Tubular duplication of the bowel
Use of technetium 99m pertechnetate in diagnosis

Technetium 99m (99mTc) pertechnetate scanning has been of value in the identification of Meckel's diverticulum and cystic duplication of the bowel. Heterotopic gastric mucosa may also be present in tubular duplication of the bowel (Rodgers and Youssef, 1975; Schwesinger et al., 1975), but the preoperative diagnosis of this lesion by 99mTc pertechnetate scanning has not been reported.

Case report

A 4-year-old boy was admitted with a 3-week history of intermittent severe colicky abdominal pain. He had been otherwise well except that at age 2 he had had a single episode of abdominal pain and melaena. On examination there was slight abdominal distension. The rectum contained firm black stool; he appeared anaemic. X-rays of the abdomen showed nonspecific air-filled levels in the area of the right colon. Subsequent barium contrast studies of the oesophagus, stomach, and small bowel were normal. 99mTc pertechnetate scans at 2, 10, and 15 minutes showed increased activity in the area of the terminal ileum which paralleled gastric activity (Fig.). The findings were not characteristic of a Meckel's diverticulum, nor of a cystic duplication of the bowel.

Surgical resection was delayed to allow correction of anaemia with oral iron therapy, but 2 weeks later recurrence of symptoms necessitated exploration. 50 cm proximal to the ileocaecal valve, a 52 cm tubular duplication of the small bowel was identified. The proximal end originated at the base of the mesentery, adjacent to the duodenum, and terminated in the ileum, sharing a common ileal wall for 20 cm.

Fig. Preoperative technetium 99m pertechnetate scans showing diffuse activity in the duplicated bowel which increased in step with the gastric activity.
Peptic perforation of the duplication had occurred at both ends. There was a small communication between the duplicated bowel and ileum. The lesion and adjacent bowel were excised without difficulty and the child recovered uneventfully.

**Discussion**

The use of $^{99m}$Tc pertechnetate to aid in the diagnosis of Meckel's diverticula has become accepted practice (Rodgers and Youssef, 1975). Its usefulness in 2 cases of cystic duplications of the bowel has also been reported recently (Schwesinger et al., 1975).

Tubular duplications of the bowel account for only 10% of enteric duplications (Daudet et al., 1967). The condition may present with poorly localised recurrent abdominal pain, gastrointestinal bleeding, anaemia, gastrointestinal obstruction, or as an intrathoracic mass (Gross et al., 1952). Tubular intestinal duplications are rarely palpable or visualised with barium contrast studies; hence preoperative diagnosis is infrequent (Sieber, 1956; Rios-Dalenz et al., 1965). Heterotopic gastric mucosa may be present similar to that found in Meckel's diverticula. Daudet et al. (1967) reported 14 of 44 tubular duplications to have gastric epithelium. Gastric acid secretion and ulceration may result in pain and bleeding from the adjacent intestinal mucosa, in a manner strikingly similar to that associated with Meckel's diverticula.

$^{99m}$Tc pertechnetate is secreted by the surface gastric epithelial cells (Berquist et al., 1975), is easily administered, has a short half-life (6 hours), and emits only gamma irradiation (Rodgers and Youssef, 1975). The scan is similar to that associated with Meckel's diverticula or cystic intestinal duplications in that the activity increases in step with increasing gastric activity. On the other hand, the scan obtained with tubular intestinal duplications differs from that obtained with Meckel's diverticula and cystic intestinal duplications in the diffuseness of the activity. There is a generalised increase in activity along the duplication rather than increased activity in an isolated area. 'False positive' scans include intussusception, Crohn's disease, meningomyelocele, ureteral obstruction, solitary kidney, bowel haemangioma, and aortic aneurysm (Rodgers and Youssef, 1975).

**Summary**

Preoperative identification of tubular duplication of the bowel is possible by the use of technetium $^{99m}$ pertechnetate if gastric mucosa is present within the duplicated bowel. A case of a 4-year-old boy with abdominal pain is described. The scan showed diffuse activity which increased in step with gastric activity.

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**References**


**Acute neonatal and benign citrullinaemia in one sibship**

**Acute neonatal and benign citrullinaemia**—The spectrum of clinical presentation in citrullinaemia (argininosuccinic acid synthetase deficiency, Fig.) is wide, ranging from a rapidly fatal course in the neonatal period to normal or near normal development (Wick et al., 1973). It has generally been assumed that ammonia occupies the key position in the pathogenetic process, the extent of the enzymatic impairment determining the frequency and severity of hyperammonaemic episodes and hence the prognosis. As in many inborn errors of metabolism the picture is complicated by genetic heterogeneity (Kennaway et al., 1975). We report here on a family with 2 affected sibs, of whom one had the disease in the acute neonatal form while the development of the other has been essentially normal up to the age of 7 years.
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