Hyperplasia of Brunner's glands

J. F. STOKES, L. A. TURNBERG, AND J. C. HAWKSLEY

From University College Hospital, London

EDITORIAL SYNOPSIS The function of Brunner's glands in the duodenum has never been adequately defined and it is therefore particularly necessary to bring together any evidence which might relate to clinical syndromes. This paper records three patients with upper abdominal symptoms and apparent hyperplasia of these glands.

Brunner's glands are rarely the seat of pathological change. Cases of solitary adenoma arising in the glands are reported (Jacobi, 1940; Cattell and Pyrttek, 1949; Culver and Caccese, 1957; Stephens and Harbrecht, 1958) and carcinoma has been noted on one occasion (Christie, 1953). In addition, it is known that diffuse hyperplasia, producing lobulated masses of glands, may occur; it is difficult to regard this change as a primary tumour of the glands and it seems more probable that it is a true hyperplasia in response to an increased stimulus of some sort. The diagnosis of hyperplasia is only made after barium meal (Dobek, 1961) and the significance of the characteristic radiological appearances is still debated. Feldman and Feldman (1958) note that, in many cases, the pathological changes are only discovered at operation or at necropsy in patients for whose vague abdominal symptoms no other satisfactory cause has been established.

Three instances of young men with upper ab-

dominal symptoms, in whose cases the typical radiological changes of hyperplasia of Brunner's glands have been observed, are reported.

CASE 1 T.B., a 28-year-old male clerical worker, gave a history of constant vague discomfort in the upper abdomen for nine years and for three years he had had recurrent episodes of more severe pain every three or four months. Lasting about four days at a time, each exacerbation was unrelated to food and unrelieved by alkalis. He had rarely vomited, had no bowel upset, nor had he lost weight. The family history was interesting in that his mother, two maternal uncles, and two maternal aunts were said to suffer from 'nervous dyspepsia' but none had required hospital investigation.

Physical examination revealed no abnormality in any system. Investigation showed a normal blood picture, stools were negative for occult blood, and an augmented histamine test meal (Kay test) showed normal acid secretion. A barium meal (Fig. 1a, 1b) demonstrated multiple lobulated filling defects in the first part of the duodenum giving the coarse 'cobblestone' appearance

FIG. 1a

FIG. 1b

said to be characteristic of hyperplasia of Brunner's glands. In a recent exacerbation of pain, the effect of large doses of an anticholinergic drug (propantheline bromide 30 mg. t.d.s.) was tried and this produced considerable relief compared with the effect of alkali alone.

CASE 2 P.S., a 25-year-old Cypriot law student, presented in 1960 with a history of upper abdominal discomfort unrelated to meals for two months and a week's history of repeated vomiting of small amounts of blood. At this time, he was under some mental strain due to a difficult relationship with his girl-friend and had in fact received psychiatric treatment for depression. His symptoms improved quite quickly with rest, diet, and resolution of

his emotional problems. During the three years since that episode, he has had recurrent mild upper abdominal discomfort occurring especially following dietary indiscretions such as eating late at night. He has had little relief from alkalis but the mild symptoms have not interfered with his life and he has gained weight. There have been no abnormal physical findings and in particular no abdominal tenderness. A histamine test meal was not performed but the barium meal (Fig. 2) showed the typical changes of hyperplasia of Brunner's glands.

CASE 3 S.S., a highly intelligent schoolboy of 15 years, gave a very long history of recurrent episodes of vomiting and upper abdominal discomfort unrelated to food. Alkali gave no consistent relief but on three admissions

FIG. 2

FIG. 3

to University College Hospital between 1960 and 1962 for exacerbations, his symptoms resolved quickly on withdrawal from his home environment and on bed rest with alkali. He was a rather aggressive, highly strung boy and has been under psychiatric care for about five years. It was noted that his abdominal symptoms were often related to periods of emotional stress when he was particularly difficult to manage at home. There was no relevant family history and physical examination was quite normal. Haematological investigations were normal, there was no occult blood in the stools, and an augmented histamine test meal showed a normal acid response. Barium meal (Fig. 3) showed the characteristic 'cobblestone' appearance of the mucosa in the duodenum, without tenderness or ulceration.

DISCUSSION

It will be noted that the abdominal symptoms in these patients fall into no recognizable pattern. They differ from the behaviour of those of peptic ulceration in that they are not usually relieved by antacids. The diagnosis was, in each instance, only made radiologically. This has been the case with those examples previously reported. The symptoms have consisted of post-prandial pain, sometimes nausea and vomiting (Feldman and Feldman, 1958; Dodd, Fishler, and Park, 1953). Haematemesis has been noted (Buchanan, 1961), and intussusception, resulting in high intestinal obstruction, has been observed (Lempke, 1959). When such clearly organic occurrences are found in association with a single demonstrable pathological change, it is difficult to escape the conclusion of a causal relationship between the two. However, in patients with the more usual nebulous symptoms it may be argued that the radiological findings are not necessarily responsible for the clinical picture. In two of the three cases reported here, some psychological disturbance could be established, but it was no greater than can often be found on detailed enquiry into anyone's life situation.

