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# An unusual case of transverse mesocolic internal hernia with abnormality of both hands and high arched feet

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ABSTRACT

*INTRODUCTION:* An internal abdominal herniation is the protrusion of a viscus through a normal or abnormal mesenteric or peritoneal aperture. It is a rare cause of small bowel obstruction with a reported incidence of 0.2–0.9%. It can either be acquired through a trauma or surgical procedure or can be related to congenital peritoneal defects. Herniation through transverse mesocolon is very rare.
*PRESENTATION OF CASE:* A case of acute intestinal obstruction due to internal herniation through a congenital rent in transverse mesocolon with rotation of gut approximately 180° around axis of the band. Patient also had bilateral hypoplastic thenar muscles with rudimentary 1st metacarpals and high arched feet. Reduction along with derotation of gut, with closure of the rent in transverse mesocolon and fixation of the caecum to lateral peritoneum was performed.
*DISCUSSION:* The preoperative diagnosis of mesenteric defect is difficult because of wide range of acute abdominal symptoms, and there are no specific radiographic findings. CT is the most important diagnostic tool is, with 77% accuracy in such cases. Due to the risk of strangulation of the hernial contents, even small internal hernias are dangerous and may be lethal.
*CONCLUSION:* Internal hernia should be suspected in patients with signs and symptoms of intestinal obstruction, particularly in the absence of inflammatory intestinal diseases, external hernia or previous laparotomy. Surgical decision-making is on the basis of clinical findings of intestinal strangulation or ischemia, and emergency laparotomy should be performed without preoperative diagnosis of such a rare disease.
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## 1. Introduction

Internal hernia is a rare cause of small bowel obstruction with a reported incidence of 0.2–0.9%.[1–5] It leads to 0.5–4.1% of the cases of acute intestinal obstruction caused by hernias.[2] It may be either congenital or acquired.[3] These herniations may be persistent or intermittent. Paraduodenal hernias are the most common type of internal abdominal hernias, accounting for over one-half of reported cases.[2] Less common types include mesocolic (transmesenteric) hernia, which occurs following abdominal surgery.[3]

Mesenteric defect can present with intestinal obstruction and cause incarceration or strangulation.[4] Though rare, it should be considered as one of the differential diagnosis in a relatively young patient with bowel obstruction without external hernia or no previous history of any abdominal surgery.[2,4] Key to its successful operative management is timely intervention and to safeguard the important vascular structures like superior mesenteric and inferior mesenteric vessels, etc. which course through the neck of these hernias with resultant effect on gut.[1]

## 2. Case report

A 14-year old male patient presented to emergency department of our hospital with abdominal pain in periumblical area since 4 days which developed few hours after picking up a sack of wheat, associated with vomiting and abdominal distension with history of not passing flatus since 3 days and passing mucoid stools (2–3 episodes/day). Patient has no other significant past surgical/medical illness.

On examination, patient had tachycardia with BP 116/76 mm Hg. Abdomen was distended and tense with diffuse tenderness and absent bowel sounds. Examination also revealed hypoplastic thenar muscles and hypoplastic thumbs of both hands (Fig. 5a) and also had high arched feet (Fig. 5c). X-ray abdomen revealed dilated gut loops with air fluid interface. X-ray bilateral hands revealed only distal most part of 1st left metacarpal and 1st right metacarpal

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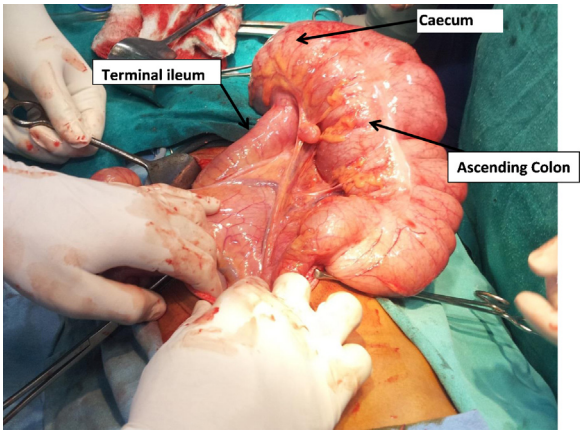


**Fig. 1.** Initial photograph just after opening the abdomen showing distended caecum with ascending colon and terminal ileum.

relatively longer than normal with paucity of soft tissues and absence of normal convexities in the bilateral thenar compartment (Fig. 5b). Ultrasound abdomen showed fluid distended dilated small gut loops measuring about 6 cm in diameter with sluggish peristalsis in lower abdomen. After routine blood investigations and fluid resuscitation, emergency exploratory laparotomy through midline incision was done. It revealed hemorrhagic peritoneal fluid with distended caecum and ascending colon (Fig. 1) which has internally rotated along with ileum and jejunum through a defect in transverse mesocolon and rotated approximately 180° around axis of the band, forming constriction ring just distal to hepatic flexure through lesser sac to the right side of the abdomen almost to its anatomical position anteriorly to band causing massive dilatation of the caecum and ascending colon, which were mobile (because of closed loop obstruction with competent ileocaecal valve) and mild dilatation of the terminal ileum (Figs. 2–4).

