

Use of pertechnetate ^{99m}Tc for abdominal scanning in localising an ileal duplication cyst: case report and review of the literature

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Abstract. A 10-year-old boy presented with periumbilical postprandial pain and some melena. Physical examination was normal. All investigations were negative except a pertechnetate ^{99m}Tc abdominal scan which showed a very large and horn-shaped focus of high activity in the right flank. An ileal duplication was resected. It was lined by antral gastric mucosa with a large ulcer. The patient was treated successfully. The abdominal pertechnetate scan is discussed.

Key words: Ileal duplication – Pertechnetate ^{99m}Tc

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Introduction

Pertechnetate ^{99m}Tc abdominal scintigraphy is widely used in detecting ectopic gastric mucosa (Conway 1980; Sfakianakis and Conway 1981; Sfakianakis and Haase 1982; Laurin et al. 1990) with a sensitivity of 85% and a specificity of 95% (Sfakianakis and Conway 1981; Sfakianakis and Haase 1982). Usually, ectopic gastric mucosa is located in a Meckel's diverticulum. Nevertheless, it can be found in other abnormalities such as Barrett's oesophagus (Sailer and Janeway 1978) or duplications of the alimentary tract. Non-specific accumulation in other lesions can also be diagnostic in paediatric patients with gastrointestinal bleeding (Ho and Konieczny 1975; Gordon 1980). Here we report the case of an unusual positive pertechnetate ^{99m}Tc scan which suggested the proper diagnosis and led to successful surgery.

Case report

A 10-year-old boy was referred to Saint Antoine Hospital in Lille (France) because of abdominal pain. He was born in India and adopted by a French family. He had been living on the Ivory Coast for 5 years. Two months before admission he had a fever with enanthema. Two days later he began to have periumbilical postprandial pains which became daily. He was at first referred to Abidjan Hospital. On admission, physical examination was normal. All investigations (abdominal ultrasonography, upper gastrointestinal series, barium enema, oesophagogastric endoscopy, stool culture) did not show any abnormality. Antiparasitic trial treatment was without any effect. He was discharged, and psychosomatic disorders were suspected. When his parents came back to Europe, he was still suffering, and the constrictive pains were more acute and localized around the umbilicus and in the right iliac fossa. They always began 30–45 min after meals and lasted for 1 or 2 h. They were not alleviated by food intake. Vomiting or diarrhoea usually occurred just after the pains. Sometimes he passed melena stools. On admission physical examination was again normal except for weight loss. Biological parameters were within normal values. A gastrointestinal parasitosis was excluded by normal parasitological examinations and serodiagnosis. Stool cultures and bacterial serodiagnosis results were also negative. Oesophagogastric endoscopy and abdominal ultrasonography were normal. Cerebral and abdominal CT scan did not demonstrate any abnormality. Other less frequent diagnoses were eliminated: lead poisoning, porphyria, phaeochromocytoma. To exclude Meckel's diverticulum, a technetium scan was carried out. Dynamic gamma-camera imaging was obtained over 20 min after intravenous injection of pertechnetate $\text{Tc } ^{99m}$ (1.85 MBq/kg). No abnormal vascular activity was observed. Then a marked increase in activity was observed in the right flank. This focus of high activity was very large and horn-shaped with a small photopenic image (Fig. 1). The increase of activity during acquisition was exactly similar to that of the gastric area (Fig. 2). The diagnosis was heterotopic gastric mucosa, and because of the extension of the hyperactivity, a small bowel duplication was suggested. Two days later an exploratory laparotomy was performed, and a 20-cm ileal duplication was found 50 cm from the caecum. The duplication was tubular and communicated with the ileum. It formed a blind loop which was lined by antral gastric mucosa. There was a very large and haemorrhagic ulcer at the end of the blind loop. The duplication was easily

