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Case report

Duodenal Adenocarcinoma: A Rare Finding. A Case Report

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Abstract

Introduction: Duodenal adenocarcinoma is an uncommon but aggressive malignancy. Surgical resection is the cornerstone of treatment, and in some cases, pancreatoduodenectomy or segmental duodenal resection is required. In multimodal management, chemotherapy and radiotherapy play a fundamental role. **Objective:** To describe the case of an elderly patient with a tomographic finding of a duodenal mass causing near-complete luminal obstruction, who underwent open duodenectomy and cholecystectomy, revealing intraoperatively a tumor in the third and fourth portions of the duodenum with involvement of retroperitoneal tissues. **Discussion:** Duodenal neoplasms are extremely rare. Surgical intervention remains the treatment of choice for this pathology. **Conclusions:** Duodenal adenocarcinoma is a very rare condition. Its clinical presentation is nonspecific, necessitating suspicion in patients with associated risk factors.

Keywords

Adenocarcinoma, duodenal diseases, abdominal pain, general surgery.

INTRODUCTION

Duodenal adenocarcinoma is an uncommon condition, with an incidence of less than 1% of gastrointestinal cancers[1]. Compared to other periampullary oncologic pathologies, more favorable outcomes can be achieved with surgical treatment for this entity[2]. Most duodenal adenocarcinomas originate in the second portion of the duodenum, followed by the third and fourth portions, but those in the first portion are even rarer[1]. There are different risk factors associated with the development of this pathology, including dietary changes, alcoholism, smoking, presence of familial adenomatous polyposis, Gardner's syndrome, among others[1,3].

Its clinical presentation is generally non-specific, although symptoms such as nausea, vomiting, asthenia, lethargy, or weight loss may be present[4], with abdominal pain being the most frequent symptom[5,6]. The presence of anemia, jaundice, or gastrointestinal obstructive symptoms suggests advanced disease[6,7]. Due to its non-specific symptomatology, many patients are diagnosed late[5-7]. Esophagogastroduodenoscopy is an alternative that allows for visualization of the duodenum and performance of biopsies; however, contrast-enhanced computed tomogra-

phy helps assess nearby structural involvement, resection margins, and surgical planning[8,9]. For this type of pathology, abdominal ultrasound is not useful for tumors smaller than 2 cm in diameter[2].

The objective of this case report is to present a patient with duodenal adenocarcinoma, a pathology that represents a diagnostic and surgical challenge.

CASE DESCRIPTION

This involves a 75-year-old male patient with a history of hypothyroidism, arterial hypertension, benign prostatic hyperplasia, cholelithiasis, and chronic cholecystitis. He presented with a clinical picture of vomiting and involuntary weight loss of approximately 30 kilograms over six months. Consequently, he was evaluated at an external institution where an esophagogastroduodenoscopy was performed. This revealed the esophagus and stomach with normal morphology and caliber, but in the duodenum, an ulcerated polypoid lesion with irregular borders and an infiltrative appearance was found, causing a 90% reduction in the lumen caliber (**Figure 1**). A biopsy was therefore performed, which reported seven fragments of duodenal mucosa, all showing malignant tumor lesions of epithelial origin, moderately differentiated, and composed of intermediate-sized cells with scant cytoplasm and hyperchromatic, moderately pleomorphic nuclei. The samples were arranged in tubes, glands, papillae, and digitiform projections that infiltrated the full thickness of the evaluated fragments. A moderate mononuclear inflammatory infiltrate and a slight desmoplastic response were also present, without vascular or lymphatic invasion or perineural invasion by the tumor cellular elements.

As a result, he was referred to our institution, where staging studies were performed: a contrast-enhanced computed tomography of the abdomen and pelvis, which reported an irregular thickening of the walls in the third portion of the duodenum, reaching a thickness of up to 15 mm, in addition to adjacent mesenteric lymphadenopathy, cholelithiasis, atherosclerosis of the aorta, and an enlarged prostate (**Figure 2**).

