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Case Report

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Brunner Gland Cyst: Two Cases of a Rare Entity and Review of the Literature

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ABSTRACT

Objective: Brunner gland cysts are rare with only 14 cases reported in the literature. The term has been used to consolidate the following entities: Brunner's gland cyst, cystic Brunner's gland hamartoma, Brunner's gland cystadenoma and mucocele of the Brunner gland.
Methods: We present the clinico-pathological features of two cases of Brunner gland cyst along with a review of the literature.
Results: Brunner gland cyst affects slightly more men than women. The age range is 30 to 72 years with an average of 55 years. The lesions range from 1 to 5 cm in size, the average being 2.3 cm in greatest dimension. The majority of lesions are found incidentally in patients with symptoms not specifically related to the lesion. They affect predominantly the first and second portion of duodenum. The majority of the lesions are single and pedunculated filling the submucosa. They can be unilocular or contain multiple cysts divided by fine septae. The epithelial lining is of columnar and clear cells with basally located nuclei.
Conclusion: Brunner gland cysts are benign lesions that are usually not diagnosed pre-operatively. The cases described here add awareness of this entity among pathologists and gastroenterologists allowing for a better recognition of this rare entity.

KEY WORDS: Duodenum; Brunner gland; Cystadenoma; Cyst; Hamartoma.

INTRODUCTION

Cystic lesions of the Brunner gland are rare. They have been referred to as Brunner's gland cyst, cystic Brunner's gland hamartoma, Brunner's gland cystadenoma and mucocele of the Brunner gland. Recently these entities have been grouped under the term Brunner gland cyst. Even with these combined entities, there are only fourteen Brunner gland cysts reported in the English literature. We present two new cases of Brunner gland cyst and compared them to those previously reported. Their clinical presentation and similarities are summarized.

CASE PRESENTATIONS

A 69-year-old Hispanic male was referred by his primary care physician to our institution for further studies of a duodenal lesion that was discovered after a workup for acid reflux. Endoscopic ultrasound showed a 17x6 mm septated cyst that appeared to arise from the submucosa of the second portion of the duodenum (Figures 1 and 2). No other abnormalities were noted. The cyst was resected after lifting the lesion with saline and methylene blue.

The specimen consisted of an ovoid lesion with a 0.5 cm cystic cavity. Microscopic examination revealed a submucosal multicystic lesion lined by tall, columnar cells with round basally located nuclei (Figures 3 and 4). Most of the cells had abundant clear cytoplasm similar

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to those seen in the adjacent normal Brunner glands. In other areas, the lining cells were smaller with pink cytoplasm. The cysts were filled with a serous-like fluid. Necrosis, mitotic activity, and nuclear atypia were absent. The cells contained neutral, Periodic Acid Schiff (PAS) positive mucin, similar to the adjacent Brunner's glands

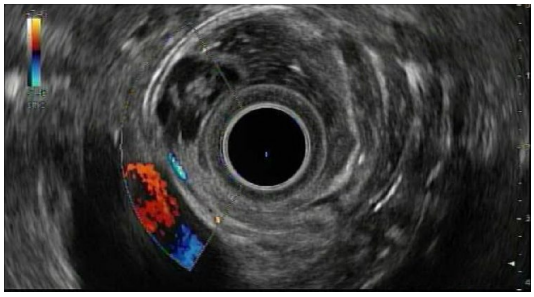

Figure 1: Radial EUS (7.5 MHz) of cystic duodenal Brunner gland cyst. Anechoic lesion in the deep mucosa/submucosa.

Figure 2: Endoscopic image of lobulated lesion in the second portion of the duodenum.

The second patient is a 52-year-old Caucasian man referred to our institution because of epigastric pain and a duodenal mass found at endoscopy. Another endoscopy was performed along with endosonography. An intramural (subepithelial) lesion was found in the second portion of the duodenum. The lesion appeared to originate from within the submucosa (layer 3). The possibilities of pancreatic rest or Brunner's gland hyperplasia were considered. The lesion was hypoechoic, heterogeneous and multicystic that measured 14.5 mm x 10.9 mm. The outer margins were well defined. An intact interface was seen between the mass and the adjacent structures suggesting a lack of invasion. An endomucosal resection of the mass was performed.

Histologically, the multicystic lesion was located in the submucosa of the duodenum and was composed of tall cells with basally located round nuclei. The cytoplasm was clear and abundant. In areas, there were aggregates of glands by the single row of epithelial cells lining the cysts creating a nodular configuration. No mitosis, necrosis or atypia was observed.

