Pertechnetate Abdomen Scan in a Patient with Ascaris Lumbricoides Infestation

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A 6-year-old Vietnamese girl was admitted with a 3-day history of rectal bleeding of unknown etiology. A [^{99m}Tc] pertechnetate abdomen scan was performed and revealed multiple areas of abnormal uptake in the small-bowel region. Subsequent upper gastrointestinal radiography studies revealed an infestation of Ascaris lumbricoides.

Abdomen scanning can be useful in detecting abdominal disorders when rectal bleeding of unknown etiology occurs. While [^{99m}Tc] pertechnetate has been shown to concentrate in the gastric mucosa, abnormal areas of increased activity of pertechnetate may be seen with Meckel's diverticulum (*1–3*). Other abdominal disorders such as abscess, obstructed bowel, appendicitis, perforation of the ileum, and arteriovenous malformation have also produced positive scans (*4–7*). Recently a patient with Ascaris lumbricoides infestation had an abnormal pertechnetate abdominal scan and her case report follows.

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Case History

A 6-year-old Vietnamese girl who had been in the United States for 5 months was admitted with a 3-day history of rectal bleeding. The patient's abdomen was nontender and without organomegaly. Her stool was 1+ positive for occult blood; Hgb: 14.2 g; Hct: 44%; WBC: 11,000/mm^3 and platelets 425,000/mm^3.

A [^{99m}Tc] pertechnetate abdomen scan was performed; it revealed an area of increased activity in the region of the small bowel. An upper gastrointestinal radiography series performed the following day revealed infestation of Ascaris lumbricoides in the small bowel, which corresponded to the region of pertechnetate activity seen in the abdomen scan.

Stool specimens were examined and found positive for ova. The patient was discharged following Antepar therapy. Follow-up history revealed amelioration of the patient's symptoms, which lessens the likelihood of the existence of Meckel's diverticulum.

A 2.0-mCi dose of [^{99m}Tc] pertechnetate was administered intravenously and a dynamic series of images were