There was no other malrotation of gut as evident by normal location of the duodeno-jejunal and ileocecal junctions. Band was divided and herniated gut was reduced through the defect and derotation done along with. No evidence of gangrene/strangulation

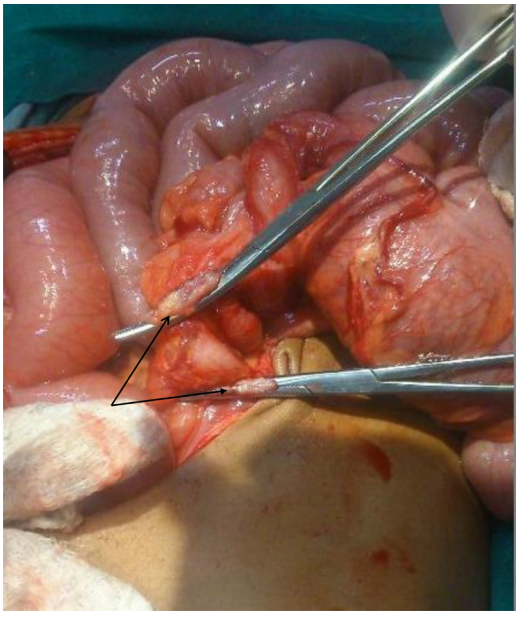

**Fig. 2.** Showing divided band (marked by arrows).

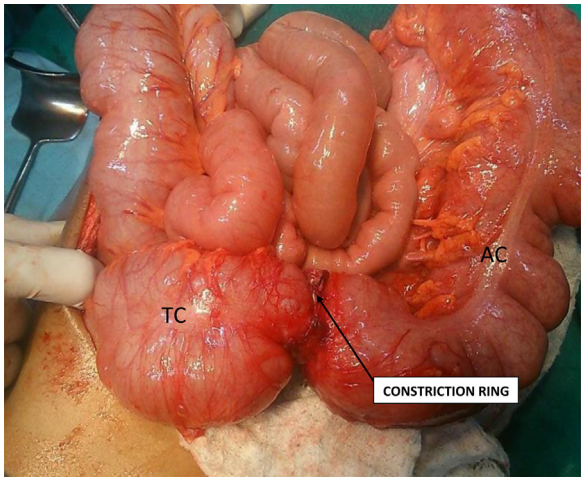


**Fig. 3.** After division of band showing the constriction ring. AC – Ascending Colon;TC – Transverse Colon.

was present. Manual decompression of gut was done distally. Ascending colon, caecum and small gut loops were reposited back to its anatomical position. Defect in the transverse mesocolon which was about 10 cm in width was closed with silk 2–0. A small serosal defect which was present over caecum was closed by applying lembert sutures with 3–0 vicryl. Caecum was fixed to the lateral peritoneum. Abdomen was closed, after achieving haemostasis and proper peritoneal toileting, in layers over a drain. Appropriate antibiotics were started. Post operatively patient was discharged on 11th day in satisfactory condition. Patient reported back 12 days later with features of sub-acute intestinal obstruction which was managed conservatively and on subsequent follow up patient remained asymptomatic.

## 3. Discussion

Internal hernias are defined as herniation of a viscus, usually the small bowel, through a normal or abnormal orifice within the peritoneal cavity.[2,3] The orifice may be normal (Winslow's foramen) or paranormal (e.g. hernias through the peritoneal fossa may be paraduodenal, ileocecal, inter- or meso-sigmoidal, paracolic, supravesical, or of the large ligament of the uterus). All these hernias possess a sac and are true hernias. The orifice may be

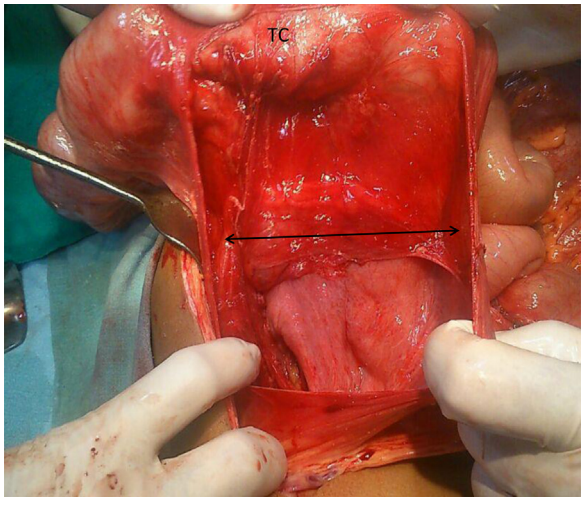


**Fig. 4.** Showing about 10 cm defect in the transverse mesocolon shown by arrow. TC – Transverse Colon.


**Fig. 5.** (a) Showing hypoplastic thenar eminences and hypoplastic thumb of both hands. (b) X-ray bilateral hands revealing only distal most part of 1st left metacarpal and 1st right metacarpal relatively longer than normal with paucity of soft tissues of bilateral thenar compartments. (c) Showing bilateral high arched feet.

