

A large Brunner's gland adenoma: an unusual cause of gastrointestinal bleeding

Case report and literature review



Ann. Ital. Chir., 2010 81: 147-151

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A large Brunner's gland adenoma: an unusual cause of gastrointestinal bleeding. Case report and literature review.

Brunner's gland adenoma is a rare benign tumour of the duodenum. Its most common location is the posterior wall of the duodenum near the junction of its first and second portion. It is usually small and asymptomatic often discovered incidentally with upper gastrointestinal endoscopy, but sometimes may become large causing symptoms (haemorrhage or intestinal obstruction). We report a rare case of a very large Brunner's gland adenoma in a 38-year-old female presenting with severe anaemia but without obstructive symptoms and detected by ultrasonography. The tumour was managed by surgical removal and during a six month follow-up the patient remained symptom-free without any recurrence. The literature on Brunner's gland adenoma is reviewed.

KEY WORDS: Brunner's gland adenoma, Large Brunneroma Surgical excision, Upper gastrointestinal bleeding.

Introduction

Although the small intestine constitutes 75% of the gastrointestinal tract, tumors are extremely rare (about 5%). Duodenum representing only 4% of the small intestine has a relatively high proportion of all the tumors as compared to the jejunum and ileum. Adenomas are the most common duodenal tumors including adenomatous polyps and Brunner adenoma¹⁻³. Brunner's glands, described by the anatomist Brunner in 1688, are submucosal mucin-secreting glands. Their localization are in the duodenal bulb and progressively decrease in size and number in the distal portion^{4,5}. Brunner's glands secrete an alkaline fluid composed of mucin which protect the duodenal epithelium from the acid chime of the stomach⁶⁻⁹. Brunner's gland adenoma, also known as Brunneroma or polypoid hamartoma, is a rare, benign

tumor arising from the Brunner's glands that exceptionally may evolve towards a malignant transformation¹⁰⁻¹². These lesions, firstly described by Curveilheir in 1835, manifest occasionally as a rare cause of duodenal obstruction or upper gastrointestinal hemorrhage, and require surgical treatment^{6,8,13,14}.

The present is a case of large Brunner's gland adenoma resected by surgery with literature review. Aetiology, clinical picture, differential diagnosis and treatment of this rare tumor are discussed.

Case report

A 38-year-old female referred about six months a severe anemia was required blood transfusions. Endoscopic examination revealed ulcer in the duodenal bulb treated by antacids and H2 blockers. When the patient was admitted to our Department of Surgical Sciences vital signs were normal but severe anaemia and vague epigastric discomfort after meals without nausea, vomiting, epigastralgia, melena or obstructive symptoms was reported. On admission she received blood transfusions, Hb 6,8 g/dl (normal 12-16 g/dl). She denied weight loss and

Pervenuto in Redazione Febbraio 2010. Accettato per la pubblicazione Aprile 2010.

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any recent intake of non-steroidal anti-inflammatory drugs. The physical examination had no unremarkable finding. The abdomen was soft without palpating pain and jumping pain. An ultrasonography was carried out showing the presence of a endoluminal mass in the first and second portion of the duodenum measuring 5,8 x 4,8 cm (Fig. 1). On upper endoscopy demonstrated normal esophagus and stomach. A large polyp with a short peduncle completely occupying the duodenal lumen was seen, prolapsing between the bulb and the second part of the duodenum (Fig. 2a-b). Histological examination of the multiple biopsy obtained during endoscopy were normal (Fig. 2c). At operation, a duodenal mass was easily palpated. A longitudinal duodenotomy well distant to the pylorus removal of what appeared to be a benign tumor attached by a short peduncle with a large base to the second part (posterior and medial wall) of the duodenum. The polyp was excised with its base, and the duodenotomy was closed. The surface of the tumor presented erosions and ulcers. The cut surface had a gray-red color revealing lobules. On microscopic examination the tumor was composed of hyperplasia of Brunner's glands. The hyperplastic glands formed lobules and ducts embedded in a fibrous stroma, adipose tissue, and aggregated lymphoid. No signs of malignancy were found and the tumor was completely surrounded by duodenal mucosa. The final histological diagnosis was assessed as Brunner's gland adenoma of the duodenum. During the six month follow-up, the patient remained symptom-free with resolution of the anemia. Endoscopy did not find any residual lesion.

