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Meckel's Diverticulum With Ectopic Pancreatic And Gastric Tissue : A Rare Occurrence

Dr. Kaninika Sanyal. Dr Preeti Diwakar, Dr Priyanka Gogoi, Dr Sonali Dixit

61/C, pocket B, Dilshad garden, New delhi

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Abstract:

Introduction: Meckel's diverticulum(MD) is the most common congenital malformation of the gastrointestinal tract. It represents a persistent remnant of the omphalomesenteric duct. MD is a true diverticulum consisting of all layers of the normal intestinal wall. In about 50% of cases, it also contains various types of ectopic tissues. The presence of dual ectopic tissue in MD is however quite rare. We report a rare case of MD having both ectopic pancreatic and gastric tissue.

Case report: An 11 year old boy presented with complaints of abdominal distension, bilious vomiting and non-passage of flatus or feaces since last 3 days. X ray abdomen showed multiple air fluid levels while CECT abdomen revealed a transition point in ileum between dilated bowel loops. Laparotomy was done and MD was identified 2 feet proximal to ileocecal junction. The small bowel measured 11x 3 cm and the attached diverticulum measured 7 x 2.5 cm. On microscopy, MD was identified with both ectopic pancreatic and gastric tissues in the muscularis propria.

Conclusion: MD is the most common congenital anomaly in gastrointestinal tract but preoperative diagnosis is difficult. Histopathology is required to confirm a diagnosis of MD and identify ectopic tissues which cause various complications.

Keywords: Meckel's diverticulum, ectopic tissue, pancreas acini, ectopic gastric mucosa

Introduction:

Meckel's Diverticulum(MD) is the most common congenital malformation of gastrointestinal tract(GIT) occurring in about 2 % of the population. [1] It occurs when the vitelline duct or omphalomesenteric duct fails to obliterate during fifth week of fetal development. [2] It is a true congenital diverticulum containing all the layers of intestinal wall.[3] Despite being the most prevalent congenital abnormality, most cases are discovered incidentally during laparotomy, laparoscopy, or at autopsy. It is usually clinically silent, however can lead to certain complications that mimic common diseases like appendicitis, peptic ulcer disease, etc. Presence of ectopic tissue is a common occurrence in Meckel's diverticulum occurring in about 50 % of cases. Gastric mucosa is the commonest ectopic tissue (23-50 %) followed by pancreatic tissue (5-16%) and less commonly duodenal, colonic and biliary tissue may also be found. [2] The complications arising in MD occur mainly due to these ectopic tissues. Herein, we report a rare case of Meckel's Diverticulum having both ectopic gastric and pancreatic tissue.

Case report:

An 11 year old boy presented to the Surgery Emergency with complaints of abdominal distension, bilious vomiting and non-passage of flatus or feces since last 3 days. There was no past history of similar complaints and no history of tuberculosis. Complete blood count, renal function test and liver function test were done and all the results were within normal range. X ray abdomen showed multiple air fluid levels. CECT abdomen revealed a transition point in

ileum between dilated bowel loops. In view of clinical suspicion of intestinal obstruction, abdominal exploratory laparotomy was done. During surgery, Meckel's diverticulum was identified 2 feet proximal to ileocecal junction leading to obstruction. Resection and anastomosis was done and sent for histopathological examination. Resected small bowel with diverticulum was received. The small bowel measured 11x 3 cm and the attached diverticulum was 7 cm long with diameter of 2.5 cm in the most dilated part. Focal areas of congestion were identified on the surface. Cut section showed unremarkable ileal and diverticular mucosa while the base of the diverticulum was focally congested.(Figure 1) On microscopy, sections from diverticulum revealed all layers of bowel wall, including mucosa, submucosa, muscularis propria and serosa. Ectopic pancreatic tissue was identified in the form of pancreatic acini in the muscularis propria. Focal area in the diverticulum was lined by foveolar epithelium, with underlying gastric glands lined by chief cells and parietal cells, indicating the presence of ectopic gastric tissue. Based on these findings, a diagnosis of Meckel's diverticulum with both ectopic gastric and pancreatic tissue was given. (Figure 2 A,B,C) The postoperative course was uneventful.

