PDAC, with a 5-year survival rate of 30-60% depending on stage and respectability [20].
- **Cholangiocarcinoma:** Prognosis is stage-dependent, with survival rates varying widely [21].
- **Duodenal Adenocarcinoma:** Typically better prognosis than PDAC, with a 5-year survival rate of about 30% [22].

Early detection and surgical resection are crucial for improving outcomes [23].

CASE PRESENTATION

A 52 year old Nigerian male was admitted for evaluation following a 3 months duration of progressive weight loss, generalized body weakness and a burning and occasionally colicky, persistent, non-radiating epigastric pain. He had associated appetite loss, easy fatiguability,occasional dizziness and recurrent non-projectile post-prandial non-billous vomiting. Though he had no hematemesis, he had history of passage of malaena.

The patient was fully conscious on admission, pale, wasted with a markedly tender epigstric region. He was tachycardic with a minimal elevation in blood pressure level of 138/94mmHg.

Initial tests showed a hemoglobin level of 5.9g/dl, a low mean corpuscular volume (MCV) of 54.0fL,low mean corpuscular hemoglobin (MCH) of 18.0pg while his red cell distribution width coefficient (RDW-CV) was 17.7% depicting a secondary hematinic deficiency probably due to chronic gastrointestinal bleeding, and in his case, iron.

He had a positive faecal occult blood test (FOBT)and an international normalized ratio (INR) of 1.0. A peripheral blood film (PBF) showed a mixture of hypochromic microcytes, macrocytes and occasional pencil shaped red blood cells and neutrophilic hypersegmentation.

Following resuscitation with intravenous fluids and blood transfusion, an emergency oesophagogastroduodenoscopy was performed which showed a polypoid fungating mass (figure1) at the1st extending to the 2nd part of the duodenum with easy contact bleeding. Asides haemorrhoids found on lower gastrointestinal endoscopy, other findings were otherwise normal.

While on admission, the patient developed jaundice with a greenish tinge with markedly elevated liver enzymes ALT (123U/L), ALP (3288U/L), Total Bilirubin (12.8 mg/dl) and Direct Bilirubin (6.92 mg/dl) in keeping with an obstructive pattern. His Ca19:9 was normal (20.2IU/ml).

A Computerized Tomogram scan of the abdomen showed a diffuse circumferential duodenal wall thickening of 1st and 2nd parts (more in 2nd part) with reduction in luminal calibre of duodenum and mildly dilated pancreatic, common bile and common hepatic ducts.

He went on to have an exploratory laparotomy with triple bypass involving a side to side gastrojejunal

anastomosis and cholecystojejunostomy and entero-enterotomy folowing which he went on to receive chemotherapy. As of the time of this write up the patient has recuperated well following his treatment carrying but occasionally confined to bed.

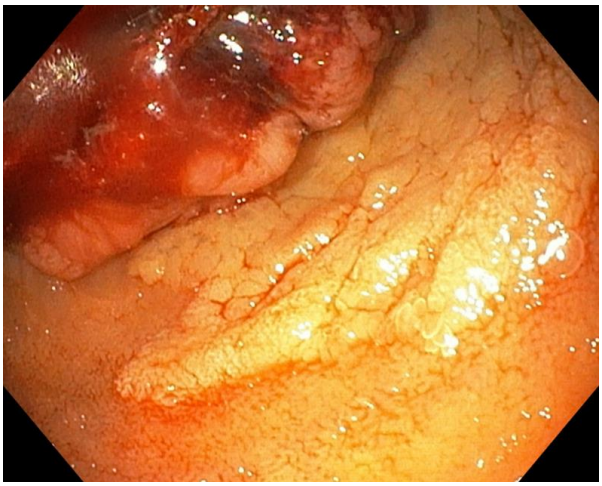

Figure 1: Oesophagogastroduodenoscopy Image

A Polypoid Fungating Mass at the1st Extending to the 2nd Part of the Duodenum Bleeding Especially to Minimal Contact

Multiple biopsies taken for histology showed moderately differentiated aadenocarcinoma. Surface epithelium composed of columnar epithelial cells which can be seen in the top right of the image below with an invasive tumour, seen infiltrating the lamina propria in the lower left.