Discussion

In 1688 Brunner gave a precise anatomic description of the duodenal submucosal glands and used the term pancreas secundarium. In 1846 Middeldorpf correctly identified these glands as a separate entity from duodenal glands but structurally and functionally similar to glands of pylorus, and proposed be named "Brunner's glands". Brunner's glands are mucin-secreting glands located in the deep mucosa and submucosa of duodenum, secreting an alkaline fluid composed of viscous mucin, pepsinogen and enterogastrone, whose function appears to protect the duodenal epithelium from acid of the stomach^{4,6-9}. They extend from pylorus distally for a variable distance, usually up to the second portion of the duodenum. In infant Brunner's glands occupies 55% of total duodenal area; by 50 years of age, this drops to 35%¹⁵.

In 1835 Curveilheir described the first Brunner's gland adenoma¹³.

Benign tumors of the duodenum are rare. Adenomas are the most common duodenal tumors including adenomatous polyps and Brunner adenoma. They are reported in 0,008% of the patient in a single series of 215000

autopsies and Brunner's gland adenoma comprises 10,6% of these lesions¹⁷⁻²⁰. Size of the tumor is important in differentiating adenoma from Brunner gland hyperplasia. The size less than 1 cm is referred to as Brunner gland hyperplasia^{3-5,14,16}.

Aetiology and pathogenesis of Brunner's gland adenoma still remains elusive, but associations with peptic ulcer disease, chronic pancreatitis and chronic renal insufficiency have been described^{5,6}. Brunner's gland hyperplasia is believed to act as a mechanism which allow to protect the duodenal mucosa^{14,17}. Given that Brunner's glands have an anti-acid function, it has been postulated that gastric hyperacidity could stimulated these structures to undergo hyperplasia, but only 45% of patients had hyperacidity and 20% had hypoacidity^{6,20-22}. Franzin²³ et al have reported an association between Brunner's gland adenoma and gastric hyperacidity in patients with chronic gastric erosions and duodenal ulcers. Nevertheless Spellberg et al²⁴ have not found regression of the lesion with acid secretion inhibitors. Other mechanism suggested is inflammatory origin due to the presence of a dense inflammatory cell infiltration, but given that lymphocytes are usually present in the normal submucosa, the presence of inflammatory cell in the Brunner's gland adenoma is not sufficient to sustain this inflammatory theory^{14,21,25}. Finally, it has suggested that *Helicobacter pylori* infection may play a role in the pathogenesis of Brunner's gland adenoma, but its role remains unclear^{26,27}. In our opinion, on the whole of lobules of Brunner's glands separated by fibrovascular septa embedded in a fibrous stroma with adipose tissue and lymphocyte and monocyte infiltration, suggests to identify this lesion as a hamartoma or nodular hyperplasia rather than a real neoplasm. Although the malignant degeneration is rare, two cases has been reported, including one patient with microcarcinoid tumors^{8,28}. Fujimaki¹⁰ et al reported one patient with a focus atypical gland and p-53 positive cells detected sporadically and conclude that the apycal glands probably represented a neoplastic lesion.

The most common location for the Brunner's gland adenoma is the posterior wall of the duodenal bulb (57%)²⁹. In the majority of cases, this lesion present into a polypoid mass usually peduncolated (88%)²⁰. Brunner's gland adenoma was rarely found extending to the proximal jejunum^{8,21}. Laarman et al³⁰ reported a Brunner's gland adenoma located in the proximal jejunum; Hanken and Forouhar³¹ describe a patient with a Brunner's gland adenoma situated in the proximal ileum. In our patient, Brunner's gland adenoma are located in the second part of the duodenum (posterior and medial wall).