He was evaluated by hepatobiliary surgery, where an open duodenectomy and cholecystectomy were considered. Intraoperative findings revealed a mass involving the third and fourth portions of the duodenum with involvement of retroperitoneal tissues, without contact with the pancreas (**Figure 3**). A duodenectomy plus a lateral-lateral duodenojejunal reconstruction plus placement of a nasoduodenal

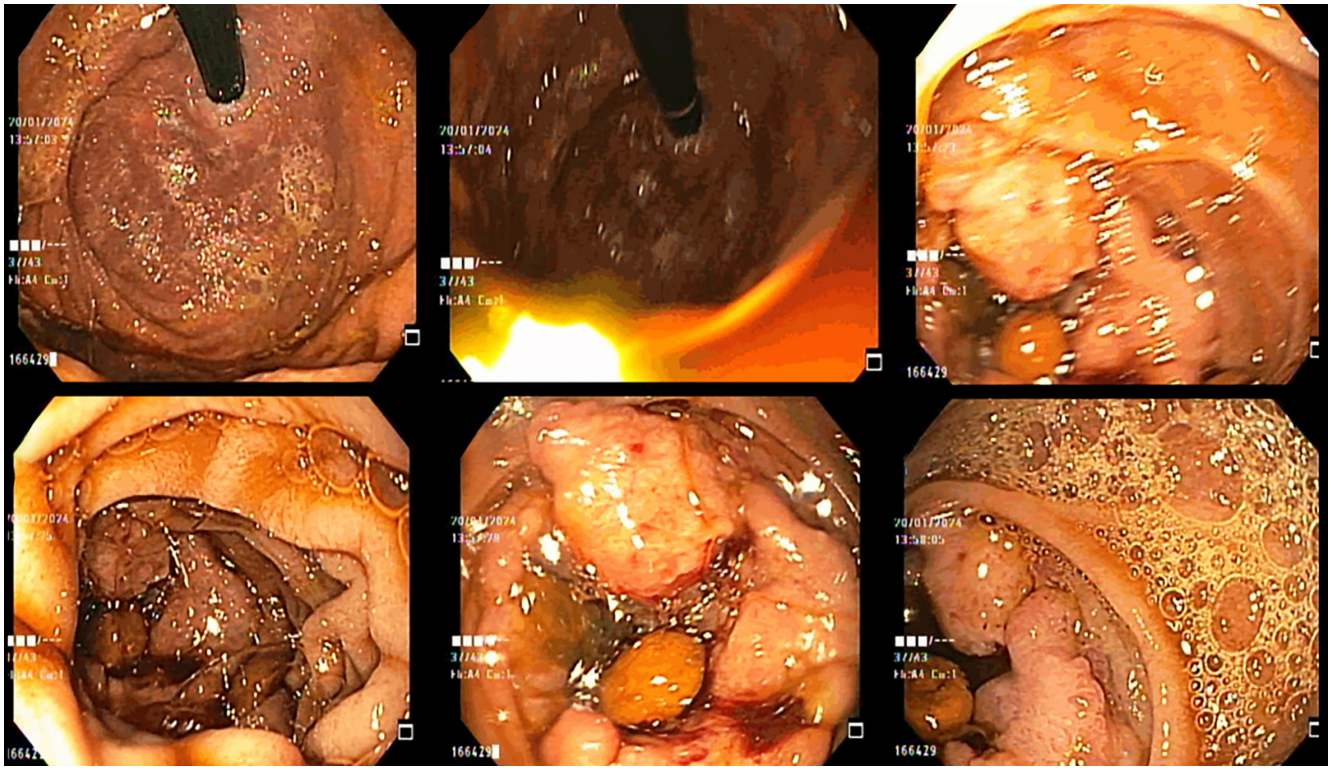

Figure 1. External esophagogastroduodenoscopy showing an ulcerated polypoid lesion. Source: Gastroenterology Service, Specialists Center. Selected by the authors.

