

Significance Of "Pseudokidney" Sign On Ultrasonography In A G.I.T. Mass And Correlation With Barium Study

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The objective of this study was to assess the role of ultrasonography in the investigation of clinically suspected neoplasm of the hollow organs of the GI tract, and significance of the "Pseudokidney" sign and to confirm the diagnosis by barium studies and/or endoscopy, including a definite histological diagnosis. A series of 20 patients of different age groups ranging from 8 to 70 years presenting with a clinically suspected GI tract mass were examined by ultrasonography and the findings correlated with barium study. A 'pseudokidney' sign was seen in 18/20(90%) patients. Ultrasonography correctly identified the organ of origin and was able to guide the patients's further management. The barium studies confirmed the ultrasonographic findings. In 2/20(10%) patients abnormality was found in right iliac fossa and showed matted bowel loops, barium enema examination confirmed the diagnosis of ileo-caecal tuberculosis in these two patients. It is concluded that ultrasonography should be the imaging modality of first choice in patients presenting with a gastrointestinal mass.

Key Words: Ultrasonography, Pseudokidney, GIT Masses Barium Studies.

The patients presenting with an abdominal mass related to hollow organs of GI tract are a diagnostic problem. Many lesions can produce "Pseudokidney" appearance (Table I). The objective of this study was to assess the role of ultrasonography in their investigation. In the normal person the maximum bowel wall thickness is 3mm, when distended and 5mm when non distended. Normal colonic thickness of up to 9mm and gastric thickness of up to 7mm have been recorded.^{1,2} Alterations in bowel wall thickness are detectable on ultrasound. It is more or less agreed that a bowel wall thickness of greater than 5 mm that does not change, either with peristalsis or with direct compression by the transducer, is abnormal.³ The degree of bowel wall thickening depends upon the degree of infiltration of the bowel wall by abnormal tissue.⁴

Table I: Lesions Producing "pseudokidney" appearance

Neoplasms	
1.	Adenocarcinoma
2.	Lymphoma
3.	Leiomyosarcoma
4.	Carcinoid
Inflammatory and granulomatous diseases.	
1.	Appendicitis and Appendicular Mass
2.	Gastritis
3.	Tuberculosis
4.	Crohn's disease
5.	Diverticulitis
Others	
1.	Infantile hypertrophic pyloric stenosis
2.	Intussusception
3.	Intramural haematoma
4.	Ischaemia
5.	Menetriers disease
6.	Anyloidosis
7.	Whipples disease

The pattern of bowel involvement by any process which produces thickening is characteristic and described as the "pseudokidney", "target", "bull's-eye", "cockade", or "ring sign".⁵ This pattern is not specific for any particular bowel

pathology and may be seen in both inflammatory and neoplastic processes within the bowel. The characteristic "echogenic core" likened to the collecting system of kidney is due to collapsed mucosa and gut contents and sonolucent rim likened to the renal parenchyma represents extrinsic tumour that has infiltrated the bowel wall circumferentially.

Materials And Methods

This study was carried out on patients who presented at the Radiology Department, Mayo Hospital Lahore. Between 15th July -15th September 94. The patients were referred from the Medical and Surgical units of Mayo Hospital with the clinically suspected GIT mass. Twenty patients of different age groups and of both sexes were studied. The clinical diagnosis was made by the symptoms of abdominal mass, fever, dysphagia, anorexia, weight loss, change in bowel habits and bleeding per rectum.

Ultrasonography

In these patients ultrasound was the first diagnostic technique employed.

Real time transabdominal ultrasonography with 3.5 MHZ sector, convex and linear probes were used in different patients and positive findings were recorded on thermal sonoprinter.

Barium Study

Barium swallow, double contrast barium meal, barium follow through and double contrast barium enema (DCBE) were carried out on to confirm/correlate the ultrasound findings.

Endoscopy

Esophagoscopy, gastroscopy and colonoscopy was carried out in selected patients.

Histopathology

Resected segments of involved bowel were studied for their histopathology.

Results

In most patients i.e. 18/20 (90%) correct diagnosis was possible on ultrasonography by demonstrating the

"pseudokidney" sign and it correlated with the clinical history and site of lesion. In Fig I (a,b) II (a,b) III(a,b) IV(a,b) In (Table II) remaining two patients (10%) pseudokidney sign was not demonstrated but instead showed matted bowel loops in right iliac fossa and subsequently diagnosis was made on barium enema examination as ileo-caecal tuberculosis.

TABLE II Ultrasound findings demonstrating "pseudokidney" sign

Nature of lesion	n
a) Upper GIT	
Esophageal Neoplasm (lower end of esophagus)	2
Gastric Neoplasm	1
Tuberculosis	4
Appendicular Mass	3
Crohn's disease	1
b) Lower GIT	
Colonic Neoplasm	5
Rectal Neoplasm	2

The barium study confirmed the ultrasonographic findings in all these patients except in appendicular mass where it was not carried out.

Discussion

Transabdominal ultrasonography has been considered as very important and has proved to diagnose correctly the most of patients presenting with abdominal mass related to hollow organs of GI tract. Certain sites allow more exact delineation, particularly after administration of fluid.⁶ The ultrasonographic findings are correlated with barium study and it is concluded that it is almost as good as barium study. Moreover it has the advantage of being non-invasive, rapid, safe, easily available and cheap. It is also helpful in demonstrating the hepatic, adrenal and nodal metastases.⁷

The question "is it possible to differentiate between inflammatory and neoplastic causes? In author's opinion it is possible with the help of clinical history, age of the patient, duration of the symptoms and site of lesion. Moreover as a general rule inflammatory lesions involves a long segment of affected bowel.⁸ For example a young patient presenting with the history of fever, anorexia, weight loss and mass in right iliac fossa is likely to be a ileo-caecal tuberculosis.⁹

New imaging modality like endoscopic ultrasound (EUS) demonstrate the alternating layers of the mucosa, submucosa and muscular layer of the bowel. It is said that these layers are retained in inflammatory thickening but not retained in tumour¹⁰

Other imaging modalities used in the diagnosis of a GIT mass are computed tomography (CT) and magnetic resonance imaging (MRI). But again the cost and non availability of these modalities makes ultrasonography as the first choice.

Conclusion

It is concluded that ultrasonography should be the imaging modality of first choice in patients presenting with a gastrointestinal mass. In certain age groups such as the very old, it may obviate the need for more invasive procedures in conditions such as tumours of the large bowel.

The site of involved bowel may be inferred by the relative position of lesion in the abdomen. Thus a pseudokidney sign demonstrated in epigastrium is likely to be pathology in the lower end of esophagus and stomach; in the right upper quadrant, the hepatic flexure; left upper quadrant, the splenic flexure; right iliac fossa; the ileo-caecal; and in the pelvis; sigmoid colon and rectum.

Certain sites allow more exact delineation, particularly after the administration of fluid. For example oral administration of fluid indicates the confirmation of a gastric or duodenal mass and administration of fluid via the rectum indicates the location of lesion in rectum and sigmoid colon.

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