DISCUSSION

Rankin, et al. reported the first cystadenoma of the duodenum in 1933.[1] Varnholt, et al. were the first to group Brunner gland cyst, Brunner cyst, mucocele of Brunner gland, and cystic Brunner's gland hamartoma as one entity.[2] Later, Powers, et al. added Brunner gland cystadenoma to this group.[3] There are fourteen cases reported in the English literature.[1-12] Information from these cases and the current two is summarized in Table 1.

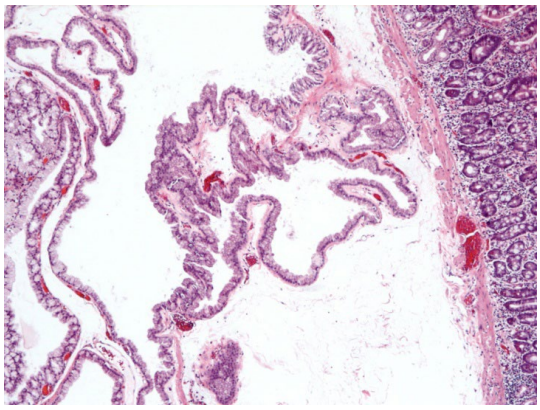

Figure 3: Brunner gland cyst of the duodenum demonstrating multiple small cysts lined by fibrous septa (H&E, 100x).

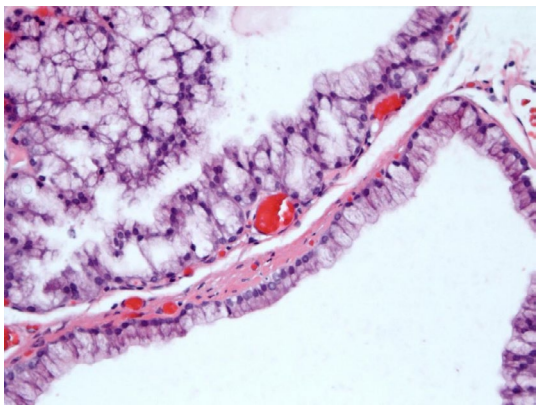

Figure 4: Brunner gland cyst of the duodenum lined by tall, columnar cells with round basally located nuclei (H&E, 400x).

Brunner gland cysts are benign, as evidenced by the fact that the lesion described by Golan, et al. was present for 15 years without any long-term consequences.[9] They are widely believed to be retention cysts that develop after obstruction of a larger duct of the Brunner gland outflow tract.[2]

Based on this case and the well-described fourteen previously reported cases, the following conclusions can be made. The lesion can occur throughout the duodenum, specifically any place that contains Brunner glands. The large majority are single lesions with one patient reported to have two.[3] Most of the lesions are pedunculated and located in the submucosa, but sessile lesions have been reported and one was transmural.[8] While some are unilocular, others contain multiple cysts divided by fine septae. The cysts are lined by mucinous, columnar cells with basally located nuclei, resembling normal Brunner gland cells. Eosinophilic cells lining the cyst wall are also common. Only the case described by Chatelain, et al. showed ciliated columnar cells.[7] Atypia is rare, and mitosis is only reported in one case.[10]