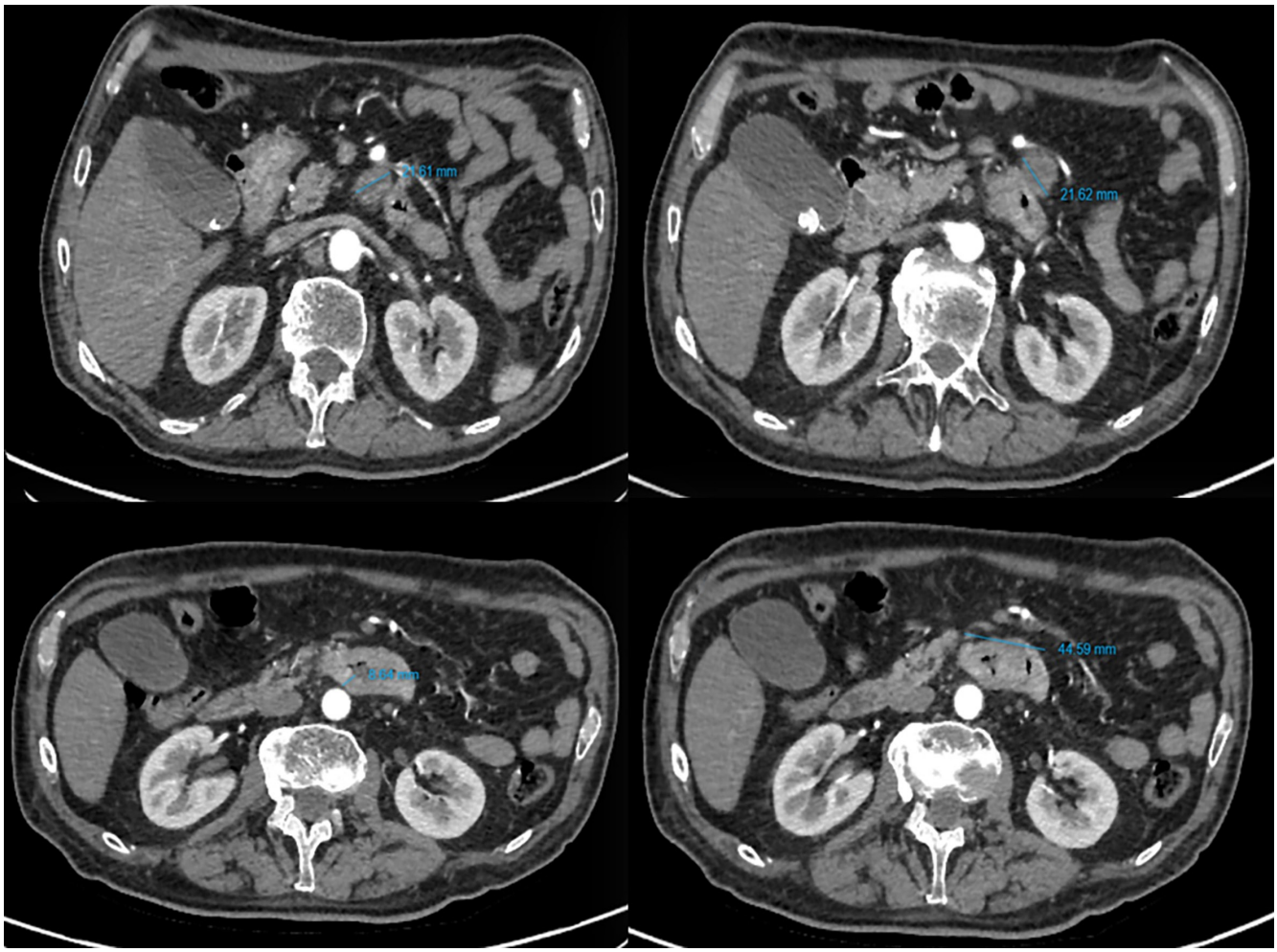

Figure 2. Contrast-enhanced computed tomography of the abdomen and pelvis reporting an irregular thickening of the walls in the third portion of the duodenum, adjacent mesenteric lymphadenopathy, cholelithiasis, atherosclerosis of the aorta, and an enlarged prostate. Source: Radiology Service, Hospital Internacional de Colombia. Selected by the authors.

feeding tube and a cholecystectomy were performed. The histopathological study found a poorly differentiated grade 3 adenocarcinoma located in the third and fourth portions of the duodenum, with tumor invasion through the muscularis propria into the subserosa and mesenteric tissue without serosal penetration, and no lymphovascular invasion. The proximal and distal margins were free of tumor involvement, and at the nodal level, 12 lymph nodes were involved by the malignant tumor lesion. The pathological staging (pTNM, AJCC 8th edition) was: pT3, pN1.

The patient had a complicated postoperative course due to mechanical ileus and was re-evaluated by hepatobiliary surgery, where an exploratory laparotomy and adhesiolysis were considered. Findings included severe adhesive syndrome from previous surgery, multiple adhesions, an area of small bowel volvulus due to adhesions, a pinpoint stenosis in the jejunum 50 cm from the duodenojejunal anastomosis, and multiple segments of the small intestine with severe edema and marked stenosis with retrograde dilation. There were also stenotic and edematous areas, a segment of jejunum approximately 25 cm long, a segment of ileum, a distal ileum segment of 20 cm, and the previous duodenojejunal anastomosis without signs of stenosis.

