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RESEARCH ARTICLE

MID ILEAL DUPLICATION CYST WITH ECTOPIC GASTRIC MUCOSA DETECTED BY TECHNETIUM-99M PERTECHNETATE

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Abstract

Gastrointestinal duplication cysts are a rare congenital malformation in the gastrointestinal tract, most commonly seen in the ilium. The present study reported a child with a mid ileal duplication cyst ofthe ectopic gastric mucosa that was diagnosed by Technetium-99m pertechnetate single-photon emission computed tomography-computed tomography (SPECT-CT) scintigraphy. Gastrointestinal duplication cysts can present with massive lower gastrointestinal bleeding in early childhood; Technetium-99m pertechnetate (Meckel scan) with SPECT-CT can help reach the diagnosis and decrease morbidity and mortality.

Introduction:-

Gastrointestinal tract duplication cysts are a rare congenital malformation, with 33 % of cases primarily seen in the ilium [1]. They are usually seen in the first years of life. The clinical presentation and imaging findings are highly different according to the size, location, ectopic mucosa types, and the presence of complications [1]. The Technetium-99m pertechnetate(Meckel scan) is the most helpful diagnostic method that used to detect heterotopic gastric mucosa without exploratory laparotomy[2,3].

Case Presentation

Two years old Saudi female patient presented with a history of hematochezia. She was referred to the nuclear medicine department in order to rule out the Mackle diverticulum for technetium-99m pertechnetates (Meckel scan). Following the administration of 100 Mbq (2.7 mCi) of technetium-99m pertechnetate, the dynamic abdominal scintigraphy was performed over 45 minutes. The results showed a focal area of high radio-tracer uptake in the left mid abdomen (Left lumbar region) that is simultaneous with the stomach uptake **(Figure 1)**.

To further characterize this abnormal uptake in the left mid abdomen (Left lumbar region), technetium-99m pertechnetate SPECT-CT scintigraphy was done and characterized this abnormality by dilated bowel loops at a mid-ilium **(Figure 2 and 3)**; indicative of gastrointestinal duplication cyst with an ectopic gastric mucosa.

Exploratory laparotomy was performed and a 90 cm tubular duplication cyst was resected from the mid ileal loop.Following the surgery, the patient had a a good initial improvementand has been discharged home

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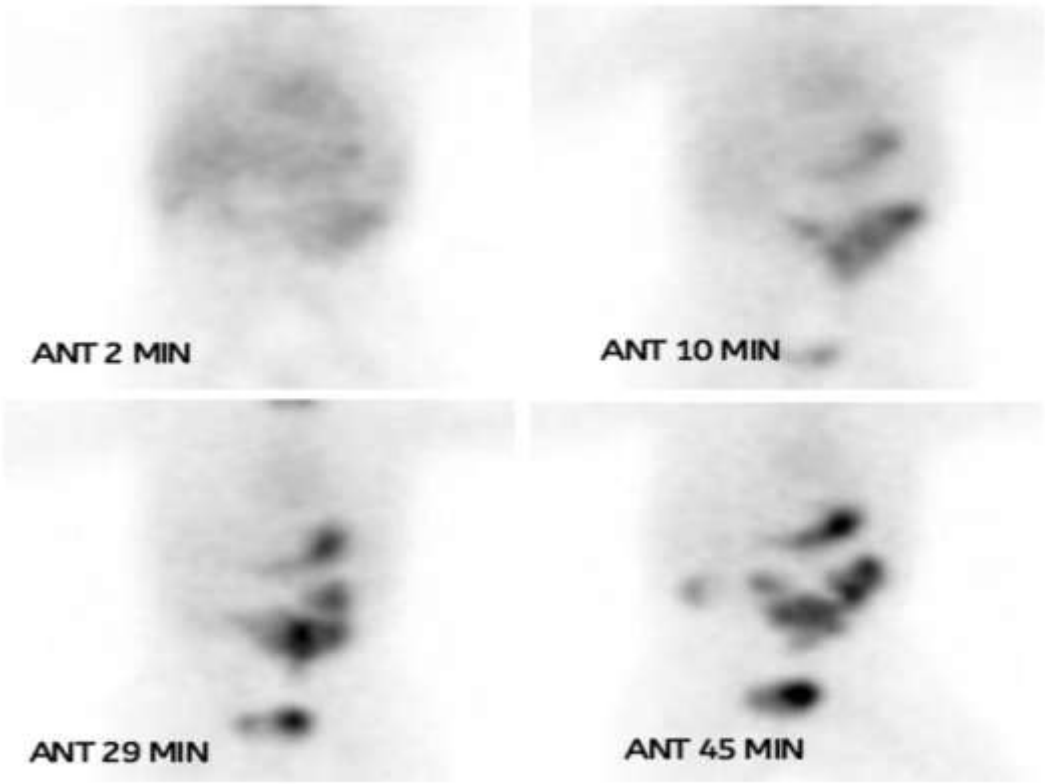

Figure 1:- Technetium-99m pertechnetate showing increased radiotracer uptake in the left mid abdomen simultaneously with stomach uptake on planer imaging.