Feyrter³² classied three types of Brunner's gland hyperplasia: diffuse nodular hyperplasia (Type I) confined to the mucosa with multiple sessile projections occupying most of the duodenum; circumscript nodular hyperplasia (Type II) the most common type mainly present in the duodenal bulb, usually less than 1 cm in size; adenomatous hyper-



Fig. 1: Ultrasonography show a hyperechoic endoluminal mass in the first and second portion of the duodenum.

plasia (Type III), also known as Brunner's gland hamartoma or adenoma or Brunneroma, which generally present as a single polypoid lesion, sessile or pedunculated^{6,14}. Hyperplasia refers to multiple lesions (usually less than 1 cm) and adenoma refers to a lesion larger than 1 cm³³. Brunner's gland adenoma has a tendency to be predominant in the fifth or sixth decade of life with equal gender distribution^{21,34}. Symptoms of the patients with Brunner's gland adenoma can be inserted into two categories: symptomatic tumors that can further be divided into haemorrhagic and obstructive tumors; and asymptomatic tumors that are only found incidentally^{8,17}. The most common clinical manifestations of symptomatic group are gastrointestinal hemorrhage, due to ulceration or erosion of the tumor. Obstructive tumors causing epigastric bloating, discomfort, vomiting or weight loss^{6,25}. There are also reports about patients who complained of diarrhoea owing to disturbances of duodenal motility²⁴. Levine²¹ et al studied the characteristics of

a group of 27 patients with Brunner's gland adenoma and described three types of clinical picture. An asymptomatic group comprising 11% in whom the Brunner's gland adenoma was an incidental finding. The second group (40-50%) consisted of patients with upper gastrointestinal bleeding. These patients with bleeding complications present with melaena, fatigue, malaise and anaemia³⁵. Although blood loss usually occult, massive and even fatal haemorrhage has been described³⁶. The last group comprised patients with prolonged obstructive upper gastrointestinal symptoms. These obstructive symptoms is present in about 50% of patients, giving rise to epigastric pain, nausea, vomiting and postprandial discomfort. Duodenal intussusception, pancreatitis and diarrhoea are rare presentations^{14,25}. Our patient presented initially with severe anemia and later on vague epigastric discomfort but no obstructive symptoms although the lesion was too large.

Preoperative histological diagnosis of Brunner's gland adenoma is not always easy at present. Diagnostic radiographic studies include especially ultrasonography, barium contrast studies and endoscopy (37). Large adenomas may be detected by ultrasonography (Fig. 1)³⁸. Upper gastrointestinal barium studies may reveal multiple small filling defect (Swiss cheese appearance) in Brunner's gland hyperplasia or, in the case of an adenoma, a smooth polypoid defect may be seen. Hypotonic duodenography may have a role for delineating the surface of the lesion⁴⁰. In X-rays barium examination, the findings are often non-specific because there is usually a sessile or pedunculated polypoid-filling defect in the duodenal bulb^{8,37}. Upper gastrointestinal endoscopy with biopsies is the diagnostic method of choice (Fig. 2)^{25,31}. She has an additional function in diagnosing and treating Brunner's gland adenoma, since than is possible to verify the histological diagnosis and remove the tumor at the same time. Endoscopic pinching biopsies is usually negative since the biopsy forceps are unable to reach the tumoral tissue localized completely in the submucosa layer (Fig. 2c)³⁹. Computed tomography is useful only to confirm the absence of extraluminal extension of Brunner's gland adenoma^{41,42}. In our case, first the

