Coarse duodenal folds in patients with peptic ulcer

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In 1964, Fraser, Pitman, Lawrie, Smith, Forrest, and Rhodes reported a group of 33 patients with typical ulcer dyspepsia in whom no ulcer could be demonstrated radiologically. However, the mucosal folds in the duodenum were unusually coarse and the pattern of gastric acid secretion was similar to that in duodenal ulcer. We have recently reported our findings in 40 patients with coarse duodenal folds. Seventeen of these patients had an ulcer when first seen or developed one subsequently (Rhodes, Evans, Lawrie, and Forrest, 1967).

Because of the association of coarse duodenal folds with a high acid secretion and sometimes with duodenal ulcer, we have now examined the frequency of abnormal duodenal folds in a series of patients with duodenal or with gastric ulcer.

METHODS

Barium meal radiographs from 102 patients were reviewed: 88 had a duodenal ulcer and 14 a gastric ulcer. The patients were chosen at random from two groups: one group had been admitted to hospital because of severe symptoms and the other consisted of patients referred through the general practitioners' x-ray unit and studied as outpatients. Gastric acid secretion was measured by the histamine infusion technique (Lawrie, Smith, and Forrest, 1964). An attempt was made to assess the presence or absence of coarse folds. If the folds were thought to be large, they were recorded as moderate or marked. The radiographs were assessed by one observer who had no knowledge of the patients or of their acid secretion.

RESULTS

There are normally small folds of mucosa in the duodenal bulb. In many of the films reviewed, this appearance was replaced by irregular folds which distorted the outline of the bulb and in some cases gave the appearance of nodules protruding into the lumen (Fig. 1). The abnormal appearance often extended into the second and third part of the duodenum where the mucosal folds were large and gave a cobblestone appearance. Occasionally, the proximal jejunum was also involved and then the appearance was similar to that found in patients with idiopathic steatorrhoea.

In the 88 patients with duodenal ulcer, acid secretion was 43 ± 4·6 milliequivalents per hour (normal 24·9 ± 2·2); 22 had coarse duodenal folds (25%) and in six of them the folds were 'marked'. In the patients who had normal folds, the secretion of acid was 40·3 ± 13·8 m-equiv per hour; in those with coarse folds, it was 45·8 ± 10·1 m-equiv per hour. This difference was not significant (Fig. 2). However, five of the six patients with 'marked' coarse folds had an acid secretion greater than 57 m-equiv per hour. The sixth patient secreted 43 m-equiv per hour, but a diagnosis of Zollinger-Ellison syndrome was suspected since his basal secretion was 16 m-equiv per hour. Only three patients had both coarse duodenal and jejunal folds.

In the 14 patients with gastric ulcer, the acid secretion was 20·8 – 6·2 m-equiv per hour. Only

FIG. 1. Radiograph from a patient with duodenal ulcer; there are marked coarse folds in the bulb and second part of the duodenum.
two had coarse duodenal folds and in both of them the acid output was high (Fig. 2).

**DISCUSSION**

A number of authors have reported coarse duodenal folds on radiological examination and the appearances have been attributed alternatively to duodenitis (Kirklin, 1934; Ritvo and Shaffer, 1952) or to hypertrophy of Brunner's glands (Dodd, Fishler, and Park, 1953). It has been shown that patients with coarse duodenal folds have a high acid secretion and may also have a duodenal ulcer (Fraser et al, 1964; Burns and Laws, 1966; Rhodes et al, 1967).

Our present findings show that coarse duodenal folds are more commonly associated with duodenal ulcer than with gastric ulcer. In patients with duodenal ulcer, the acid output was similar in patients with and patients without coarse folds, but patients with markedly coarse folds had a very high acid output. In two patients with a gastric ulcer and coarse folds, acid secretion was similar to that in duodenal ulcer. The incidence of coarse mucosal folds in the duodenum in patients with chronic duodenal ulcer is very high in this series (25%). This high figure is thought to be due to the fact that this group of patients had been investigated because of the severity of their symptoms. Burns and Laws (1966) related the acid output to the size of the mucosal folds in the stomach and duodenum in patients with miscellaneous forms of dyspepsia or anaemia. They had difficulty in grading patients who had radiological evidence of gastric ulcer because of resting gastric secretion and deformity of outline due to the ulcer. However, they found a highly significant correlation between gastric folds and acid secretion in patients with no focal gastric lesion. Our findings show that patients with a high acid secretion may or may not have coarse mucosal folds. However, if a patient has very coarse folds in the duodenum, his acid secretion will probably be very high.

The coarse mucosal appearance has been thought by Kirklin (1934) to be due to contraction of the muscularis mucosa as a result of high duodenal acidity. We believe that the abnormality is functional rather than anatomical as the change is inconstant, continually varying when observed fluoroscopically. There is a marked difference between the appearances shown radiologically and at operation (Rhodes et al, 1967). The appearance is well known to occur in patients with the Zollinger-Ellison syndrome (Zollinger and Ellison, 1955; Zulrod, Pieper, Hlbish, Smith, Dutcher, and Werner, 1958; Cooke, Fowler, Gaddie, Cox, Meynell, and Brewer, 1960).

**SUMMARY**

Coarse duodenal folds on radiological examination are common in patients with duodenal ulcer, being present in 25% of 88 patients in this series. The acid output in those with moderate coarse folds was similar to those without coarse folds; the acid secretion in those with marked duodenal folds was very high. Only two of 14 patients with gastric ulcer had coarse duodenal folds and their acid output was high.

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