Cerrahi Sanatlar Dergisi
Journal of Surgical Arts
ISSN: 1308-0709
Vol: 6 No:2 Year: 2013

Original study / Klinik çalışma

99mTc-PERTECHNETATE SCAN IN DIAGNOSING MECKEL'S DIVERTICULUM

Meckel divertikülü tanısında Tc99m Pertechnetate sintigrafisinin yeri

Arkaprovo Roy[1], Debiprasanna Ghosal[2], Atanu Jana[2]

Maldamedical College[1] and RG KAR Medical College[2] INDIA

ABSTRACT

Meckel's diverticulum (MD) is one of the commonest congenital anomaly of the gastro-intestinal tract involving the small bowel. A pre-operative diagnosis of a MD is often difficult to make. 99mTc-pertechnetate scintigraphy is helpful in diagnosing the presence of ectopic gastric mucosa. We had a 2 year old boy presented with blood stained stool for 3 months. While abdominal ultrasound and upper gastroiintestinal endoscopy could not make the diagnosis. 99mTc-Pertechnetate scan showed abnormally increased tracer uptake in the umbilical region. He then underwent diagnostic laparoscopy and open resection of the MD and end to end anastomosis. The resected specimen subsequently found to contain gastric mucosa on histopathological examination. Here in, we discused the case in view of the literature.

Keywords: Meckel's divericulum, diagnosis, 99mTc-Pertechnetate scan.

ÖZET

Meckel divertikülü ince barsakları tutan ve gastrointestinal sistemde en fazla karşılaşılan anomalidir. Ameliyat öncesinde hastalığın tanısı oldukça zor olup, Tc99m Pertechnetate sintigrafisi ile mide mukozasının ektopik yerleşiminin gösterilmesi tanıya yardımcı olabilir. Burada, üç aydır kanla karışık gayta yapan Meckel divertiküllü iki yaşındaki bir çocuk hasta sunulmuştur. Yapılan gastrointestinal sistem endoskopileri ve ultrasonografi ile tanı konulamayan hastada, Tc99m Pertechnetate sintigrafisi ile göbek bölgesinde aktivite tutulumu saptandı. Yapılan diagnostik laparoskopi ile Meckel divertikülü saptandı ve rezeksiyon ile uç uca anastomoz yapıldı. Spesmenin incelenmesi sonucunda mide mukozası saptandı. Burada vaka literatür verileri ışığında tartışılmıştır.

Anahtar kelimeler: Meckel divertikülü, tanı, Tc99m Pertechnetate sintigrafisi.

Cer San D (J Surg Arts), 2013;6(2):42-44.

INTRODUCTION

Meckel's diverticulum (MD) is the most common congenital anomaly of the gastro-intestinal tract involving the small bowel (1). MD are much more common in early life, more than 50% of the cases found by the age of 2 years (2) occurring on the antimesenteric border of the distal ileum. MD is a true diverticulum, composed of all layers of the intestinal wall, and is lined by normal small intestinal mucosa. It frequently contains heterotopic gastric and pancreatic mucosa and less commonly, duodenal, colonic, or biliary mucosa. Ectopic gastric mucosa may give rise to potential parietal cell production of gastric acid and pepsin and subsequently result in mucosal damage and bleeding. Less commonly, there may be perforation, obstruction, and occasionally pain (2). The bleeding may be risk and blood transfusion is often required. To avoid frequent bleeding and associated blood loss it is necessary to diagnose MD early. A pre-operative diagnosis of a MD is often difficult to make. 99mTc-pertechnetate scintigraphy is helpful in diagnosing the presence of ectopic gastric mucosa, because it contrasts against the relatively low background radioactivity of the abdomen or of the chest (3,4). We report a

Corresponding Address: Maldamedical College, INDIA E mail: drarkanatmed1997@gmail.com

case of MD diagnosed on 99mTc-pertechnetate scintigraphy.

CASE

Two year old boy presented with blood stained stool for 3 months. His hemoglobin was 8 gm/dl for which he received blood transfusion. There was no features suggestive of intestinal obstruction. He did not complain of abdominal pain. His birth history was normal.Abdominal ultrasound did not reveal any abnormality. Upper GI endoscopy showed only lymphoid hyperplasia of Brunners gland and duodenum. 99mTc-Pertechnetate scan showed abnormally increased tracer uptake in the umbilical region.

He then underwent diagnostic laparoscopy and open resection of the MD and end to end anastomosis. The resected specimen subsequently found to contain gastric mucosa on histopathological examination.

