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Role of Ultrasonography in the Diagnosis of Infantile Hypertrophic Pyloric Stenosis

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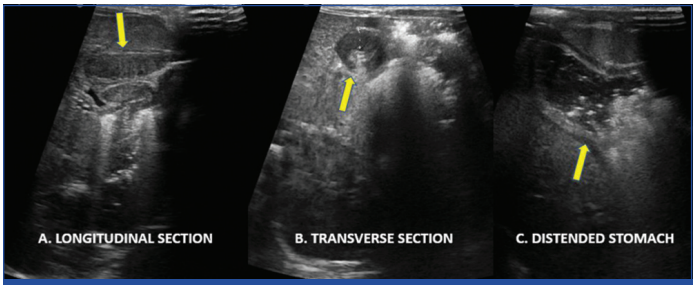
A 28-day-old male baby was brought by his mother with complaints of projectile non bilious vomitings after feeds, excessive crying, and decreased frequency of stools for three days. The baby was born at full-term by normal vaginal delivery to a primigravida. There was no history of fever/Neonatal Intensive Care Unit (NICU) admission/any significant complication at birth. The family history was unremarkable. The laboratory investigations were within normal limits with no alkalosis or hyperbilirubinaemia. The baby was referred to the department of radiology for Ultrasonography (USG). USG showed lengthening of the pyloric canal (measuring 21 mm in length) and thickened hypoechoic pyloric muscle (measuring approximately 5.4 mm in thickness), giving the classic cervix sign on the longitudinal section [Table/Fig-1a] and target of doughnut sign on transverse section [Table/Fig-1b]. A distended stomach was seen proximal to the pylorus [Table/Fig-1c]. These USG features fulfil the criteria for the diagnosis of Infantile Hypertrophic Pyloric Stenosis (IHPS). The diagnosis was confirmed during surgery.



[Table/Fig-1]: a) Gray scale B-mode USG image showing longitudinal section of pyloric canal (shown by the arrow) depicting cervix sign with thickened hypoechoic pyloric muscle and elongated pyloric canal. b) Gray scale B-mode USG image showing a transverse section of pylorus (shown by the arrow) depicting classic target sign/Doughnut sign of thickened pyloric muscle. c) Gray scale B-mode USG image showing distended stomach (shown by the arrow) proximal to the pyloric canal.

DISCUSSION

Infantile Hypertrophic Pyloric Stenosis (IHPS) is one of the common surgical conditions in the initial few months (typically between the second to sixth weeks) of postnatal life that presents classically with projectile non bilious vomitings, that occur after feeds or intermittently and failure to gain weight [1]. On clinical examination, the infant is normal at birth. This condition has an incidence of two to five in 1000 live births with male preponderance (M:F=4:1) and varying incidence among different ethnic groups, being more common in whites and less common in India [1]. The aetiology of the condition remains unknown, but a greater than five-fold increase of risk in first-degree relatives suggests a familial link [1]. The condition characteristically shows an elongated pyloric canal and thickened pyloric muscle that cannot relax, causing gastric outlet obstruction. Late clinical manifestations include dehydration, weight loss, jaundice, visible peristalsis, and a palpable olive-shaped lump in the epigastric region [2].

The USG criteria for IHPS include pyloric muscle thickness of >3 mm and pyloric canal length of >15 mm (>12 to 19 mm in different studies), and additional findings of proximally distended stomach showing active peristalsis, and redundant hyperechoic mucosa [2,3]. USG is a widely available non invasive imaging modality that can detect IHPS promptly after early clinical symptoms, and prevent delays in diagnosis until the late clinical manifestations (which make the infant a less suitable candidate for surgical procedures) develop. It also has the added advantage of being a dynamic study that can demonstrate the behaviour of the pyloric canal/muscle in real time [2]. The sensitivity of USG is operator dependent; however, when done by an experienced person, its sensitivity and specificity are high [3], obviating the need for radiography or barium studies and avoiding unwanted radiation to the newborn.

Differential diagnosis consists of infantile pylorospasm, gastroenteritis, and gastroesophageal reflux which are initially difficult to distinguish clinically, however, USG is the imaging modality of choice for IHPS. In doubtful cases, upper gastrointestinal barium studies can demonstrate string sign or double track sign in cases of IHPS [4]. Management includes primarily surgical management with pyloromyotomy (Ramstedt's pyloromyotomy) and supportive management [5].

CONCLUSION(S)

The present case showed the classic ultrasonographic signs and fulfilled the ultrasonographic diagnostic criteria for IHPS, obviating the need for further investigations and facilitated prompt treatment of the baby.

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