Year	Authors	Diagnosis	Age, Sex	Clinical presentation	Location	Size (cm)	Architecture	Depth	# of cysts	Histology characteristics
2015	Moul, et al. (current case)	Brunner gland cyst	69, M	Incidental finding in a patient with acid reflux	Second portion of duodenum	1.7 x 0.7 x 0.3	Sessile	Sub-mucosa	Single	Focal eosinophilic cells
2015	Moul, et al. (current case)	Brunner gland cyst	52, M	Epigastric pain	Second portion of duodenum	1.4 X 1.0	Polypoid	Sub-mucosa	Single	Focal eosinophilic cells
2011	Galiatsatos[4]	Brunner gland cyst	72, M	Incidental	Distal end of the second part of the duodenum	2	Polypoid	Not specified	Not specified	Normal appearing duodenal mucosa and dilated lymphatic channels and capillaries (pictures not available for review)
2009	Park, et al.[5]	Cystic Brunner's gland hamartoma	30, M	Three-day history of nausea, vomiting, and epigastric pain.	Third portion of the duodenum	4 x 3	Pedunculated	Sub-mucosa	Multiple	Lobular collection of mature Brunner's glands, multifocal cystic dilation.
2008	Powers, et al.[3]	Brunner gland cyst	46, F	Dyspepsia and odynophagia	Two lesions located in the second part of the duodenum	1.8 and 2.2	Sessile	Sub-mucosa	Single	Cystic spaces lined by hyperplastic cells similar to Brunner glands cells.
2008	Powers, et al.[3]	Brunner gland cyst	67, F	Incidental in a patient with unexplained iron-deficiency anemia	Second part of the duodenum	1.5	Sessile	Sub-mucosa	Single	Cystic spaces lined by hyperplastic cells similar to Brunner glands cells.
2008	Powers, et al.[3]	Brunner gland cyst	59, F	Incidental in a patient with abdominal pain, heartburn, steatorrhea	Duodenal bulb (first portion)	1.0	Nodule	Sub-mucosa	Single	Cystic spaces lined by hyperplastic cells similar to Brunner glands cells.
2007	Varnholt, et al.[2]	Brunner gland cyst	41, F	Incidental finding in a women being treated for H. pylori-associated gastritis.	Not specified	1.1 x 0.9 x 0.6	Sessile	Sub-mucosa	Single	Cyst lined by a simple cuboidal-to-columnar epithelium.
2003	Yamakawa, et al.[6]	Cystic Brunner's gland hamartoma	64, F	Epigastric pain	Descending duodenum (second portion)	2.4 x 1.1 x .5	Pedunculated	Sub-mucosa	Multiple	Multilocular cysts lined by columnar epithelium ; dilated ductal structures.
2002	Chatelain, et al.[7]	Brunner gland hamartoma with predominant adipose tissue and ciliated cysts	43, M	Two-day history of regurgitation.	Duodenal bulb (first portion)	3.5	Pedunculated	Sub-mucosa	Multiple, ciliated	Prominent mature adipose tissue, hyperplastic lobules of Brunner glands
1980	Fisher[8]	Mucocele of Brunner gland	45, F	Right upper quadrant pain intermittently for two months	Not specified	Not specified	Not specified	Sub-mucosa	Single	Intact duodenal mucosa with prominently dilated glandular spaces, one being large and cystic.
1978	Golan J, et al.[9]	Cystic Brunner's gland hamartoma	64, M	Acute gastrointestinal bleeding; had a known duodenal polyp for 15 years	First part of the duodenum.	5 x 4 x 2	Pedunculated	Sub-mucosa	Multiple	Cysts were lined by columnar and cuboidal epithelium. The surface epithelium was partly pyloric and partly duodenal.

	Taura M, et al.[10]	Brunner's cyst	54, F	Nausea, vomiting, and epigastric pain for several days	Duodenal bulb (first portion)	1.5	Not specified	Sub-mucosa	Single	Lined by tall columnar cells with basal nuclei. Multinucleated cells were intermingled with the epithelial lining cells.
	Wolk DP, et al.[11]	Brunner's gland cystadenoma	68, M	Presented with 20 lb weight loss and eructation.	Third portion of the duodenum, located on the posterior wall	3 x 3	Not specified	Sub-mucosa	Multiple	Multiple fluid-filled cystic spaces confined to the submucosa, lined by Brunner glands
	Hately[12]	Brunner's gland cyst	54, M	Two year history of intermittent vomiting, now after every meal.	First part of the duodenum.	1.5	Sessile	Sub-mucosa	Single	Cyst lined by columnar epithelium and had a direct origin from one of the Brunner glands.
	Rankin and Newell[1]	Simple, multilocular cystadenoma	54, M	18 m history of pernicious anemia and ulcer-like dyspepsia.	-	2	Not specified	Sub-mucosa	Multiple	Cyst lined by cuboidal epithelial cells.

Table 1: Brunner gland cysts reported in the English literature: Patient characteristics, clinical presentation, diagnostic modality and lesion location, and histological characteristics.

