

Malrotation of the midgut in laparoscopic Roux-en-Y gastric bypass

Dilip Dan MBBS FACS, Nigel Bascombe MBBS, Dave Harnanan MBBS, Seetharaman Hariharan MD FCCM, Vijay Naraynsingh MBBS FRCS

Department of Clinical Surgical Sciences, St. Augustine San Fernando General Hospital, The University of the West Indies, Trinidad, West Indies

Correspondence author: Dilip Dan, Email: dilipdan5@gmail.com

【Abstract】 Malrotation of the midgut is a congenital anomaly resulting from abnormal rotation of the primitive midgut during embryonic development. The prevalence of this entity is difficult to ascertain because some patients remain asymptomatic and the condition may be diagnosed incidentally during radiological investigations or surgical procedures. The case of asymptomatic intestinal malrotation reported here was discovered in a morbidly obese adult during a Laparoscopic Roux en Y gastric bypass (LRYGB) and successfully completed the procedure. Laparoscopic surgeons need to be mindful of the possibility of such anomalies during bowel surgery. Routine appendectomy should be considered as a useful addition to LRYGB in these patients.

【Key words】

【摘要】 中肠旋转不良是在胚胎发育过程中原始中肠异常旋转导致的先天性畸形。由于部分中肠旋转不良的患者可长期无症状,往往是在影像学检查或外科手术中意外发现,因此该病的患病率难以明确。本文报道了 1 例在腹腔镜 Roux-en-Y 胃旁路手术(LRYGB)意外发现的成人中肠扭转病例。经过在术中认真制定手术计划,手术得以顺利完成,术中出血量极少,手术用时 3.17 h,术后恢复良好,未出现术后并发症。此类意外发现的中肠扭转可能给疾病诊断以及手术操作带来一定的挑战性,在腹腔镜肠道手术中应注意对此类畸形的应对,阑尾切除术或可使患者受益。

【关键词】

Midgut malrotation though commonly encountered in paediatric surgical practice, is relatively uncommon in adults. There may be asymptomatic patients with midgut malrotation who may pass their entire life time without being diagnosed making the true prevalence of this congenital anomaly difficult to ascertain. To our knowledge there has been reported incidence of incidental finding of midgut malrotation in adults. We report such a case of midgut malrotation in an adult, which was encountered incidentally

during a laparoscopic Roux-en-Y gastric bypass (LRYGB) in a morbidly obese patient. With careful measures, the procedure was completed laparoscopically without any post operative complications. When midgut malrotation is discovered unexpectedly, especially during a complex laparoscopic procedure, it poses significant challenges.

Case report

A 37 year old morbidly obese male, presented with complaints of severe lower back pain and difficulty to lose weight despite changes in dietary habits and exercise. He was also noted to be suffering from significant sleep apnea. On clinical

examination, his body weight was 140 kg and his Body Mass Index (BMI) was > 65 and hence he was diagnosed to be suffering from super-obesity. Cardiopulmonary as well as endocrine evaluations were normal. He was referred to the dietician and psychiatrist for counseling before being scheduled for bariatric surgery. He did not undergo an upper gastrointestinal endoscopy.

After thorough pre-operative assessment, the patient was scheduled for a LRYGB procedure using 6 ports. Unfractionated heparin 5000 i.u., subcutaneously and intermittent pneumatic leg compressions were used for deep vein thrombosis prophylaxis. Antibiotic prophylaxis was given on induction of anesthesia.

The restrictive component of the procedure was executed without difficulty. This involved creating a 20 cc gastric pouch using 3.5 mm staples (45 mm endoGIA ETHICON™) (Johnson & Johnson, USA). The next step usually consists of identifying the duodeno-jejunal (DJ) flexure after lifting the transverse mesocolon. This could not be located in the usual anatomical region. The caecum and appendix were located at this site instead with a significant amount of small intestine located in the right upper quadrant. The estimated location of the DJ flexure was found by running the small intestine from the ileocaecal junction proximally to the jejunum and also from the 1st part of the duodenum to the jejunum, where Ladd bands were found. An additional port was required in the right upper quadrant to manipulate the small intestine. Once the DJ flexure was identified, with the ligament of Treitz found to the right of the midline and inferior to the pylorus, the malabsorptive component of the procedure was executed as usual using 2.5 mm staples (45 mm Endo GIA ETHICON™) (Johnson & Johnson, USA). There was no volvulus or narrowing of the small bowel mesentery. Incidental laparoscopic appendectomy was performed and Ladd bands were left intact as found not to be of any significance. The total operative time was 3 hours and 10 minutes and the estimated blood loss was minimal.