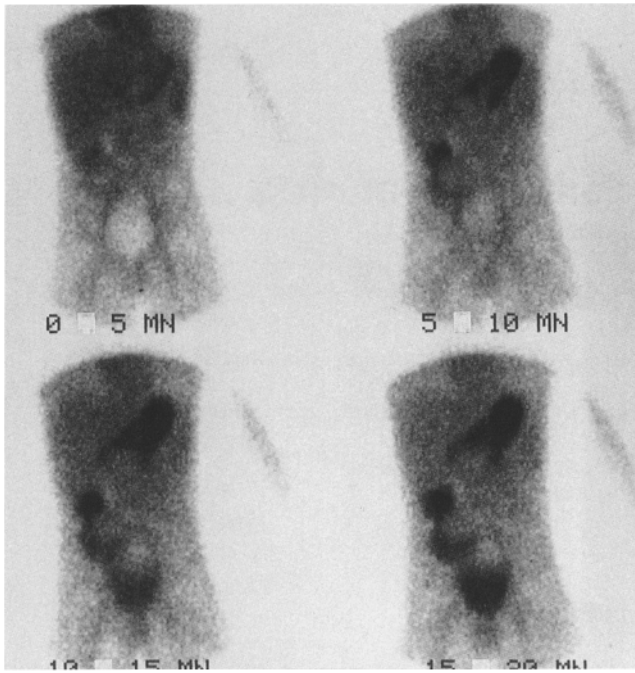


Fig. 1. Sequential 5-min images obtained after injection of pertechnetate ^{99m}Tc showing gastric uptake and abnormal uptake in right flank

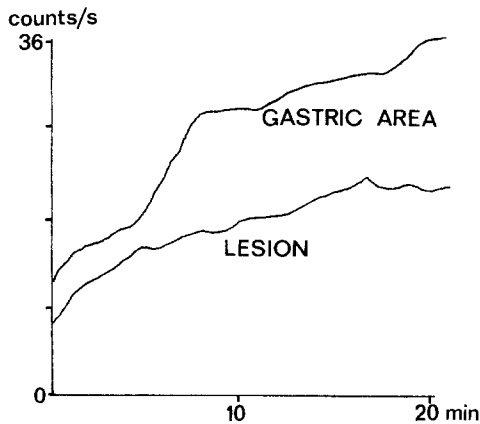


Fig. 2. Time-activity curves in gastric area and in lesion

resected with 13 cm of ileum. The patient was treated successfully and became asymptomatic.

Discussion

Ileum is the most common location for duplications of the alimentary tract (Bower et al. 1978). Duplications may be cystic or tubular, non-communicating or more rarely communicating. The triad of intestinal obstruction, a palpable mass and gastrointestinal hemorrhage is highly suggestive of this diagnosis (Scully et al. 1980). Our patient had some symptoms of intermittent intestinal obstruction and later blood loss.

This case report is noteworthy because of several points. First, this patient was 10 years old, whereas in 85%–90% of patients symptoms appear in the first 2 years of life (Scully et al. 1980). Moreover, two-thirds of the patients are diagnosed prior to 1 year of age. However, a significant number of patients may not become symptomatic until adult life (Bower et al. 1978).

The diagnosis of intestinal duplication was only suggested by technetium scan, while other investigations did not give any information. Diagnosis of duplication may be made by barium study when the communication is wide enough to permit entry of barium into the duplicated segment (Ohba et al. 1981; Gilchrist et al. 1990).

In this case, the pertechnetate scan was unusual. The hyperactivity was too large to be related to a Meckel's diverticulum. Urinary non-specific accumulation of pertechnetate was easily eliminated. Other non-specific accumulations were only briefly considered (Sfakianakis and Conway 1981; Sfakianakis and Haase 1982): there was no argument for intussusception or for obstructed loops of bowel, and there was no vascular activity as would be observed in arteriovenous malformation (Heyman and McCarthy 1990). An inflammatory lesion could not be absolutely eliminated, and intestinal cancer could also give false-positive results (Mehall et al. 1991), but ectopic gastric mucosa in intestinal abnormality such as duplication was suggested because of strictly similar time-activity curves in the lesion and in the gastric area.

An interesting use of the pertechnetate scan in intestinal duplications has been reported in cystic (Schwesinger et al. 1975; Wilson et al. 1977; Winter 1977; Scully et al. 1980) as well as in tubular (Ohba et al. 1981) duplications. Multiple duplications have been discovered by pertechnetate scan (Gilchrist et al. 1990). A photopenic cystic duplication has been observed during a technetium scan (Vazquez et al. 1989). Of course, a pertechnetate scan is positive when duplications contain ectopic gastric mucosa. The frequency of gastric mucosa in duplications is variable among authors, 20%–50% (Bower et al. 1978; Scully et al. 1980; Ohba et al. 1981). In our patient, the whole duplication was lined by gastric mucosa, which gave a highly positive pertechnetate scan. Moreover, ileal duplication which contains gastric mucosa is frequently associated with peptic ulceration and haemorrhage (Bower et al. 1978; Scully et al. 1980). In this case, there was a large ulcer with blood loss. The small photopenic image observed on scan could be related to luminal clot. These complications were responsible for the clinical symptoms.

It should be stressed once more that the pertechnetate scan is a non-invasive procedure which may be easily performed, especially in young patients with unusual abdominal symptoms or gastrointestinal bleeding prior to radiographic contrast studies (Ho and Konieczny 1975).

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