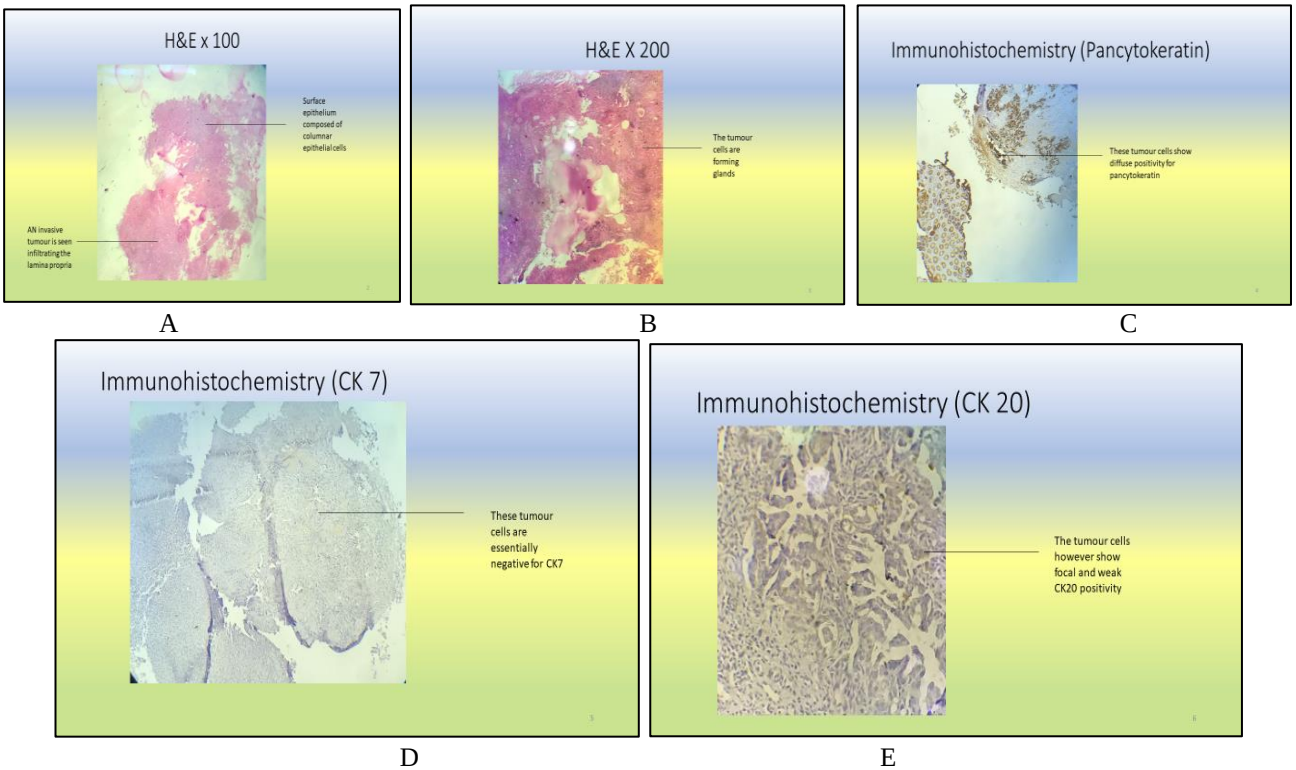

Figure 2: Immunohistochemistry of Periampullary tumour

Pancytokeratin diffuse positivity confirms the epithelial origin of the tumour which is consistent with many PATs.

CK7 negativity and weak CK20 focal positivity help in differentiating the tumour type.

CK negativity and weak CK20 positivity can sometimes be seen in PATs.

