

CASE REPORT

Incidental diagnosis of hiatus hernia on technetium-99m pertechnetate Meckel's scan

Sadaf T Butt*, Shazia Fatima, Ghazal Jameel, Noreen Marwat, Javaid Irfan

Nuclear Medicine Oncology and Radiotherapy Institute (NORI), Islamabad, Pakistan

Abstract

Hiatus hernia is not an uncommon condition. Its true incidence is difficult to estimate since a proportion of the cases are not demonstrated radiologically, and an equal number of clinical diagnoses are made without radiological demonstration.

We report a case of a 4-year-old boy being investigated for severe anaemia, abdominal pain and maleana who was referred to our institute for a technetium-99m pertechnetate Meckel's scan. The scan revealed a pertechnetate-avid area in the chest. Lateral views of the chest and SPECT images showed this area to be localized to the posterior mediastinum. CT images and barium swallow examination confirmed the diagnosis of hiatus hernia.

***Key words**: Hiatus hernia, technetium-99m pertechnetate scan, Barium swallow*

***Correspondence**

Dr Sadaf T Butt
Nuclear Medicine, Oncology & Radiotherapy Institute (NORI)
Hanna road, G-8/3
Islamabad, Pakistan
Tel: 092-051-9260611
Email: drsadafpk@hotmail.com

Introduction

Although hiatus hernia is not an uncommon condition in western countries, its incidence in oriental countries is much lower [1]. It is difficult to estimate the true incidence of hiatus hernia since a number of cases are not demonstrated radiologically and an equal number of clinical diagnoses are made without recourse to radiological imaging. There is no doubt that the condition is far more common than it appears to be given the fact that a large number of cases are asymptomatic whilst others, usually become symptom free by the age of 2 years [2].

Hiatus hernia is frequently of congenital origin, and can lead to morbidity and even mortality. The classical presentation of hiatus hernia in children is vomiting since birth, failure to thrive and dysphagia [2]. The case under discussion is a 4-year-old child who had slightly atypical presentation, and had no history of vomiting, chest infections or dysphagia.

Case Report

A 4-year-old boy was referred to the nuclear medicine department for a Meckel's Scan. He was being investigated for anaemia and occult blood in stools. There was a history of