Discussion:

Meckel's Diverticulum(MD) was first explained by Wilhelm Fadricius Hildamus in 1598, but it was in 1809 that Johann Friedrich Meckel described the embryological origin of this type of diverticulum and thus was named after him. [3] Meckel's Diverticulum is usually located in the pelvic or periumbilical region or right iliac fossa. Most common site is at the antimesenteric border of the ileum, 2 ft (60 cm) proximal to the ileocecal valve as seen in the present case. The commonly known "rules of 2 " state that MD occurs in about 2 % of population, is about 2 inches of length, usually within 2 ft of ileocecal valve and usually presents before 2 years of age. [1] However, this is not followed in all cases like in the current case it was 7 cm long and presented at 11 years of age. It is usually asymptomatic, with symptoms seen in 16-44% of cases. [4] Major complications include haemorrhage, obstruction, intussusception, diverticulitis, and perforation. In children, bleeding is the most frequent complication, almost invariably resulting from peptic ulceration of the heterotopic gastric mucosa located within the diverticulum. [4, 5] In the current case, the patient presented with symptoms of intestinal obstruction. Symptoms are more commonly seen in pediatric age group, but it can also present in adults as intestinal obstruction & diverticulitis with incidence varying from 12 to 50 %. [6] It is 3- 5 times more common in males than females. [2]The presence of ectopic tissue in MD is a common occurrence which was noted since early 1900s. It is present in up to 55 % of cases of MD. Gastric mucosa is the most ectopic tissue found in MD, followed by pancreatic tissue (5- 16 %). Other ectopic tissues include jejunal mucosa (2%), Brunner's glands (2%), combination of different tissues occur in only about 2-5 % cases. [1,2,7] The presence of ectopic gastric tissue with evidence of gastric mucosa or gastric body glands in MD is a common occurrence. Bleeding and inflammatory complications of MD are usually related to the ectopic gastric mucosa. Production of acid by ectopic gastric tissue can lead to ulceration, usually seen at the base of the diverticulum at the junction of ectopic gastric mucosa and normal ileal mucosa. [8] The presence of pancreatic tissue mentioned as above is a rarer occurrence and is usually an incidental finding. It was first reported by Zenker in 1861[2]. Ectopic pancreas can show any of the following histological features: pancreatic acinar formation, duct development, and islets of Langerhans, occurring individually or in combination. The presence of ectopic pancreatic tissue in MD may act as a lead point of intussception and can cause intestinal obstruction.[2,9]. Thus, the incidence of ectopic tissue in MD is relatively common but the presence of both ectopic pancreatic and gastric tissue is a very rare phenomenon with incidence varying between 0.8-2.6 %.[1,10]

Many hypothesis have been proposed to explained the presence of ectopic tissues. The most widely accepted theory proposes that various ectopic tissue within MD arise from the pluripotent cells that once lined omphalomesenteric duct. However, this theory is unable to explain the strong preponderance for finding ectopic gastric or pancreatic tissues within MD. It is still unknown why pluripotent cells of omphalomesenteric duct commonly differentiate into one type of tissue over another. According to other reports, during embryological development, due to migration and fusion of ventral and dorsal pancreatic

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duct, some pancreatic tissue may get displaced forming ectopic pancreatic tissue. Improper molecular signaling throughout GIT with loss of sonic Hedgehog gene might also be responsible for ectopic pancreatic tissue.[2]

The symptoms seen in MD are mostly due to the presence of these ectopic tissues and might lead to early diagnosis. As in present case the symptoms of intestinal obstruction could be due to ectopic pancreatic tissue. However, as most cases of MD are clinically silent, preoperative diagnosis of MD with ectopic tissues is quite challenging. We report the given case due to its rare finding of both ectopic gastric and pancreatic tissue in a MD.

Conclusion:

MD is the most common congenital anomaly of GIT whereas MD with both ectopic gastric and pancreatic tissue is a very rare clinical entity. Histopathological examination remains the cornerstone for the definitive diagnosis of MD and confirming the presence of ectopic tissues.

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