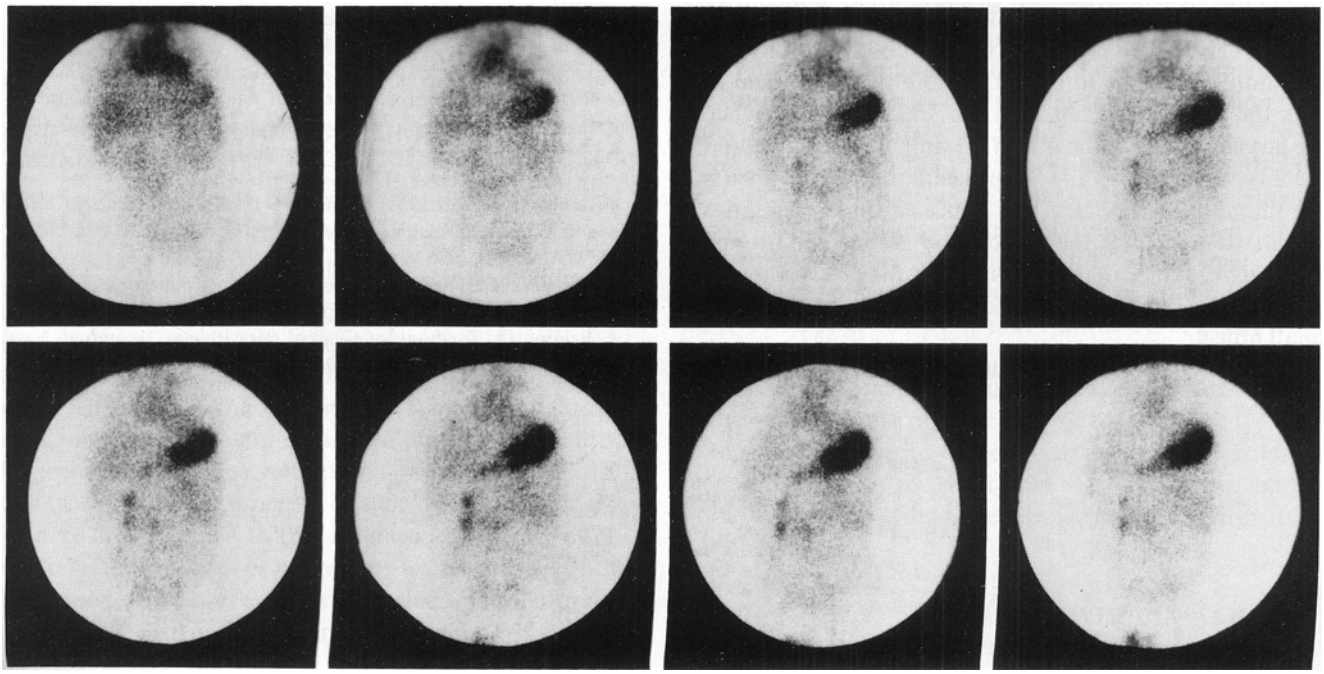

FIG. 1. Pertechnetate abdomen images taken at 4-, 6-, 8-, 10-, 12-, 14-, 16-, and 18-min postinjection show increasing pertechnetate concentration in small-bowel region.

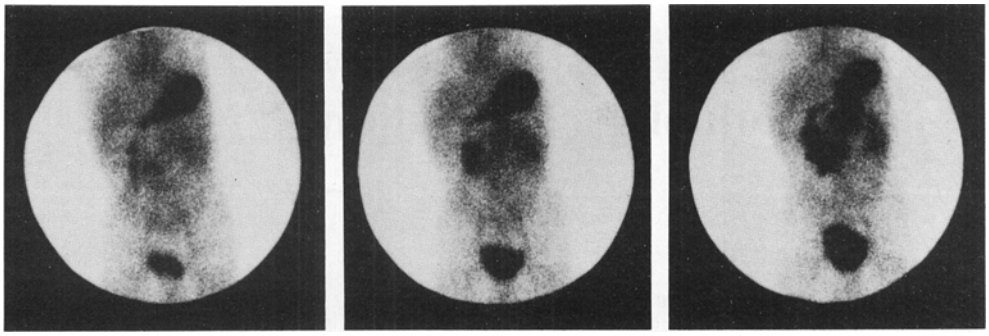

FIG. 2. Pertechnetate abdomen scan (left to right) at 20-, 40-, and 60-min postinjection reveals increasing concentration of pertechnetate in small bowel.

taken every 2 min for 500,000 counts over a 14-min period following injection (Fig. 1). A Picker 4C large field of view camera equipped with an ultrafine collimator was used. Postinjection scans were also taken at 20-, 40-, and 60-min (Fig. 2.). Increased activity in the region of the small bowel can be immediately seen on the 4-min postinjection image.

Discussion

The normal pattern of [^{99m}Tc] pertechnetate concentration in the abdomen is to occur first in the stomach followed by accumulation in the duodenum and concentration in the urinary bladder. The entire colon may be seen 24 hr after injecting the radiopharmaceutical (*1*). The mechanisms of pertechnetate concentration in Meckel's diverticulum and other small-bowel disorders are different. In Meckel's diverticulum, pertechnetate is concentrated in gastric cells of ectopic mucosa. Bleeding from the diverticulum is caused by ulceration of the small bowel adjacent to the gastric mucosa (*1,2*). Obstruction of the small bowel has impaired blood flow, which can produce interstitial edma, which in turn concentrates the pertechnetate (*7*).

In the life cycle of Ascaris lumbricoides, the ova leave the host and are deposited in water, food, or soil by fecal contamination. The human, the definitive host, then injests the ova, which hatch in the small intestine where the larvae penetrate the intestinal wall. Carried by blood, the larvae migrate to the lungs where they are trapped in the pulmonary capillary bed. Once in these capillaries, the larvae penetrate the alveoli and ascend the bronchi and trachea. Once in the sputum, they may be swallowed, descend the esophagus, and develop into adults in the small bowel.

In the small bowel the adult Ascaris may attach to the intestinal mucosa where they obtain nourishment. Irritation of the intestine by toxic and mechanical action of the adult Adcaris may cause entercolitis (*8*). The reaction in the intestinal wall is thought to be the site of pertechnetate uptake.

Conclusion

A case of Ascaris lumbricoides infestation has been described. No clinical or radiographic evidence of classical causes for abnormal pertechnetate accumulation was documented. Because ova of this parasite were seen in stool specimens—and radiographic and scintigraphic findings corresponded to the same anatomical area—we feel that the abnormal pertechnetate accumulation represents intestinal wall reaction to Ascaris lumbricoides.

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