DISCUSSION

Upper gastrointestinal bleeding is occurs from structures above the ligament of Treitz. It may be classified as variceal or non variceal depending on the aetiology. Upper gastrointestinal bleeding (UGIB) is a common medical condition that results in substantial morbidity, mortality, and medical care cost. It commonly presents with hematemesis (vomiting of blood or coffee ground-like material) and/or melena (black, tarry stools). In 5 to 10 percent of patients with severe UGIB, it may present as hematochezia. Bleeding from ruptured esophageal varices and peptic ulcer disease are the two most common causes of UGIB all over the world. Bleeding from ruptured varices has consistently remained the most common cause of UGIE in reports from Nigeria and other African countries [24-26]. Acute presentations can be a potentially life threatening medical emergency Commonest clinical presentations include abdominal pain, haematemesis, malaena, haematochaezia due to rapid intestinal transit – palpitation, shortness of breath and in syncope.

Access to endoscopy is a major determining factor in the prognosis of the disease [27]. Early endoscopy (within 24 h) is preferable to later endoscopy in patient groups at high and low risk [28-30] reflected in recent guidelines.

Tumors arising around the ampulla of Vater in this region are collectively referred to as periampullary may originate from any of the structures in the vicinity of the ampulla including pancreas, CBD, duodenum and the ampulla itself. Their respective secretions empty into the second part of the duodenum through the papillary opening resulting in to a myriad of clinical presentation with overlaps. Diagnosis is usually made by the use of magnetic resonance imaging, OGD, ultrasound, endoscopic retrograde pancreatography and histology. This can be quite challenging especially in resource poor settings as ours where these facilities are not readily available.

In this index case a duodenal mass was found to be the cause of the UGIB with histology showing an adenocarcinoma, intestinal type. This is typically a very rare cause of UGIB generally and in our study environment Recent research has proposed subtypes of ampullary carcinomas, which include intra-ampullary, ductal, periampullary duodenal, and ampullary not otherwise specified carcinomas, based on a detailed assessment of their gross appearance in correlation with microscopic findings. Moreover, ampullary can be further classified as intestinal type, pancreaticobiliary, or mixed based on the tumour's histomorphology and immune-histochemical profile [31].

Duodenal carcinoma are more common than jejunum and ileum despite the fact it only contributes 0.3% of gastrointestinal malignancies. This is because this carcinoma constitutes 50% of small intestinal malignancies [32]. Duodenal type periampullary cancer as was presented in this case posed a diagnostic dilemma in not being a common case of UGIB, presence of jaundice while on admission which raised suspicion of ductal obstruction. The strategic location of the tumor in the bile outflow tract leads to obstructive jaundice in up to 72%-90% [33]. The clinical manifestations of duodenal carcinoma are nonspecific that diagnosis is often unintentional and late. It is also difficult due to its rare incidence, indolent course and non-typical clinical manifestations, which is worsened by the fact that patients usually come with nonspecific symptoms without any indication for esophagogastroduodenoscopy [34].

The pancytokeratin diffuse positivity confirms the epithelial origin of the tumour, which is consistent with many periampullary carcinomas.

The CK7 negativity and CK20 focal positivity helps in differentiating the tumour. CK7negativity and weak CK20 positivity might suggest a diagnosis more in line with certain types of gastrointestinal tumours such as those of colonic origin, which can sometimes be seen in periampullary masses. This immunohistochemistry can assist in narrowing down the differential diagnosis and guiding further management for the patient with a periampullary mass. Immunohistochemistry alone are no definitive for confirming a periampullary tumour, but they strongly suggest the presence of an epithelial malignancy, which is consistent with periampullary tumour. However, a definitive diagnosis of a PAT typically requires correlating these immunohistochemical findings with clinical presentations, imaging studies and histopathological examination. The combination of these results supports the diagnosis but should be interpreted alongside other diagnostic findings.

CONCLUSION

Upper gastrointestinal bleeding is an unusual clinical presentation of periampullary tumours in our environment. Identifying the anatomical origin of these malignancies is usually a herculean task especially in resource limited settings. This will require high index of suspicion, oesophagogastroduodenoscopy, histology with or without immunohistochemistry and imaging techniques. Prompt diagnosis and early therapy are essential to a better prognosis and longer life expectancy.

Consent: Patient signed a consent form to the write up of this case report following an agreement that his name and photograph will not appear in the manuscript.

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Conflicts of Interest: There are no conflicts of interest.

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