abnormal, and if of pathologic origin, may be formed in a mesentery or an omentum, thus potentially leading to the following types of hernia: trans-mesenteric, trans-mesocolic, trans-omental, or hernia by colo-omental disinsertion. An abnormal orifice may also occur in a congenital anomaly of a ligament (falciform ligament) or mesentery (mesentery of Meckel's diverticulum). All of the aforementioned, abnormal hernias lack a sac and are "internal prolapses".[5] Transmesenteric hernias have been described after surgical procedures such as gastric bypass surgery in which a Roux-en-Y loop is constructed that predisposes the development of internal hernia.[2]

The causes of forming mesentery defect still remain uncertain. A few hypotheses have been reported. FEDERSCHMIDT stated that the defects represented a partial regression of the dorsal mesentery in the human being, MENEGAUX postulated that fenestration occurred during the developmental enlargement of an inadequately vascularized area, JUDD, KIEBEL and MALL believed that because the greater part of the gut is displaced from the abdominal cavity into the umbilical cord in fetal life, considerable pressure might cause the colon to continue along the path of least resistance and gradually force its way through the delicate structure of the mesentery,[7] Malitet al. have

suggested that isolated mesenteric defect represent a forme fruste (an atypical, especially a mild or incomplete form) of intestinal atresia.[4]

When the small bowel is herniated through a defect in the mesentery or omentum, the herniated bowel is compressed against the abdominal wall. The herniated bowel tends to appear clustered and lies outside the colon, a reversal of the normal anatomic arrangement. As a result, the adjacent colon is displaced centrally. There will be some degree of compression, crowding, displacement and obstruction of both the bowel and blood vessels. The herniated bowel may also twist within the hernial sac, which results in volvulus and a predisposition to bowel ischemia.[3]

The preoperative diagnosis of mesenteric defect is difficult because of wide range of acute abdominal symptoms, and there are no specific radiographic findings.[4] The most important diagnostic tool is CT, which is accurate in 77% of the cases.[3] Ultrasonography and Computed Tomo-graphy are helpful with observation of a sac like mass or cluster of dilated small bowel loops at an abnormal anatomic location [1]with classical signs on CT Scan shows: 'Whirlpool sign', crowding of bowel loops in the upper compartment and the absence of caecum from the Right Iliac Fossa. Barium studies and CT examination of these hernias may also show the point of transition where the bowel loops enter or exit the orifice. Angiography reveals an altered course of jejunal vessels as they course along the herniated portion of the bowel.[3] However, there are no confirmatory findings for mesenteric defect.

Due to the risk of strangulation of the hernial contents, even small internal hernias are dangerous and may be lethal.[2,3] Treatment consists of reduction of hernia by gentle traction and closure of the defect with care not to injure the vessels near the hernial sac margin.[3] Usually, the obstructive point is the edge of the defect and in enlarging the opening to permit reduction of the contents care has to be taken to avoid damage to the inferior mesenteric vessels and ascending left colic artery (in left paraduodenal hernia), superior mesenteric artery (in right paraduodenal hernia) and portal triad (in foramen of Winslow hernia).[1,6]

In our case, patient had congenital long mesentry with freely mobile caecum and ascending colon as patient also had congenital rudimentary metacarpals with hypoplastic thenar muscles and high arched feet and a large congenital defect in transverse mesocolon. This resulted in herniation of the ascending colon, caecum alongwith ileum and jejunal loops through a rent in transverse mesocolon with rotation of gut loops at axis formed by the band and lifting of heavy weight had resulted in herniation because of increased intra-abdominal pressure as is evident from the history given by the patient that he became symptomatic after lifting the weight. Acute presentation of the patient led to emergency exploratory laparotomy.

A case have been reported by Alaker et al. of internal herniation through a congenital defect in the transverse colon through which have herniated the terminal ileum, caecum and the proximal half of the ascending colon. They have furthermore rotated 360° about the axis of the pedicle forming a volvulus.[8]

## 4. Conclusion

Internal hernia should be suspected in patients with signs and symptoms of intestinal obstruction, particularly in the absence of inflammatory intestinal diseases, external hernia or previous laparotomy. Surgical decision-making is on the basis of clinical findings of intestinal strangulation or ischemia, and emergency laparotomy should be performed without preoperative diagnosis of such a rare disease. When mesenteric defect is incidentally detected during unrelated abdominal surgery, the defect should be closed to prevent it from causing internal hernia in future.[4]

## Conflict of interest

There is no conflict of interest among all the authors.

## Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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## Authors's contributions

The conception and design of the study – Paras K. Pandove[a]

Acquisition of data – Ashish Moudgil, Amarbir Singh[a]

Analysis and interpretation of data – Paras K. Pandove[a], Ashish Moudgil, Amarbir Singh[a]

Drafting the article – Ashish Moudgil, Megha Pandove[a], Divya Sharda[b]

Revising it critically for important intellectual content – Paras K. Pandove[a], Vijay K. Sharda[a]

Final approval of the version to be submitted – Vijay K. Sharda[a]

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