 2221-0288(201501/01)5:1<67:IDHHTP>2.0.TX;2-M

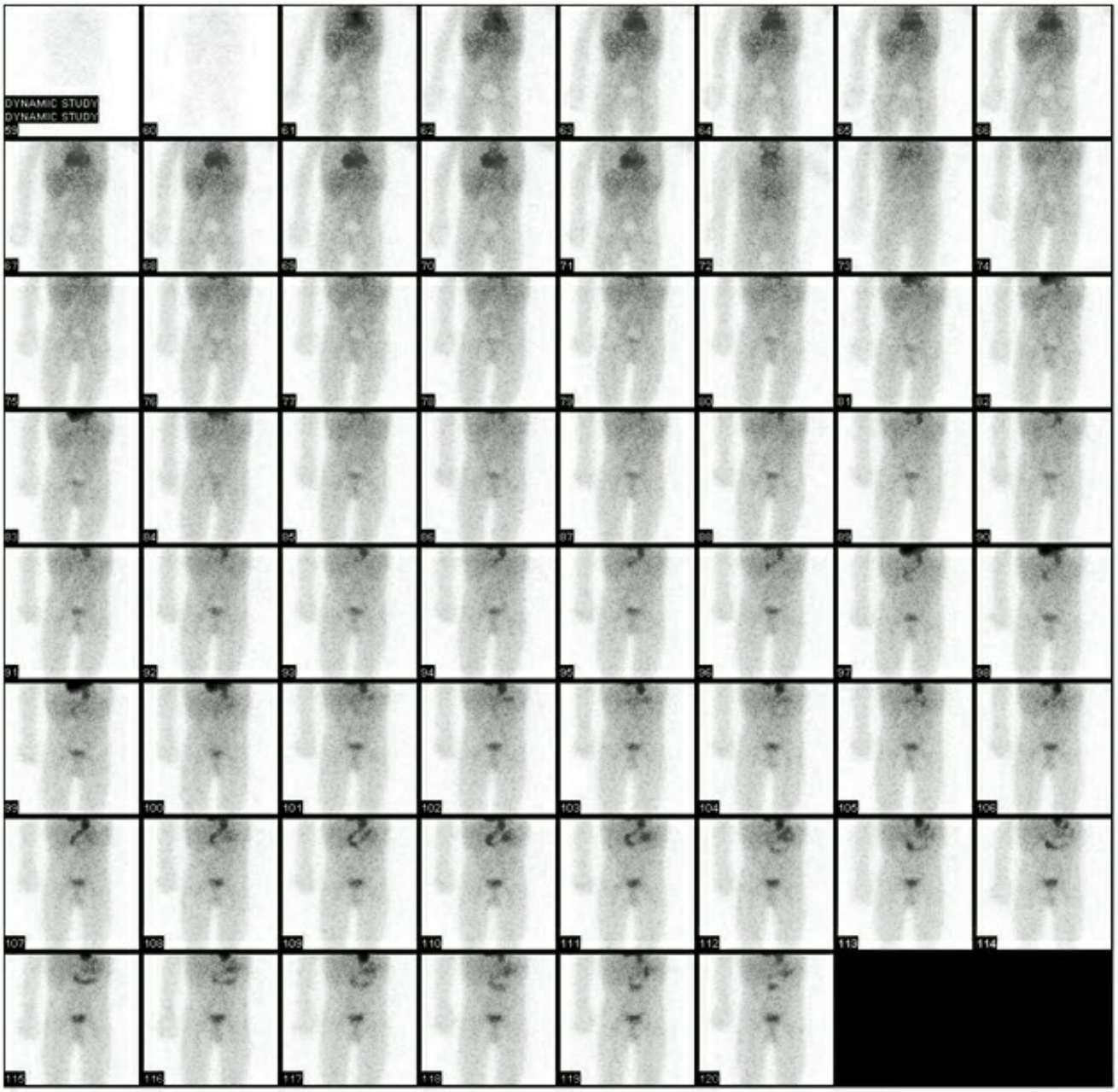

Figure 1 *Dynamic study reveals an accumulation of ^{99m}Tc-pertechnetate in the thorax in the initial part of the study. In subsequent images the patient is moved upwards to bring stomach into the field-of-view which shows tracer uptake in stomach*

generalized abdominal pain and malaena for a year. Due to anaemia, blood transfusions were given 3 days before the scan. He was known case of thallesemia trait. On examination pallor was positive. His haemoglobin level was 3 g/dl, there was marked hypochromic microcytic anaemia, Hb electrophoresis showed a normal Hb electrophoresis pattern, hypochromia (+++), microcytosis (+++), anisocytosis (+), and reticulocyte count were (0.7%). Stool analysis was positive for occult blood. Ultrasound abdomen, liver function tests, renal function tests and serum electrolytes were normal. Iron levels were reduced, i.e. 32ug/l (59-148) and total iron binding capacity was increased 490ug/dl (180-360 ug/dl).