Despite this, the patient maintained persistent intestinal ileus, along with gastroparesis and peristalsis alterations possibly associated with his surgical pathology, so treatment with prucalopride was initiated, with subsequent improvement. Regarding the nodal involvement documented in the postoperative histopathological study, he was evaluated by oncology with an indication for systemic therapy pending geriatrics assessment; however, geriatrics considered that, given the patient's sarcopenia, previous

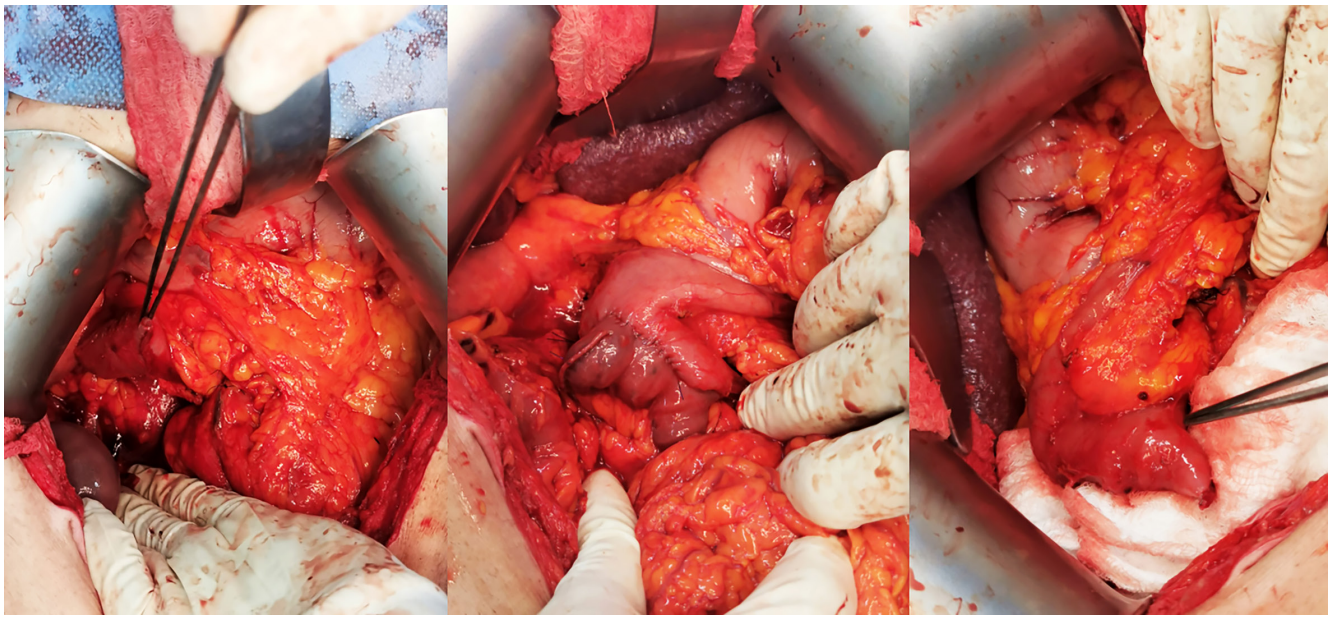

Figure 3. Intraoperative Finding: mass involving the third and fourth portions of the duodenum with involvement of retroperitoneal tissues. Procedure: duodenectomy plus lateral-lateral duodenojejunal reconstruction plus placement of a nasoduodenal feeding tube and cholecystectomy. Source: Surgery Service, Hospital Internacional de Colombia. Selected by the authors.

mixed delirium, and malnutrition, initiating systemic therapy was not recommended due to the high risk of chemotoxicity, which could further affect his quality of life and clinical status until his nutritional status was optimized. During his prolonged stay, he was managed multidisciplinary, with daily follow-up until he was discharged with respective follow-up appointments. He was evaluated at one week and one month post-discharge, with no abdominal symptomatology during this period.