Ultrastructural studies performed by Taura, et al. in 1977 demonstrated epithelial cells containing membrane-bound secretory granules in the cytoplasm, mainly in the apical region, and a well-developed Golgi apparatus. The luminal surfaces contained microvilli. These features suggested that the cells of Brunner gland cysts were functionally more active than normal Brunner gland cells. Another distinct histological feature was the lack of neuroendocrine cells within the Brunner gland cysts, which is not true of normal Brunner's glands.[10]

There is no sex predilection; fifty-three percent were male. The age range was 30 to 72 years of age, with the average being 55 years. The lesions ranged from 1 to 5 cm in size, the average being 2.3 cm in greatest dimension. While increased size correlated with more clinical symptoms, the patient with the largest reported lesion was not symptomatic from the lesion but from an adjacent ulcer.[9] Nonetheless, most clinical symptoms are regurgitation, vomiting, and epigastric pain. However, it may be discovered incidentally for unrelated symptoms. Most often, the lesions are located in either the first or second portion of the duodenum. This corresponds to the most common locations of the Brunner's gland, which are mostly concentrated in the first portion and gradually decrease in number throughout the length of the duodenum.[13]

The differential diagnosis on endoscopic imaging includes duplication cysts, lipomas, neuroendocrine tumors and Brunner gland hamartomas. Using endoscopic ultrasound it is possible to differentiate the echostructure (cystic, solid, hypo- or hyperechoic) and wall layer of involvement. The differential diagnosis of hypoechoic/anechoic duodenal lesions would be mainly duplication cysts, stromal cell tumors and neuroendocrine tumors. Our first patient underwent resection to ensure his was not a cystic neuroendocrine lesion. Histologically the main differential diagnosis is Brunner's gland hamartoma, formerly known as Brunner's gland adenoma. These lesions are admixtures of Brunner's glands, ducts, adipose tissue and lymphoid tissue. While their ducts may be dilated, cystic lesions are not characteristic of this entity.[14]

Brunner gland cysts are rare benign lesions of the duodenum. The treatment is surgical excision or polypectomy. Increased awareness of these lesions helps for a better recognition of this entity.

CONFLICTS OF INTEREST: None.

DISCLOSURES

No consent is required to our article publication referenced above.

REFERENCES

1. Rankin FW, Newell CE. Benign tumors of the small intestine. *Surg Gynec Obstet*. 1933; 57: 501-507.

2. Varnholt H, Gang DL, Desilets DJ, et al. Brunner gland cyst. *Int J Surg Pathol*. 2007; 15: 64-65.

3. Powers M, Sayuk GS, Wang HL. Brunner gland cyst: report of three cases. *Int J Clin Exp Pathol*. 2008; 1: 536-538.

4. Galiatsatos P. A case of mistaken lipoma. Diagnosis: Brunner gland cyst. *Gastroenterology*. 2011; 141 (4): 1159-1160. doi: 10.1053/j.gastro.2010.07.054

5. Park BJ, Kim MJ, Lee JH, et al. Cystic Brunner's gland hamartoma in the duodenum: A case report. *World J Gastroenterol.* 2009; 15: 4980-4983. doi: 10.3748/wjg.15.4980

ISSN 2377-8369 Open Journal http://dx.doi.org/10.17140/GOJ-1-113

6. Yamakawa M, Murata I, Yamao T, et al. Cystic Brunner's gland hamartoma. *Gastrointest Endosc*. 2003; 57: 919.

7. Chatelain D, Maillet E, Boyer L, et al. Brunner gland hamartoma with predominant adipose tissue and ciliated cysts. *Arch Pathol Lab Med*. 2002; 126: 734-735.

8. Fisher JK. Mucocele of a Brunner gland. *Radiology*. 1980; 136: 320. doi: 10.1148/radiology.136.2.7403503

9. Golan J, Dollberg L, Dollberg M, et al. Cystic hamartoma of Brunner's glands. *Int Surg*. 1978; 63: 173-175.

10. Taura M, Taura S, Kummerow FA, et al. An ultrastructural study of the Brunner's cyst. *Gastroenterol Jpn*. 1977; 12: 241-244. doi: 10.1007/BF02781769

11. Wolk DP, Knapper WH, Farr GH. Brunner's gland cystadenoma of the duodenum. *Am J Surg*. 1973; 126: 439-440. doi: 10.1016/S0002-9610(73)80141-2

12. Hately W. Cyst of Brunner's glands. *Br J Radiol*. 1968; 41: 384-385.

13. Katzin WE, Petras RE. Small Intestine. In: Mills SE, ed. Histology for pathologists, 4th edn. Philadelphia, PA: Lippincott Williams & Wilkins; 2012: 657-659.

14. Levine JA, Burgart LJ, Batts KP, et al. Brunner's gland hamartomas: clinical presentation and pathological features of 27 cases. *Am J Gastroenterol*. 1995; 90: 290-294.