Bubble-clicking results related to gestation, RDS, and L : S ratio

Bubble clicking result	Gestation (weeks)	No of infants	Mean L : S ratio	Cases of RDS	
				No	%
Positive	38-42	45	3.00	0	
	29-37	12	3.15	0	
Negative	38-40	9	2.19	5	56
	25-37	36	2.01	14 (5 died)	39

the bubbles appear to slowly expand and then contract suddenly. This repeats rhythmically until the bubbles disappear. If the result is negative the bubbles disappear rapidly without clicking.

Bubble clicking was not present in any of the babies with RDS. In some of these babies serial aspirates were tested and clicking was absent until after recovery. Clicking also became more common with increasing gestational age. The L : S ratios of the same aspirates showed a highly significant relationship with the bubble-clicking results ($P < 0.001$; $\chi^2 = 25.1$). Infants with birth asphyxia were less likely to have bubble clicking than infants with no asphyxia ($P < 0.001$).

Comment

The L : S ratio is a useful test for confirming the diagnosis of RDS, but it measures only the chemical components of lung surfactant. The bubble-clicking test is quick to perform and gives valuable information about the surface activity of the aspirate and thus the available lung surfactant to a newborn infant.

¹ Gluck, L., *et al*, *American Journal of Obstetrics and Gynecology*, 1971, **109**, 440.

² Weller, P H., *et al*, *Lancet*, 1976, **1**, 12.

³ Pattle, R E., *Proceedings of the Royal Society. Series B*, 1958, **148**, 217.

⁴ Gandy, G., *et al*, *Archives of Disease in Childhood*, 1968, **43**, 8.

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(Accepted 24 November 1977)

Institute of Obstetrics and Gynaecology, Queen Charlotte's Maternity Hospital, London W6 0XG

CHRISTINE E PARKINSON, MIBiol, research assistant
GANESH SUPRAMANIAM, MRCP, senior house officer
DAVID HARVEY, FRCP, consultant paediatrician

Acquired double pylorus

The first case of a double pylorus was reported in 1969 by Smith and Tuttle.¹ Since then a further 30 cases have been described. The cause has been debated. Most represent a gastroduodenal fistula resulting from chronic peptic ulceration, but some workers claim that a true congenital duplication of the pylorus may also occur.

We report a case of a gastroduodenal fistula that occurred in association with a penetrating posterior benign ulcer of the gastric antrum.

Case report

A 58-year-old woman developed seropositive rheumatoid arthritis in 1950 at the age of 31. Symptoms were initially controlled with salicylates and phenylbutazone, but after 1961 she required corticosteroids. Postprandial epigastric pain responded to enteric-coated prednisolone and she received 5 mg daily throughout 1976. She was admitted in January 1977 with the sudden onset of severe epigastric pain. She was thin, weighed 38.7 kg, and was clinically anaemic. There were severe rheumatoid changes in her hands, wrists, elbows, and knees. Her pulse was 80/min and blood pressure 120/80 mm Hg. Abdominal examination showed nothing abnormal.

Investigations showed haemoglobin 7.6 g/dl, mean cell volume 78 fl, white blood count $9.3 \times 10^9/l$, erythrocyte sedimentation rate 54 mm in first hour (Westergren). Blood film showed microcytosis and target cells. Rose-Waaler titre was 1/32 and anti-nuclear antibody 1/10. Barium meal showed a 2-cm gastric ulcer on the lesser curve, which was considerably shortened. At endoscopy the ulcer was in the roof of the antrum posteriorly adjacent to a large fistula communicating with the duodenum. The

Radiological (left) and endoscopic (right) appearances of (A) pyloric canal and (B) gastroduodenal fistula.

appearances were those of a double pylorus. Biopsies showed an active atrophic gastritis without evidence of malignancy.

Treatment with cimetidine (200 mg three times a day and 400 mg at night) was begun and the enteric-coated prednisolone continued. The dyspepsia rapidly improved, and at endoscopy six weeks later the ulcer was completely healed. The appearance of a double pylorus was unchanged (see figure). The fistula was confirmed radiologically. Biopsy of gastric mucosa again showed an active chronic gastritis.

Comment

Duplication of the pylorus may take two forms: either a large fistulous communication resulting in the appearance of a pyloric band, as in this case, or a narrow irregular channel. Most cases are acquired but some have been regarded as congenital. Evidence proposed for a congenital origin has been the presence of an intact muscularis mucosae and the coexistence of another congenital abnormality.² Neither of these features are conclusive evidence of a congenital origin, and in the case reported by Sufian *et al*² the heavy intake of alcohol and aspirin might have caused a gastroduodenal fistula secondary to an ulcer that had subsequently healed. The fistula in our case was lined by gastric epithelium but the small size of the endoscopic biopsy specimens did not allow the architecture of the mucosal layers to be adequately assessed.

Rokitansky³ has suggested that the type of gastroduodenal communication associated with a large fistula may be formed by two ulcers—one on the lesser curve of the stomach and the other in the duodenum—both eroding towards each other. There is, however, only one case reported where both a duodenal and a gastric ulcer were observed. Nevertheless, most of the reported cases of double pylorus have been associated with peptic ulceration.^{3,4}

Clearly, the widespread use of upper gastrointestinal endoscopy is likely to disclose more cases of this unusual condition. Four cases were reported from 3500 consecutive fiberoptic endoscopies by Hansen *et al*, who found an additional two cases when they reviewed 500 necropsies.⁵ In none of these cases could symptoms be attributed to the double pylorus.

Our case shows that once the ulcer has healed the presence of a double pylorus is not necessarily associated with dyspeptic symptoms. Hence probably all symptomatic cases of double pylorus have associated gastroduodenal mucosal disease. Management should then be directed towards healing the mucosal disease rather than surgically correcting the anatomical abnormality.

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² Sufian, S., Ominsky, S., and Matsumoto, T., *Gastroenterology*, 1977, **73**, 154-157.

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⁴ St John, D J B., *et al*, *Australian and New Zealand Journal of Medicine*, Double pylorus: A complication of chronic gastric ulcer? 1976, **6**, 576.

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(Accepted 8 November 1977)

Academic Department of Medicine, Royal Free Hospital, London NW3 2QG

RICHARD H HUNT, MB, MRCP, RN, honorary lecturer (present address: consultant physician and gastroenterologist, RNH Haslar, Gosport, Hants)

R C DAY, MB, MRCP, research fellow

D P JEWELL, DPHIL, MRCP, senior lecturer