ADENOMA OF BRUNNER'S GLANDS

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ADENOMA of Brunner's glands is rare, since less than 100 cases have been described. It is unusual for a surgeon to treat more than 1 patient suffering from this condition and this present article is an attempt to summarize the present situation.

Brunner in 1688 (Grossmann, 1958) described the glands which have been named after him, but

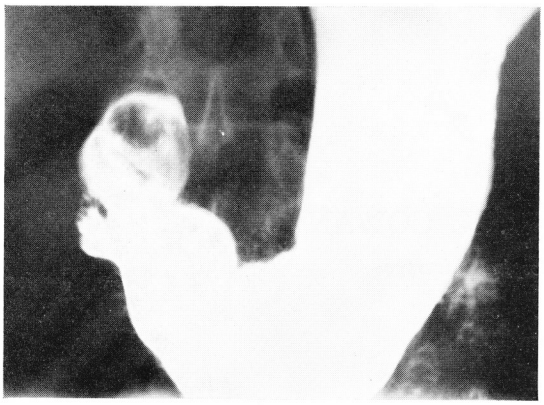

FIG. 1.—Barium-meal examination. A solitary vacuolated filling defect in the first part of the duodenum.

Cruveilhier (1835) and Rokitansky (1861) were the first morbid anatomists to describe adenomata arising from these glands. The adenoma which Salvioli recorded in 1876 was probably a fibro-adenoma. Feyrter (1934) in a classic article discussed the pathology of 36 cases of hyperplasia, of which 3 were adenomata. The history to 1935 was reviewed by Sworn and Menton (1935) in a comprehensive paper.

Jacobius (1940) described the eighteenth case and Wilensky (1948) the forty-seventh. By 1952, 65 cases had been reported (Hudson and Ingram, 1952). Moffat and Anderson (1955) added 1 case and within one year Deren and Henry (1956) made the total 71. Then Cajelli (1956) and Barry, Otis, and Thau (1958) both competed in claiming to describe the seventy-second case. Stephens and Harbrecht (1958) added a further case to make their calculated total 73. The latest additions have been by Holt and Kennard (1962), who thought that approximately 80 had been described in the literature, and by Ponka and Shaalen (1964), who claimed the eighty-fourth case.

CASE REPORT

Mr. H. H., aged 65 years, was first seen in December, 1964, with a history of pain and flatulence since September, 1964. The pain was situated in the right hypochondrium and had been present each day of the preceding 4 months. It commenced with a sharp attack each morning and then persisted as a soreness throughout the day. Physical examination revealed only tenderness in the right hypochondrium and an incidental blood-pressure of 190/110 mm. Hg. A Graham's radiograph was negative, but a barium-meal examination revealed a solitary vacuolated filling defect in the first part of the duodenum (*Fig.* 1). In January, 1965, a laparotomy was performed and an intraluminar polypoid mass the size of a small plum was felt in the first part of the duodenum, which was removed from the posterior wall through a 3-inch longitudinal incision, which was closed transversely.

The polypoid mass was about 1·5 cm. in diameter and was covered by an intact duodenal mucosa. The histological appearances were those of an adenoma of Brunner's glands (*Figs.* 2, 3). In May, 1965, the patient had minimal symptoms of flatulence and when he was last seen in July, 1965, there were no symptoms of dyspepsia, but he complained of pain at the lower end of the scar which was so similar to his original trouble that he thought that this was caused by another tumour. He was, however, reassured that this was unlikely to be so.

PATHOLOGY

Feyrter's classic paper in 1934 must be the starting point of any consideration of the pathology of Brunner's glands. He divided hyperplasia of the glands into three types and this grading remains as the working classification quoted by most authors who have studied any series of Brunner's gland lesions.

I. *Hyperplasia diffusa et nodosa glandularum duodeni*: Folds and nodules are found diffusely throughout the duodenum.

II. *Hyperplasia nodularis circumscripta glandularum duodeni*: Nodules are isolated and are found especially in the proximal duodenum. There is atrophy of the adjacent glands.

III. *Adenoma glandularum duodeni*: Single tumour-like nodules.

Robertson (1941), in a full article embracing the anatomy, physiology, and pathology of Brunner's glands, accepts Feyrter's grading but does not consider the problem of possible transition between the three types. Cattell and Pyrtek (1949) thought that there might indeed be a transition from chronic inflammation through hyperplasia to adenoma. Possibly due to the small amount of material available to any one observer, the issue remains unresolved. Certainly most of the lesions appear histologically classifiable into one of Feyrter's groups and transitional or equivocal examples are not described in the manner that one might expect if the groups in fact represented stages of a continuous process.

