Duodenal bulb adenocarcinoma - Case Report and Literature Review

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Introduction:

About 0.3% to 0.5% of gastrointestinal malignancies are duodenal adenocarcinomas, an uncommon gastrointestinal malignancy that was first described by Hamburger in 1746. Due to the vague nature of duodenal adenocarcinoma symptoms, most patients arrive with advanced disease and a poor prognosis with high morbidity and death rates. Although it can originate anywhere in the duodenum, including the duodenal bulb, duodenal adenocarcinoma most frequently affects the descending duodenum (D2) [1, 2]. Here, we present a case report of an extremely rare location of duodenal adenocarcinoma in a patient with complex medical comorbidities. We also provide a comprehensive literature review on duodenal adenocarcinoma, focusing on their occurrence in the duodenal bulb.

Case presentation:

An 80-year-old lady with a past medical history of hypertension, dyslipidemia, and ischemic stroke on aspirin and atorvastatin presented complaining of general weakness for the last few weeks before presentation, which had been getting worse with time. According to the patient, she is feeling fatigued all day and having SOB and palpitation on minimal exertion. The patient denied any chest pain, fever, cough, vomiting, bloody stool, or melena. Upon examination, vital signs were within normal limits. She was pale but not in acute distress, with residual weakness in the right upper and lower limbs. The abdomen was soft, with minimal tenderness in the epigastric area. The digital rectal exam was unremarkable.

Methods:

Blood test results (Table 1) showed low Hemoglobin, positive stool occult blood, and elevated tumor markers (including CA 125, CA 19-9, and CEA). Esophagogastroduodenoscopy (EGD) revealed a distal duodenal bulb large fungating, 5 cm infiltrating mass with partial obstruction of the lumen of the duodenal bulb extending to the second portion of the duodenum (Figure 1).

Biopsies from the lesion revealed infiltrating adenocarcinoma, moderately differentiated (Figure 2). Immunohistochemical stains (IHC) showed the tumor positive for CK7, CK 19, and PAX8 (weak). IHC was negative for CK 20, CDX2, and SATB2. Computed tomography (CT) of the chest, abdomen, and pelvis performed after EGD showed an area of hypo-attenuation in the region of the gastric antrum and proximal duodenum along with an adjacent enlarged lymph node measuring 1.4 x 1.2 cm concerning neoplastic involvement. The scan was negative for distant metastasis. The patient was referred to the Oncology and Surgical service for interdisciplinary decision-making regarding further management.

Discussion:
The small intestine comprises a majority of the entire length of the gastrointestinal tract. However, it is a rare location for cancer and accounts for less than 0.5% of all gastrointestinal malignancies. Adenocarcinoma is the most common malignant tumor of the gastrointestinal tract, and the duodenum is considered the most common place for small intestine adenocarcinoma. [1,2].

While duodenal adenocarcinoma most commonly occurs in the descending part of the duodenum, adenocarcinoma can originate from any part of the duodenum, including the duodenal bulb. [3,4]. Patients usually present with advanced disease with vague and nonspecific symptoms, including abdominal pain, vomiting, and intestinal obstruction, with overall survival after five years is 25%-35%. [2]. There are no apparent predisposing factors for duodenal cancer in the literature. However, duodenal adenomas, such as familial adenomatous polyposis, for example, increase the risk. Alcohol, coffee, smoking, and dietary factors also seem to be risk factors. [4].

EGD is considered the first-line diagnostic modality for the evaluation of duodenal cancer, which allows visualization and biopsy with a high diagnostic rate. In addition, Endoscopic ultrasound (EUS) may be performed simultaneously to evaluate local extension or lymphadenopathy. [4]. Several tumors with different histogenesis can develop in the gastrointestinal (GI) tract. Frequently, it is difficult to distinguish between primary tumors and metastatic malignancies of unknown origin. Immunohistochemistry allows for the use of various antibodies: the integrated evaluation of specific staining can lead to a correct diagnosis. Using cytokeratin, mucins, and catenin might be quite beneficial in most circumstances. In general, small intestinal adenocarcinomas, as in our case, have diffuse positivity for CK7 and lower CK20 and CDX2 expression rates than large intestine adenocarcinomas. [5].

In the absence of metastatic disease, surgical resection with lesion-free margins is the mainstay of treatment for duodenal adenocarcinoma. For adenocarcinoma of the first and second parts of the duodenum, pancreaticoduodenectomy is the recommended surgical technique. In contrast, segmental resection is frequently reserved for adenocarcinoma of the third and fourth parts. Pancreaticoduodenectomy is considered a superior surgical intervention in terms of wider resection margin and more extensive regional lymph node clearance when compared with segmental resection. [2,4].

Duodenal bulb adenocarcinoma is exceptionally rare compared to other parts of the duodenum. The exact causes have not yet been discovered, but it has been suggested that the duodenal bulb mucosa may be physiologically and immunologically privileged to escape oncogenic transformation.

Conclusion and result:

Duodenal adenocarcinoma is a rare gastrointestinal malignancy but potentially carries large morbidity and mortality as many patients present with advanced disease. Although duodenal adenocarcinoma most commonly occurs in the second part of the duodenum, duodenal bulb adenocarcinoma is exceptionally rare. In this case report, we shed light on the importance of considering duodenal malignancies, even in unusual locations like the duodenal bulb, when evaluating patients with nonspecific gastrointestinal symptoms, including upper gastrointestinal bleeding. Early recognition, prompt endoscopic evaluation, and surgical intervention are crucial for successful management.

References (Numerical)


Disclosure

Conflict of Interest:
The authors report no conflicts of interest in this work.

Patient Consent:
Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

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Authors contribution:
Dr. Mohammad N. Kloub - literature review and Manuscript writing.
Dr. Atheer Anwar - literature review and Manuscript writing.
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Dr. Muhammad Hussain - Manuscript review and images.
Dr. Raed Atiyat - Manuscript review and images.
Anoud Alatiyat - Manuscript writing.
Dr. Mehul Shah - Revision and supervision.

Figure 1
EGD image showing duodenal bulb large fungating, 5 cm infiltrating mass with partial obstruction of the lumen of the duodenal bulb extending to the second portion of the duodenum

Figure 2
Histopathology slide image of a biopsy from duodenal bulb lesion showing infiltrating adenocarcinoma, moderately differentiated.

Table 1
Blood test result.
<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Normal Level</th>
</tr>
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<tbody>
<tr>
<td>Hemoglobin</td>
<td>6.3 g/dL</td>
<td>12-15.5 g/dL</td>
</tr>
<tr>
<td>MCV</td>
<td>79 fL</td>
<td>81.6-98.3 fL</td>
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<tr>
<td>WBC</td>
<td>10.9 10^3/uL</td>
<td>4.40-11.0 10^3/uL</td>
</tr>
<tr>
<td>platelets</td>
<td>492 10^3/uL</td>
<td>150-450 10^3/uL</td>
</tr>
<tr>
<td>BUN</td>
<td>12 mg/dL</td>
<td>6.0-24.0 mg/dL</td>
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<tr>
<td>Creatinine</td>
<td>0.70 mg/dL</td>
<td>0.5-1.0 mg/dL</td>
</tr>
<tr>
<td>CA19-9</td>
<td>&gt;700 U/ml</td>
<td>0-34 U/ml</td>
</tr>
<tr>
<td>CEA</td>
<td>8.3 ng/ml</td>
<td>0-3 ng/ml</td>
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