Part of the difficulty in assessing the significance of hyperplasia of Brunner's glands stems from the lack of understanding of the pathogenesis of the change. It is probable that one of the factors responsible for the relative resistance of the duodenum to peptic ulceration is the secretion of an alkaline juice, containing mucin, by the glands (Griffith and Harkins, 1956; Grossman, 1958). It is not surprising, therefore, that when the rather rare condition of hyperplasia of Brunner's glands has been reported it has been suggested that the change was a response to hypersecretion of acid by the gastric mucosa (Erb and Johnson, 1948; Dodd *et al.*, 1953; Feldman and Feldman, 1958; Jonsson and Stormby, 1960; Buchanan, 1961). But there are features of the

condition which make it difficult to accept this hypothesis without some reservation. Although hyperchlorhydria is not uncommon, hyperplasia of Brunner's glands is rare. It has not been reported in the Zollinger-Ellison syndrome. Robertson (1941), in a careful review, noted the great variation in quantity of Brunner's glands from duodenum to duodenum and could find no correlation between incidence of peptic ulceration and numbers of Brunner's glands; he regarded them as quite inert, showing no tendency to hypertrophy in the face of duodenal ulceration. Some cases of hyperplasia have had a moderate hyperchlorhydria, others, such as cases 1 and 3, have had a normal or low secretion of acid. A relationship to gastric acidity is not established and if hyperplasia of the glands is to be regarded as a response to hyperstimulation rather than a primary new growth, it seems probable that a stimulus other than acid peptic juice is responsible. Possible factors include vagal activity, local mechanical irritation, cholinergic drugs, and a hormonal substance liberated from the duodenum closely allied to or identical with secretin (Grossman, 1958).

On this hypothesis, the uncertain value of antacid becomes understandable and the rational therapy would include large doses of an anticholinergic drug. It is noteworthy that, in case 1, the only one in which no possible psychological disturbance could be found, symptoms were resistant to all treatment except large doses of propantheline though serial barium meals showed no change in the appearance of the duodenum.

Treatment of hyperplasia of Brunner's glands should, in any case, be conservative. There is no evidence that the condition is conducive to malignant change and in one instance (Erb and Johnson, 1948) operation was followed by the appearance of peptic ulceration within a fortnight, possibly due to the removal of the protective secretion of the glands.

REFERENCES

- Buchanan, E. B. (1961). Nodular hyperplasia of Brunner's glands of the duodenum. *Amer. J. Surg.*, **101**, 253-257.
- Cattell, R. B., and Pyrtek, L. J. (1949). Multiple polyps of the duodenum. *Lahey Clin. Bull.*, **6**, 73-79.
- Christie, A. C. (1953). Duodenal carcinoma with neoplastic transformation of the underlying Brunner's glands. *Brit. J. Cancer.*, **7**, 65-67.
- Culver, G. J., and Caccese, R. (1957). Benign intraluminal polypoid adenoma of the first portion of the duodenum. *Radiology*, **69**, 263-265.
- Dobek, J. (1961). Hypertrophy of Brunner's glands. [In Polish.] *Pol. Przegl.*, **25**, 165-172.
- Dodd, G. D., Fishler, J. S., and Park, O. K. (1953). Hyperplasia of Brunner's glands. *Radiology*, **60**, 814-821.
- Erb, W. H., and Johnson, T. A. (1948). Hyperplasia of Brunner's glands simulating duodenal polyposis. *Gastroenterology*, **11**, 740-745.

- Feldman, M. Jr., and Feldman, M. Sr. (1958). Hyperplasia and tumors of Brunner's glands of the duodenum. *Maryland med. J.*, **7**, 92-94.
- Griffith, C. A., and Harkins, H. N. (1956). The role of Brunner's glands in the intrinsic resistance of the duodenum to acid-peptic digestion. *Ann. Surg.*, **143**, 160-172.
- Grossman, M. I. (1958). The glands of Brunner. *Physiol. Rev.*, **38**, 675-690.
- Jacobius, H. L. (1940). Report of a Brunner gland adenoma of the duodenum discovered incidentally at autopsy. *J. Mt Sinai Hosp.*, **7**, 212-216.
- Jonsson, N., and Stormby, N. G. (1960). Brunneros och brunnerom. *Nord. Med.*, **64**, 1585-1587.
- Lempke, R. E. (1959). Intussusception of the duodenum: report of a case due to Brunner's gland hyperplasia. *Ann. Surg.*, **150**, 160-166.
- Robertson, H. E. (1941). The pathology of Brunner's glands. *Arch. Path.*, **31**, 112-130.
- Stephens, G. L., and Harbrecht, P. J. (1958). Bleeding Brunner gland adenoma of duodenum simulating duodenal ulcer. *Ann. Surg.*, **148**, 845-850.