Introduction

The small intestine comprises about 80% of the total length of the intestinal tract and about 90% of the mucosal surface. Tumors in this area are rare in general, but are most common in the duodenum (1). According to Santoro (2), duodenal tumors make up about 35% of benign and 17% of malignant growths in the small intestine, while 0.3% of all malignant gastrointestinal tract tumors originate in the duodenum.

Benign growths are generally non-symptomatic, with only 25% of cases presenting signs attributable to duodenal diseases. They are often found only during autopsy. The incidence varies considerably according to the caseload, but is likely to rise due to the increased use of diagnostic endoscopic examinations (3).

Moulinier (4) reported 14 benign duodenal tumors in 1000 endoscopies, while Shindo (5) found 3 in 134. Frattòn and colleagues described the endoscopic appearance of 14 duodenal tumors found in 700 duodenoscopies. Two of these were primary tumors, while the others were benign growths, with a strong prevalence of Brunner’s gland hyperplasia (6).

The most common benign tumors are leiomyomas and adenomas. Treatment depends on the site, histological type, extension and patient compliance (7).

Malignant tumors comprise 75% of symptomatic duodenal tumors and, when possible, require surgery. The monitoring and diversified multidisciplinary treatment of four patients with duodenal tumors led us to make the observations discussed in this article.

Patients and methods

The cases of four patients (three men and one woman) aged 35 to 73 years and suffering from duodenal growths with different features that required a diversified therapeutic approach (Table 1) are reported herein.

Case 1 - 58-year-old man with gastroduodenal transit impairment due to duodenal stenosis caused by carcinoma of the first segment of the duodenum. The patient underwent subtotal gastrectomy with resection of the first segment of the duodenum. The carcinoma had not infiltrated the margins and the histological examination suggested carcinoma with unspecified neuroendocrine histological features. The patient was prescribed treatment with somatostatin, but one year later a metastasis was found in the fourth liver segment, verified histologically following metastasectomy. A year later the patient presented additional multiple liver metastases, which led to his death.

Case 2 - Woman, aged 35 years, with dilation of the main bile duct in the absence of calculi and thickening of the gall bladder walls in chronic cholecystitis. During open cholecystectomy, cholangiography revealed an obstacle in the papilla. Opening of the duodenum revealed an obstructive growth in the papilla (not found on gastroduodenoscopy) about 1 cm in diameter. Extemporaneous histological examination indicated a carcinoid tumor of Vater’s papilla.

SUMMARY: Duodenal tumors: four case reports.


We report 4 cases of neuroendocrine tumors of the duodenum. Signs and symptoms were non-specific. The choice of surgery depended on the site and stage of the tumor and any concomitant diseases.

KEY WORDS: Duodenal carcinoid - Duodenal surgery - Duodenal somatostatinoma - Duodenal cancer
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A duodenocephalopancreatectomy (DCP) was performed, with direct closure of the pancreatic stump. The definitive histological examination confirmed the diagnosis. We followed the patient for at least 10 years after surgery. Apart from her considerable weight loss due to intestinal malabsorption, there were no signs of recurrence (8).

Case 3 - Man, aged 73 years, who had been complaining of dyspepsia, asthenia and slight anemia for around a month. Endoscopy revealed an ulcerated growth in the gastric antrum, extending along the distal tract. A hypertrophic plica, covered with normal mucosa, was also found in the first segment of the duodenum. Biopsies detected an intestinal gastric adenocarcinoma (Lauren classification) and a hyperplastic duodenal polyp with diffuse complete intestinal metaplasia. There was also chronic atrophic gastritis in the absence of Helicobacter pylori infection.

A total body CT confirmed the gastric tumor and also revealed a vegetative polypoid growth in the first duodenal segment, maximum diameter 2 cm, which had not been found on endoscopic examination. There were 1-cm lymphadenopathies in the celiac tripod and around the emergence of the superior mesenteric artery.

The patient underwent subtotal gastrectomy with lymphectomy and removal of the duodenal polyp. Histological examination confirmed the intestinal type gastric adenocarcinoma (G3), and lymph node metastasis with extranodal extension in just 1 lymph node of 24. The duodenal growth was found to be a carcinoid tumor (cells positive on staining for somatostatin).

Around 2 years after surgery the patient developed liver metastases and peritoneal carcinomatosis, leading to his death (9).

Case 4 - Man, 52 years, whose sole symptom was gastroesophageal reflux of recent onset. Endoscopy revealed diffuse hyperemia in the pharynx and larynx, as with acid reflux, cardias mucosa normally located, slight hyperemia of the antrum and a 12-mm polypoid growth with central alteration in the second duodenal segment. Biopsies excluded HP infection and histological examination of the duodenal growth confirmed that it was a well-differentiated neuroendocrine carcinoid tumor.

The growth was removed via endoscopy and definitive histological examination of the polyp confirmed the diagnosis. Removal of the lesion resolved the gastroesophageal reflux, which was thus probably due to the obstruction caused by the duodenal growth.

Subsequent investigations (Octreoscan, CT/PET, US-guided endoscopy and biopsy in the surgical area after six months) confirmed the complete removal of the growth (Figs. 1, 2). There were no signs of recurrence one year later.

Discussion

Tumors of the small intestine are relatively rare. The duodenum is the most frequently affected tract, comprising 30-50% of cases (3, 6, 10) in comparison with the jejunum (23%) and ileum (16%) (10). The small intestine might be more “resistant” to the onset of tumors for the following reasons:

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**Table 1 - Scheme summarizing the cases of duodenal tumors.**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Age (years)</th>
<th>Location</th>
<th>Histological type</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Man</td>
<td>58</td>
<td>First segment</td>
<td>Neuroendocrine carcinoma</td>
<td>Sub-Total gastrectomy</td>
</tr>
<tr>
<td>2</td>
<td>Man</td>
<td>35</td>
<td>Juxtapapillary</td>
<td>Carcinoid</td>
<td>Duodenoccephalo-pancreatectomy</td>
</tr>
<tr>
<td>3</td>
<td>Man</td>
<td>73</td>
<td>First segment + Gastric carcinoma</td>
<td>Somatostatinoma</td>
<td>Sub-total gastrectomy</td>
</tr>
<tr>
<td>4</td>
<td>Man</td>
<td>52</td>
<td>Second segment</td>
<td>Carcinoid</td>
<td>Endoscopic Resection</td>
</tr>
</tbody>
</table>

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**Fig. 1** - Duodenal carcinoid (endoscopic image).

**Fig. 1** - Immunohistochemistry demonstrates positivity to cytokeratin AE1/AE3 with predominant expression type “Dot Like” and positive staining for chromogranin A.
Conclusions

The rarity of duodenal tumors and the anatomic characteristics of this site means that the choice of treatment necessarily varies according to the segment affected, the extension of the tumor and the presence of any concomitant diseases. Early diagnosis can influence subsequent therapeutic choices, even if the initial symptoms are almost always non-specific, scarce or totally absent.

In any case, even non-specific symptoms such as gastroesophageal reflux should not be underestimated and should indicate the need for further diagnostic investigation.
Duodenal tumors: four case reports

References