DISCUSSION

Duodenal adenocarcinoma is a rare entity[10]. The origin of most ileal tumors is neuroendocrine; however, adenocarcinoma is the most common cancer in the duodenum[1]. It is most frequently located in the second portion of the duodenum, followed by the third and fourth portions[10]. Its symptoms are not very pronounced initially, which delays diagnosis. In most cases, clinical manifestations appear only when the tumor reaches a sufficiently large size, sometimes being detected at an advanced stage[11]. The triad of weight loss, vomiting, and nausea have been described as initial symptoms, as well as an association of these symptoms with jaundice, gastrointestinal bleeding, and diarrhea[10].

For diagnosis, on one hand, barium follow-through has a sensitivity of around 85%, and on the other hand, upper gastrointestinal endoscopy achieves a sensitivity of up to 90% and allows for visualization and biopsy of the lesion[1,10]. Ultrasound and computed tomography are more useful for staging and determining the resectability options of the lesion[11], as in the presented clinical case, since the size of the lesion documented during endoscopy necessitated staging and understanding of the anatomy, which allowed for defining additional therapeutic approaches. Surgery is considered the only option when attempting curative treatment, and pancreatoduodenectomy is the technique of choice for tumors located in the second portion of the duodenum because it allows for an en bloc resection. It is advised that this technique always be accompanied by regional lymphadenectomy[1,10,11]. For tumors located in other duodenal portions, some authors propose, in addition to pancreatoduodenectomy, performing a segmental resection, considering it a lower surgical risk alternative with equal oncological validity, provided that clear surgical margins are obtained[1,10]. The most common causes of unresectability are distant metastases and infiltration of the mesenteric root, which confers a worse prognosis for patients. Duodenal adenocarcinoma has a great tendency for local invasion, particularly into the liver, more so than distant metastasis.

Regardless of the approach, the status of the surgical margins affects survival. In a study conducted by Sohn et al., the experience from Johns Hopkins was reported, showing a 5-year survival of 58% in patients with negative margins compared to 0% in patients with positive margins[1]. In another

study from a high-complexity center, 5-year rates of 55% and 0% were found for R0 and R1 patients, respectively[1]. Similarly, in another population group, the 5-year survival was about 51%[11]. Surgery and lymph node infiltration are the main determinants of survival[1,11], and a higher lymph node retrieval has been independently associated with better survival for patients with duodenal adenocarcinoma[1]. In the case of patients eligible for palliative surgery who present with gastroduodenal obstruction, procedures such as gastrojejunostomy or duodenojejunostomy can be an alternative[1]. In our case, given the persistence of the patient's symptoms, rapid surgical intervention was necessary, which allowed for symptom control; however, the marked presence of nodal involvement necessitated a multidisciplinary evaluation, which, given the nutritional deterioration, deemed it inadvisable to initiate systemic therapy as an additional treatment. This underscores the importance of timely diagnosis to avoid reaching advanced stages of the disease, as well as the importance of multidisciplinary assessment at the beginning, during, and after diagnosis.

The utility of adjuvant therapies remains to be determined, as a clear benefit has not been demonstrated to date. Further studies are needed to evaluate other management possibilities, such as chemotherapy and radiotherapy, since the small number of patients does not currently allow for valid conclusions to be drawn.

CONCLUSION

Duodenal adenocarcinoma is a very uncommon pathology. Its clinical presentation is often very non-specific, so it should be suspected in those patients with associated risk factors. Diagnosis should be made by gastroscopy or duodenoscopy in conjunction with other techniques, such as tomography, to delineate the tumor involvement. The main prognostic factor in this pathology is lymphatic involvement.

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Ethical Responsibilities

This work was conducted in accordance with the governing standards of current clinical research and received prior approval from the institution's scientific committee. Authorization and informed consent were obtained from the patient. The guidelines established in Resolution 008430 of 1993 from the Colombian Ministry of Health and the Declaration of Helsinki established in 1964, adapted to its latest revision in October 2013, were followed. The recommendations of good clinical practice guidelines in clinical research and the basic ethical principles inherent to this type of research design—respect for persons, beneficence, and justice from the Belmont Report—were applied.

Protection of People and Animals

The authors declare that no experiments were performed on humans or animals for this research.

Conflicts of Interest

The authors declared no conflicts of interest.

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Use of Artificial Intelligence

The authors declared that they did not use artificial intelligence (AI)-assisted technologies (such as large language models, chatbots, or image creators) in the production of this work.

Author Contributions

All authors participated in the design and development of the research protocol, collection of patient data, discussion of the clinical course, and preparation of the manuscript.

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