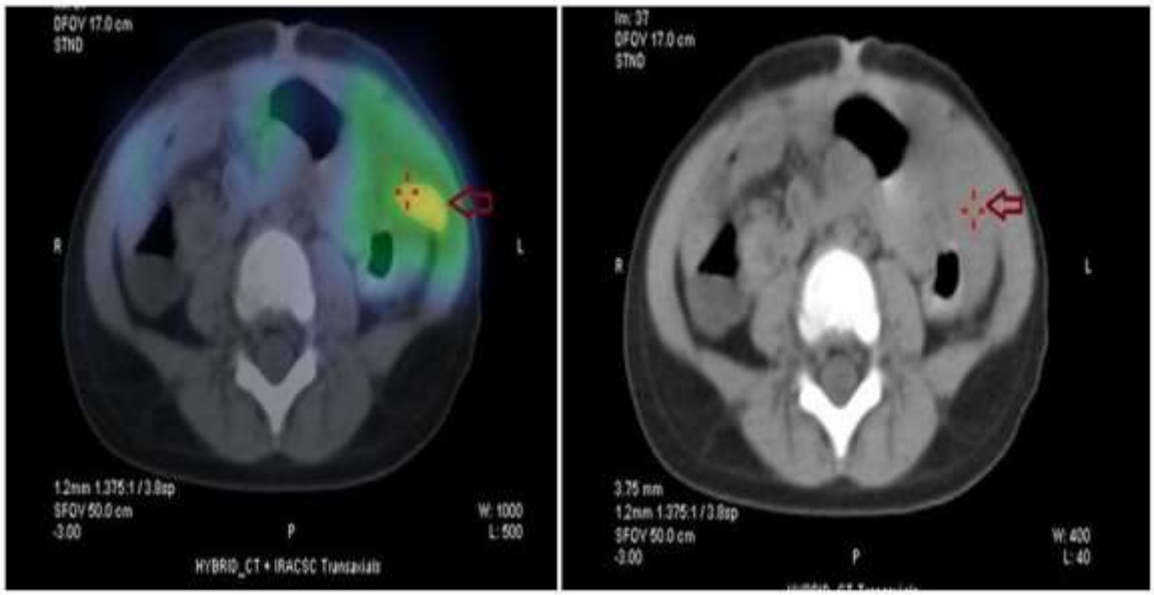

Figure 2:- Axial Technetium-99m pertechnetate with SPECT-CT images shows increased activity in dilated gut loops in the left mid-abdomen at a mid ilium (arrows) simultaneously with that of the stomach uptake, indicative of ectopic gastric mucosa.

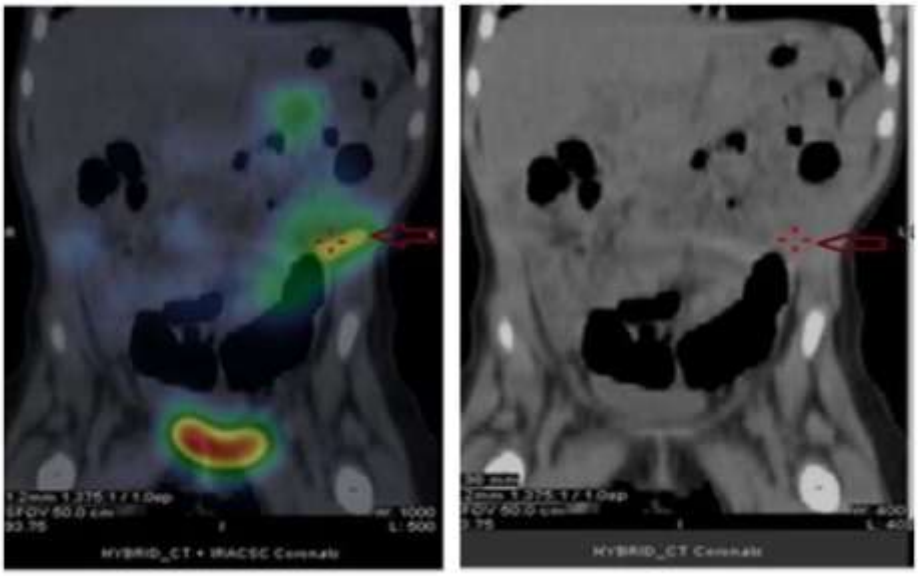

Figure 3:- Coronal Technetium-99m pertechnetate with SPECT-CT images shows increased activity in dilated gut loops in the left mid-abdomen at a mid ilium (arrows) simultaneously with that of the stomach uptake, indicative of ectopic gastric mucosa.