The aetiology of these lesions is uncertain, although Feyrter (1934) noted the frequency of hyperplasia

associated with severe renal damage and Goldman (1963) discussed the causal relationship with duodenal ulceration.

Adenomata were originally described as varying in size from a pea to a hazel-nut (Feyrter, 1934). The present patient had a polyp approximately 1·5 cm. in diameter. Hudson and Ingram (1952) found them to be usually less than 1·0 cm. in diameter, but Stephens and Harbrecht (1958) said they varied from 0·2 to 6·0 cm. in diameter. Silverman, Waugh, Huizenga, and Harrison (1961) described one 6·0 × 2·4 cm. in diameter, but the largest, 8·5 × 7·5 × 3·0 cm., has been claimed by Deutschberger, Tchertkoff, Daino, and Vieira (1962) in a comprehensive article. There is general agreement that they are not to be found below the level of the ampulla of Vater (Deren and Henry, 1956) and they appear most frequently in the first part of the duodenum.

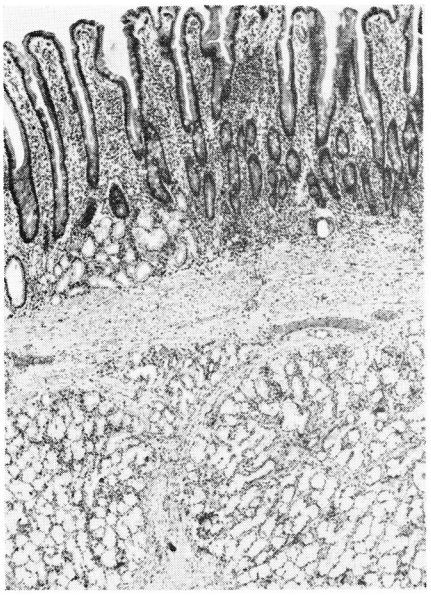

FIG. 2.—Normal duodenal mucosa with a lobulated adenoma of Brunner's glands beneath the muscularis mucosae. H. and E. (×48.)

McQuitty and Levy (1959) in a review of the literature found the age incidence to be between 20 and 90 years, but 90 per cent were older than 40.

It is important to assess the danger of malignant change because this would alter treatment. Carcinoma of the duodenum is itself rare, and in 1962 Barclay and Kent wrote that only about 550 authentic cases of adenocarcinoma of the duodenum had been described since the first case in 1746 by Hamberger in his book *De Ruptura Intestini Duodeni*. Hudson and Ingram (1952) stated that because of the rarity of adenomata of Brunner's gland statistics as to potential malignancy are unavailable. Christie (1953) described an instance of carcinoma of the duodenum apparently originating in part from Brunner's glands; one other example is recorded by Evans (1956). Malignant change unquestionably occurring in an established adenoma has not, however, been recorded and it seems likely that Cattell and Pyrtek (1949) and Stewart and Lieber (1937) are correct in believing that few, if any, adenomata undergo such change.

DISCUSSION

The historical review suggests that this is a very rare condition. Moffat and Anderson (1955) quote Raiford as having discovered hyperplasia in 0·16 per cent of 59,000 autopsies. Hoffman and Grayzel (1945) estimated the incidence of adenoma of Brunner's glands at 10·6 per cent and adenoma of mucosal glands at 31·8 per cent in studying 66 cases of benign duodenal tumours. River, Silverstein, and Tope (1956), in a monumental review of 1339 cases of benign neoplasia of the small intestine, discovered 227 adenomata which were more common in the duodenum rather than in the jejunum or ileum, but they did not specifically mention adenoma of Brunner's glands.