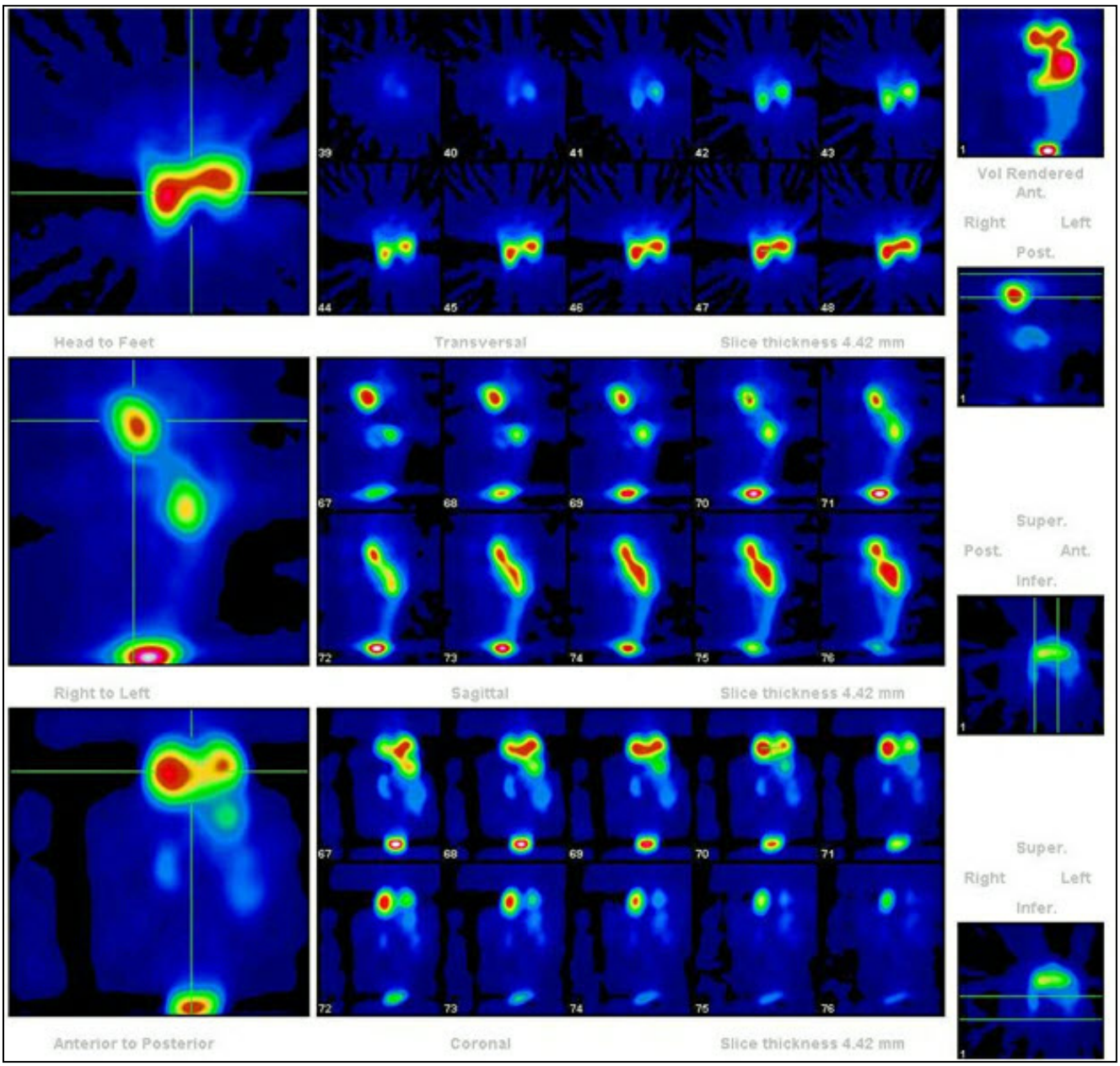

Figure 2 *SPECT images showing stomach located in its normal anatomical position and its connection with the pertechnetate-avid structure in thorax*

A ^{99m}Tc-pertechnetate scan was performed, which revealed accumulation of tracer in the mediastinum (Figure 1), and a few minutes later, the stomach was outlined at its normal anatomical location in the abdomen.

This unexpected activity in the thorax persisted for 30 minutes. Lateral views as well as SPECT images of the region, localized the accumulation to the mediastinum and confirmed its connection with the gastric accumulation (Figure 2).

X-ray chest showed gas shadow behind the cardiac shadow (Figure 3). Correlative non-contrast CT scan of the region showed herniated stomach posterior to the heart (Figure 4). The diagnosis was confirmed with barium swallow study, which showed contrast with air-fluid level in herniated stomach, and its connection with the abdominal part of stomach (Figure 5).

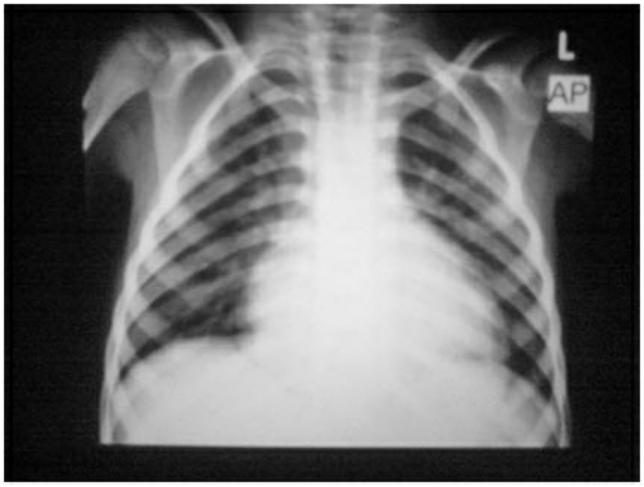

Figure 3 *X-ray chest shows shadow of the bowel along the left and right heart borders*

Figure 4 *CT thorax shows alimentary canal in the posterior mediastinum, behind the heart*

Figure 5 *Barium meal showing contrast in the retro cardiac structure in the thorax and in the stomach in the abdomen*

Discussion

The classical presentation of hiatus hernia is vomiting. Failure to thrive, anaemia, and dysphagia, are the other relatively less common symptoms at presentation [2]. Anaemia in these patients might be due to the very slight daily blood loss. The cause of blood loss in hiatus hernia remains controversial. Oesophagitis due to reflux is commonly held to be the most likely cause although poor absorption of iron has been suggested as a contributing cause to the anaemia in some patients [2, 3]. The patient presented with a history of anaemia, and his stool examination was positive for occult blood. Anaemia due to hiatus hernia is a common presentation. It is more common in patients with gastritis. Lister et al. stated that daily blood loss in patients with hiatus hernia is usually very small and is not usually demonstrable. Malnutrition in these children also does not play an important part. Small but persistent blood loss is considered as the possible cause of anaemia [2].