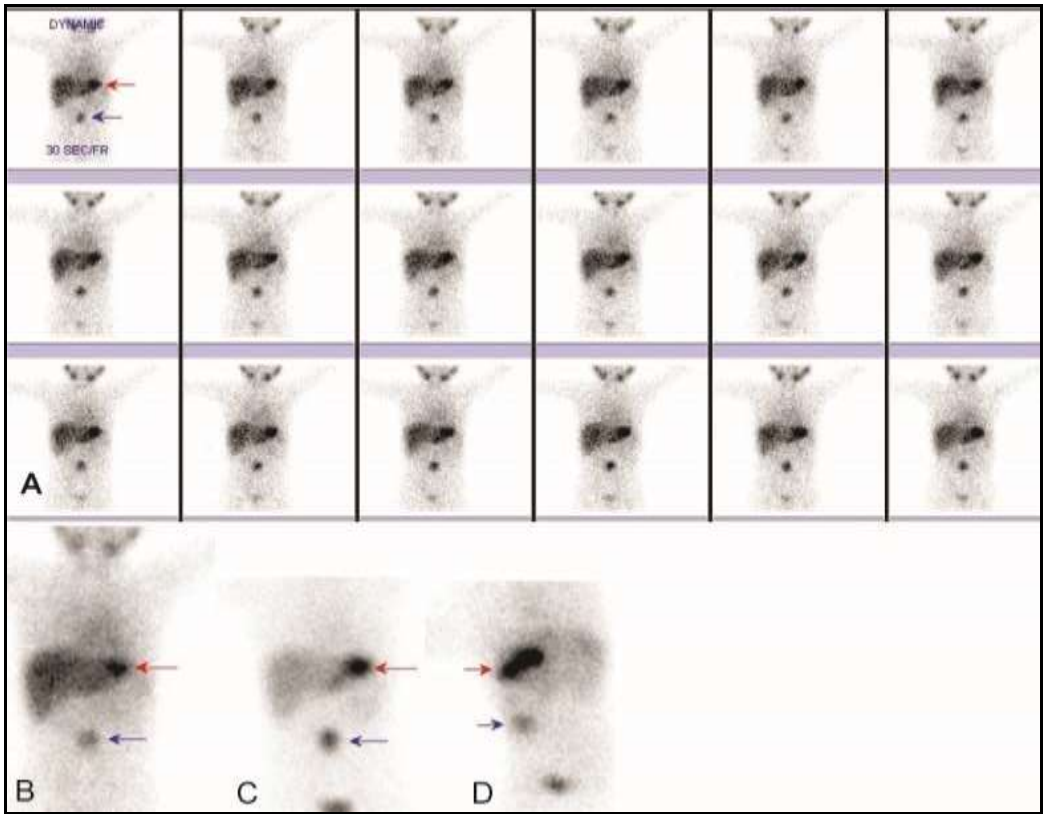

Figure 1: 99mTc-Pertechnetate scan show simultaneous appearance of tracer at the umbilical region of the abdomen along with tracer uptake in the stomach in the dynamic phase images (A). Subsequent anterior static images at 20 minutes (B) ,30 minutes (C) & left lateral (D) image show intensification of the tracer uptake at the umbilical region.

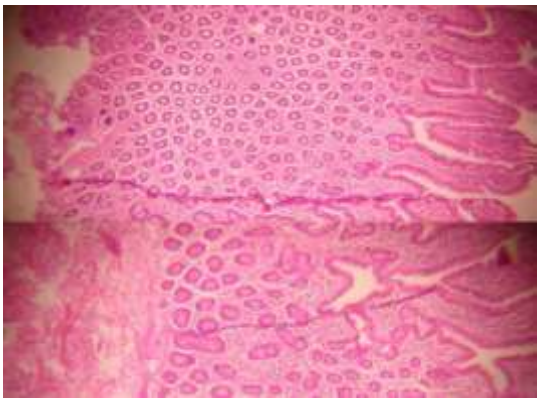

Figure 2: Photomicrograph (original magnification x 100; hematoxylin-eosin [H-E] stain) shows the diverticulum composed of all layers of the intestinal wall. Normal small intestinal mucosa and gastric mucosa.

DISCUSSION

MD results from improper closure and absorption of the omphalomesenteric duct. The entity was named in 1809, when Johann Friedrich Meckel the Younger first reported his research on the diverticulum's anatomy and embryology (5). The preoperative diagnosis of a complicated Meckel diverticulum can be challenging and is often difficult to establish. 99mTc-Pertechnetate is taken up and secreted by the tubular glands of the gastric mucosa. The affinity of 99mTc-Pertechnetate for gastric mucosa makes this radiopharmaceutical a valuable tool to detect heterotopic gastric mucosa. After intravenous injection of Tc-99m pertechnetate, a MD containing gastric mucosa will manifest as a small rounded area of

increased activity in the right lower quadrant or umbilical region according to the position. Scintigraphy is a easy, non invasive and possibly the most accurate among all non invasive methods (6). Accuracy of scintigraphy is of about 90% (3). Sensitivity depends on the size of active gastric mucosa in Meckel's diverticulum (7). A combination of pentagastrin and H2 receptor blockers (8) and glucagon may be used to improve results of nuclear imaging. False-negative results occur in MD that do not contain heterotopic gastric mucosa or when there is an inadequate number of gastric cells to concentrate the 99mTc-Pertechnetate anion.

In conclusion; 99mTc-Pertechnetate scan is a very simple, useful procedure to detect MD as a cause of gastero-intestinal bleeding in children. It should be used as a initial investigation in work up of suspected MD.

REFERENCES

1. Martin JP, Connor PD, Charles K. Meckel's diverticulum. Am Fam Physician 2000; 61: 1037-1042

2. Rutherford RB, Akers DR. Meckel's diverticulum. A review of 148 pedi-atric patients with special reference to the pattern of bleeding and to mesodiverticular vascular bands. Surgery 1966; 59: 618-626.

3. Sfakianakis GN, Conway JJ. Detection of ectopic gastric mucosa in Meck-el's diverticulum and in other aberrations by scintigraphy: II. indications and methods- a 10 year experience. J Nucl Med 1981; 22: 732-738.

4. Swaniker F. The utility of technetium 99m pertechnetate scintigraphy in the evaluation of patients with Meckel's diverticulum. J Pediatr Surg 1999; 34: 760-764.

5. Edmonson JM. Johann Friedrich Meckel the younger: Meckel's diver-ticulum. Gastrointest Endosc. 2001;54:19A–20A.

6. Douglas M. Howarth. The role of nuclear medicine in the detection of acute gastrointestinal bleeding. Sem Nucl Med 2006; 36: 133-146.

7. Papatolios T, Giannoulis E, Theocharidis A. The scintiscan of Meckel's di-verticulum and its complications. Hell J Nucl Med 2000; 3: 156-159.

8. Heyman S. Meckel's diverticulum: possible detection by combining pentagastrin with histamine H2 receptor blocker. J Nucl Med 1994; 35: 1656-1658.