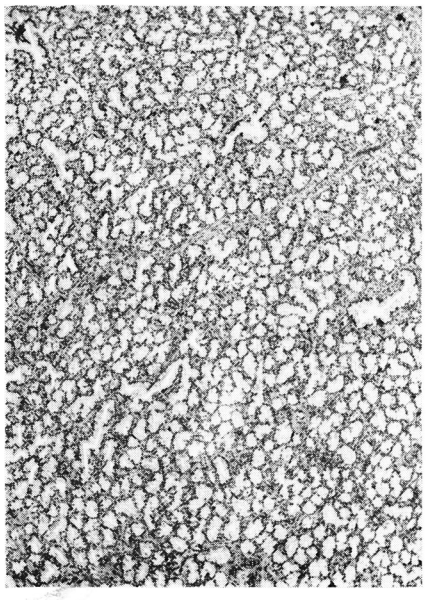

FIG. 3.—General appearance of the adenoma consisting of richly branched and coiled tubules and an occasional duct. The glandular cells of the adenoma gave a strong diastase-fast P.A.S. reaction, unlike the goblet cells of the mucosa, and failed to react with alcian blue, showing that the mucopolysaccharides of the acini of the adenoma differ from those of the mucosal goblet cells. The epithelium of the dilated ducts within the adenoma, however, reacted moderately well with alcian blue. H. and E. (×48.)

A large number of Feyrter's Type I and II hyperplasias probably produce few symptoms and are found incidentally at post-mortem. Adenomata may cause no symptoms at all or they may cause dyspepsia severe enough for the patient to be subjected to a barium-meal examination. These patients may have ulcer-like distress, vague epigastric pain, and fullness or substernal belching of gas (Hudson and Ingram, 1952; Warren, 1952; Stephens and Harbrecht, 1958). Haemorrhage leading to melaena may occur when the adenoma ulcerates (Wilensky, 1948). Ponka and Shaalen (1964) describe obstruction due to obturation. Intussusception should be a singular event because the duodenum is fixed posteriorly, but it has been described by Kellogg

(1931), who also quoted 10 previous cases of intussusception in the duodenum.

Although the patient now presented had localized tenderness, there are usually no physical signs.

The radiographic appearances are of a solitary vacuolated filling defect in the first or second part of the duodenum, proximal to the ampulla of Vater, suggesting a pedunculated polyp (Warren, 1952) produced by an adenoma or Feyrter's Type III hyperplasia. Dodd, Fishler, and Park (1953) quote Golden (1928) as the first radiologist to describe this. A 'cobblestone' or 'Swiss-cheese' appearance occurs in the nodular hyperplastic type of lesion—Feyrter Type II. No radiographic changes typical of Feyrter's Type I have been described.

By far the most common cause for a solitary filling defect in the first part of the duodenum is an adenoma of Brunner's glands. Adenomata of mucosal glands probably occur next most frequently. Other benign tumours that have been described include a fibroadenoma, myoma, haemangioma, lipoma, Schwannoma, neuroma, and argentaffinoma. Carcinoma of the duodenum is rare and does not usually present as a solitary filling defect (Barclay and Kent, 1956, 1962).

The radiological differential diagnosis has included the following conditions (Healy and Connor, 1959; Tobik, 1964):—

1. Prolapse of pyloric mucosa.
2. Antral gastric polyp.
3. Preduodenal portal vein.
4. 'Lymphogranulomatosis abdominalis.'
5. Aberrant pancreatic tissue.
6. Mucosal oedema secondary to an ulcer.
7. Retained food or bezoar.
8. Idiopathic haematoma.

No one surgeon will ever gain a sufficient experience to decide as to the best treatment for a patient if an adenoma is discovered at laparotomy. The extent of the removal of tissue will depend on whether there is a concomitant lesion such as a duodenal ulcer and whether malignancy is considered to be a complication. Frozen-section histological studies should be performed if possible and all polypoid lesions should be treated surgically (Warren, 1952). Ponka and Shaalen (1964) performed a Hofmeister partial gastrectomy for their first patient and a duodenotomy with polypectomy for their second. Charles, Kelly, and Campeti (1963), when discussing benign duodenal tumours, were not optimistic over the success of operations in regard to symptoms and said that they were not necessarily improved. They deduced that cause and effect were not clearly defined, but the patient described here appears to have lost his original symptoms. Probably simple removal of the polyp is the best method of treatment.

SUMMARY

A case report of an adenoma of Brunner's glands is presented which corresponds to Feyrter's Type III. The symptoms and signs are of a vague non-specific nature simulating those of a gastro-intestinal or a gall-bladder origin. The preoperative diagnosis rests on discovering a solitary vacuolated filling defect in the first part of the duodenum, suggesting a polyp. The treatment must always be surgical, and the simplest method is by duodenotomy and polypectomy because the risk of malignant change is almost negligible.

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