The patient had an uneventful post-operative recovery. A gastro-graffin meal and follow through on day 1 post-operatively showed no extravasation of contrast. He continues to lose weight at an acceptable rate and no longer complains of back pains or sleep apnea. At 1 year follow up he has lost over 150 lbs of body weight.

Discussion

Adult patients with midgut malrotation who were not diagnosed during infancy, may present with a variety of chronic symptoms, including nausea, vomiting, diarrhea, vague abdominal pain, early satiety, bloating, dyspepsia and peptic ulcer disease. Some patients are even labeled with functional or psychiatric disorders^[1-3]. There is another subgroup of patients who are truly asymptomatic, as is the case of our patient, and their anomaly is only discovered during radiological investigation or surgical intervention for another purpose. This makes it difficult, if not impossible, to estimate the true incidence of this condition.

Durkin et al did a retrospective analysis on patients diagnosed with intestinal rotation disorders or who underwent a Ladd's procedure over a 4 year period which included 10 adults (age 16 or greater) and 14 children (age less than 16) at University of Wisconsin Hospital^[3]. This analysis shows how common the condition is among adults. All adults in this analysis had chronic gastro-intestinal symptoms. Therefore, if one were to factor in the subgroup of asymptomatic patients which is unknown, this will further increase the adult proportion of midgut malrotation.

According to the literature, the adult with intestinal malrotation presents with pathologies that may or may not be associated with the congenital anomaly. Gilbert et al^[4] reported 3 cases of intestinal malrotation in adults. These patients presented with ileocaecal volvulus, acute appendicitis and stenosing carcinoma of the splenic flexure; highlighting the fact that many cases of malrotation will only be discovered coincidentally, when surgical intervention

is performed for concomitant disease. Cases of midgut malrotation found during LRYGB in the literature are few. Of the reports found, 1 patient was asymptomatic and the other suffered from gastro-esophageal reflux disease^[5,6].

The paucity of reported cases of malrotation encountered during LRYGB does not undermine the importance of this entity to the laparoscopic surgeon. It is absolutely imperative that one has a keen grasp of the embryonic development of the intestines as well as a clear understanding of the variations of intestinal rotation disorders that one may encounter. McVay et al^[7] in their review highlighted the spectrum of abnormalities of intestinal position and fixation ranging from normal to typical malrotation to complete non-rotation and variations in between.

Ladd's procedure is still considered the treatment of choice for patients with midgut malrotation. However, patients with atypical malrotation who are asymptomatic have shown to suffer more post operative complications after Ladd's procedure than with typical malrotation^[7]. Our patient has typical malrotation given that his ligament of Treitz was located to the right of the midline and inferior to the pylorus, and his small intestine was located in the right upper quadrant. Although it is well documented that small bowel volvulus is more common in typical malrotation, hence justifying doing Ladd's procedure in these patients, the decision not to perform a complete Ladd's procedure was taken because the planned procedure, LRYGB, will change the anatomic orientation of the small intestine which may offset the possibility of a volvulus. Also, any possibility of duodenal obstruction is of no significance because

the duodenum is completely bypassed in this procedure. We thought it was important to perform an appendectomy due to the abnormal position of the appendix and the high risk of a diagnostic dilemma if the patient develops appendicitis in the future.

LRYGB can be safely performed in patients with intestinal rotation disorders. However, it is imperative that the surgeon be able to decipher the anatomy and troubleshoot his way through the procedure, finishing with a favourable outcome. If this abnormality is encountered appendectomy should be considered as its pathology may result in clinical diagnostic and surgical difficulties.

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(Received:2010-00-00, Accepted:2010-00-00)