Discussion:-

Gastrointestinal tract duplication cysts are rare congenital malformations most commonly occur before two years of age with unclear etiology [4]. It can be single or multiple and appear anywhere in the gastrointestinal tract on the mesenteric border; most commonly seen in the ilium (33%), esophagus (20%), colon (13%), jejunum (10%), stomach (7%) and duodenum (5%)[5,6]. The association with multiple congenital anomalies was reported in several cases [6].The age of the present case was two years, and the duplication cyst's location was in the ilium, considered the most frequent location.

Clinically, the clinical features of the gastrointestinal duplication cyst vary depending on size, mucosal pattern, and location[6]. The patient may be symptomatic or asymptomatic. The symptomatic patients presented with a history of abdominal pain, abdominal distension, nausea, vomiting, and palpable abdominal mass [1,6]. Symptoms that indicate complications were reported in previous studies[6], for instance: bowel obstruction, perforation, volvulus, intussusception, and malignant transformation. The presenting symptom for our case was hematochezia.

Gastrointestinal duplication cysts are classified into subtypes[7]: saccular (Spherical), tubular, and small intramural cysts. The most common type is saccular, usually asymptomatic, and does not communicate with the bowel lumen. On the contrary, the tubular type is most commonly seen in the colon and could be associated with a genitourinary defect [7]. The last type of gastrointestinal duplication cyst is an intramural cyst that is usually seen near or at the ileocecal valve and may cause bowel obstruction [7].

The presence of heterotopic gastric mucosa in gastrointestinal duplication cyst is variable (17-36%)[3]. The length of the gastrointestinal duplication cysts ranges from a few to multiple centimeters.

In the context of diagnosis, the ultrasound with an appearance of a double-wall sign and positive peristalsis is frequently used as an initial imaging modality to diagnose gastrointestinal duplication cysts [6]. Although computed tomography (CT) and magnetic resonance imaging (MRI) are not usually used for diagnosis, they can be helped to evaluate the size, location, extensions of the cyst, mass effect on the adjacent structures, and any complications [1,6]. However, the Technitium-99m pertechnetatate (Meckel scan) is the gold standard tool for diagnosis that has a sensitivity of 75% [3]. It helps to detect heterotopic gastric mucosa in preoperative diagnosis, especially for pediatric patients with an unknown cause of lower gastrointestinal bleeding [2,5]. Furthermore, the SPECT-CT imaging aims to improve diagnosis by localization of the tracer activity in the ectopic gastric mucosa with a decrease in activity over time due to dilution of the tracer from intestinal secretion [3]. Technetium-99m pertechnetatewas used as a

diagnostic method for the present case, andit was revealed high radiotracer uptake in the left mid abdomen that was similar to the stomach uptake.

There are multiple differential diagnoses of the false-positive uptake of the technetium 99m-pertechnetate [1], including intussusception, inflammatory bowel disease, retention of tracer in the urinary collecting system, other cause of gastrointestinal bleeding, and vascular lesions like arteriovenous malformation and haemangioma; however correlation with the SPECT-CT help to reach the final diagnosis and excluding the false-positive causes. SPECT-CT was performed in the present case and confirmed the increased activity in dilated gut loops in the left mid-abdomen at a mid ilium (arrows) simultaneously with that of the stomach uptake.The management includes surgical resection of the gastrointestinal duplication cysts and adjacent bowel loops in symptomatic and asymptomatic patients to avoid future complications[5].

Conclusion:-

Technetium-99m pertechnetate (Meckel scan) SPECT-CT scintigraphy is the best modality to evaluate lower gastrointestinal bleeding in early childhood. The physicians should be aware of a rare entity like a gastrointestinal duplication cyst with an ectopic gastric mucosa. Early detection of the gastrointestinal duplication cyst can help to decrease morbidity and mortality.

Ethical approval:

Ethical approval is not required in our institution to publish a case report.

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