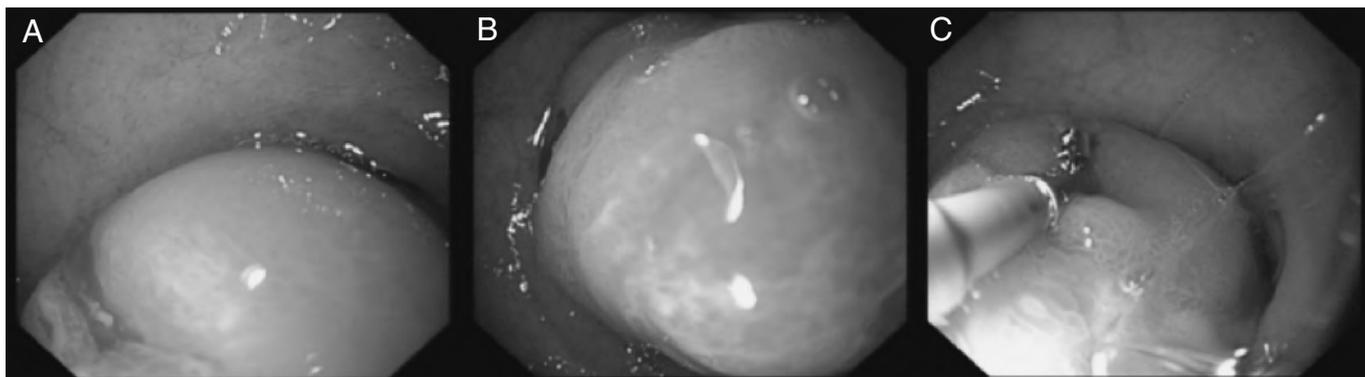


Fig. 2: Large polyp with a short peduncle completely occupying the bulb and second part of the duodenal lumen (a, b). Multiple biopsy (c).

tumor was detected by ultrasonography and than confirmed by endoscopic examination; biopsies, however, showed normal tissue and the final diagnosis was made with pathological examination.

Brunner's adenoma can mimic several other lesions; the differential diagnosis includes benign tumours of the small intestine such as adenoma of the Islet cells, polypoid adenoma, leiomyoma, lipoma, angioma, aberrant pancreatic tissue, prolapsed mucosa, duodenal duplication cyst and malignant tumours as adenocarcinoma, lymphoma, carcinoids tumour and leiomyosarcoma^{14,43,44}.

Brunner's gland adenomas are considered a benign disorder; malignant degeneration has only been described twice in literature^{10,28}. It is still controversial whether asymptomatic Brunner's gland adenoma found incidentally needs surgical treatment. Some people think that it needs no treatment, whereas for others, and for us too, endoscopic or surgical removal is suggested to prevent the development of complications (haemorrhage, severe anaemia, obstruction)^{20,21}. Symptomatic Brunner's gland adenoma can be removed endoscopically or with transduodenal exploration and excision of the polyp by laparoscopic or open surgery^{6,14,45}. Endoscopic polypectomy represents the ideal approach when the tumour is pedunculated and still relatively small^{5,17}. However, the success depends by an experienced surgeon. Open surgical excision with transduodenal exploration, excision of the polyp and suture of duodenotomy, is reserved for cases where endoscopic treatment has failed or, like our, when tumour is too large^{17,41}.

In our case, because of site and size of the lesion (5,8 cm x 4,8 cm) with a very short peduncle occupying entirely the duodenal bulb, surgical removal was effective for the treatment of Brunner's gland adenoma without complications and completely resolution of the anemia. Moreover endoscopy did not find any residual lesion or recurrence during six month follow-up.

Conclusion

Brunner's gland adenoma is a rare benign tumour of the duodenum and itself is a very rare and insidious cause of upper gastrointestinal bleed. Patients may also present with symptoms of obstruction. Endoscopic polypectomy is the first choice when the tumour is small or pedunculated. Surgical excision is reserved for cases where endoscopic treatment has failed or when tumour is too large.

Riassunto

L'adenoma delle ghiandole di Brunner è un raro tumore benigno del duodeno. La sua più frequente localizzazione è a livello della parete posteriore tra prima e secon-

da porzione duodenale. Generalmente piccolo ed asintomatico quando viene scoperto accidentalmente in corso di esame endoscopico, a volte può essere di grandi dimensioni e causare sintomi emorragici od ostruttivi. Gli Autori riportano il caso clinico di un adenoma di Brunner di grandi dimensioni in una donna di 38 anni presentatosi con un quadro di anemia severa ma senza sintomi ostruttivi e scoperto mediante indagine ecografica. Il tumore è stato asportato chirurgicamente e la paziente a sei mesi di follow-up è risultata in buona salute, libera da malattia e con completa risoluzione del quadro anemico. È stata inoltre eseguita una revisione della più recente letteratura.

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