An upper GI barium series is the definitive method of diagnosing hiatal hernias. A single-

contrast barium swallow performed with the patient in the prone position is more likely to demonstrate a sliding hiatal hernia than an upright double-contrast examination. On double-contrast examination, areae gastricae can be recognized within the intrathoracic stomach [4].

Plain chest radiographs may demonstrate a retrocardiac gas-filled structure. An air-fluid level may be absent in the hernia on supine radiographs; occasionally, differentiation from other retrocardiac masses may be difficult by using supine radiographs. CT scanning is not routinely used in the diagnosis of a hiatal hernia, but it may be a useful for specific indications. A hiatal hernia appears as a retrocardiac mass with or without an air-fluid level. The mass can usually be traced into the oesophageal hiatus on sequential cuts [5].

Radionuclide imaging is not routinely used for the diagnosis of a hiatal hernia, but hiatal hernias may be incidentally found on whole-body radioiodine surveys performed in patients with thyroid cancer, in whom hernias may mimic metastatic cancer. Similarly, technetium-99m pertechnetate and other ^{99m}Tc-labelled isotopes may depict a hiatal hernia incidentally. Duodenogastric reflux in a hiatal hernia can be seen as a retrocardiac activity on ^{99m}Tc-tetrofosmin cardiac SPECT raw-data images. Incidental findings such as extracardiac and retrocardiac activity in the thorax and abdomen should be included on all comprehensive cardiac SPECT reports. Theoretically, a duplication cyst or a neuroenteric cyst containing gastric mucosa may take up radioiodine or technetium compounds [6]

The differential diagnosis of positive scans in the thoracic region using ^{99m}Tc-pertechnetate includes: thoracic duplication cyst, neurogenic tumours, Barrett's oesophagus and hiatus hernias. Kumar *et al.* highlighted the spectrum of scintigraphic findings likely to be encountered in patients with ectopic gastric mucosa using ^{99m}Tc. They found that the lesion accumulated ^{99m}Tc-pertechnetate at the same rate, as did the stomach. However, in duplication cysts they found an initial photopaenic area in the region of the cyst, which filled up with tracer on delayed imaging of up to 24 hour [7]. Contrast enhanced CT scan of the region may help, and barium meal examination is usually diagnostic.

The patient was sent to our hospital for investigation of anaemia with suspected Meckel's diverticulum. The ^{99m}Tc-pertech netate planar Meckel's scan showed incidental uptake in thorax. SPECT imaging was performed to localize the uptake, which was found to be in continuation with the uptake in stomach in the abdominal cavity. The patient was later planned for surgery after correction of his anaemia.

References

1. Kim KC, Park HJ, Yoon DS, Chi HS, Lee WJ, Lee KS, et al. A Case Of Para Esophageal Hernia Repaired By Laparoscopic Approach. Yonsei Med J 1996; 37, p151-157.

2. Lister J. Hiatus hernia in Children, Post Grad Med J 1972; 48, p501-506.

3. Holt J M, Mayet FGH, Warner GT, Callender ST, Gunning AJ. Iron Absorption and Blood Loss In Patients With Hiatus Hernia. Bris. Med. J 1968; 3, p22-25.

4. Gürgün C, Yavuzgil O, Akín M. Images in cardiology. Paraoesophageal hiatal hernia as a rare cause of dyspnoea. Heart. 2002; 87(3):275.

5. Passen E, Wann S. Incidental Finding on Computed Tomography of a Large Hiatal Hernia Causing Hypotension. Am Heart Hosp J. 2008; 6:57-59.

6. Shih WJ, Shih GL, Huang WS, Milan P. Duodenogastric reflux in a hiatal hernia seen as retrocardiac activity on ^{99m}Tc-tetrofosmin cardiac SPECT raw-data images. J Nucl Med Technol 2007; 35(4):252-4.

7. R Kumar, M Tripathi, N Chandrashekar, S Agarwala, A Kumar, J B Dasan et al. Diagnosis Of Ectopic Gastric Mucosa Using 99Tcm- Pertechnetate: Spectrum Of Scintigraphic Findings. The British Journal of Radiology 2005; 78: 714–720.