Annals of Clinical and Medical Case Reports

ISSN 2639-8109

Case Report

Superior Mesenteric Artery Syndrome Treated by Laparoscopic Duodenojejunostomy

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Volume 4 Issue 1- 2020

Received Date: 29 Apr 2020

Accepted Date: 08 May 2020

Published Date: 11 May 2020

1. Abstract

Superior Mesenteric Artery syndrome (SMA Sd) is a very rare disease. It is suspected in the case of intestinal obstruction in severely underweight patients. When conservative management fails surgery becomes needed, with laparoscopic duodenojejunostomy being the best approach.

2. Keywords:

Superior Mesenteric Artery; Duodenojejunostomy; Laparoscopy

3. Case report

A 22-year-old patient, with a BMI of 22 kg/m2, presented to us with a history of intestinal obstruction for more than five days, and a severely distended abdomen on physical exam. Abdominal CT Scan confirmed the diagnosis of SMA sd with an aortomesenteric angle of 20 degrees and a distance of 7 mm (Figure 1). He was managed conservatively with nasojejunal feeding, with no relief in his symptoms after five days. Laparoscopic duodenojejunostomy was decided. Under general anesthesia, the patient was positioned in Trendelenbourg decubitus positon and the surgeon standed between his legs. The Camera trocar was placed 2 cm below the umbilicus and the two operating trocars at the midclavicular line bilaterally on the same level. The transverse colon and mesocolon were retracted superiorly till clear vision of the third part of the duodenum (D3) (Figure 2-3). The retroperitoneum is entered by incising the thin peritoneal layer below the middle of D3, the Inferior Vena Cava (IVC) became visualized. (Figure 4) Then, D3 was completely mobilised from the aorta and the IVC posteriorly (Figure 5), and dissected from its junction with the second duodenum (D2) medially (Figure 6), from the Superior Mesenteric Vein (SMV) laterally and from the transverse mesocolon anteriorly (Figure 7). Finally, the proximal Jejunum was anastomosed mechanically to D3 laterolaterally (Figure 8). The post operative course was uneventful. The patient was relieved from his obstructive symptoms and subsequently regained weight.

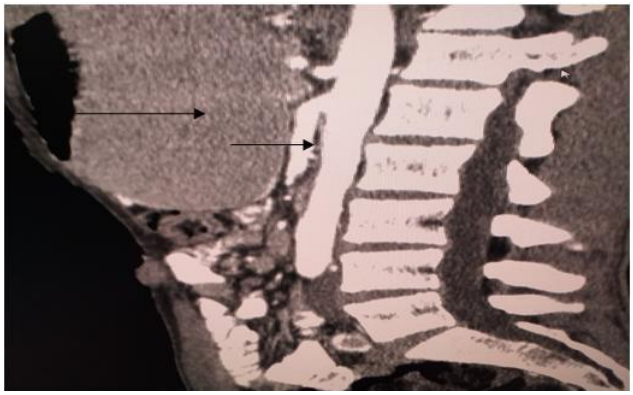

Figure 1: Aortomesenteric angle of 20 degrees compressing the distal D3 (arrow). Severely distended stomach (Long arrow)

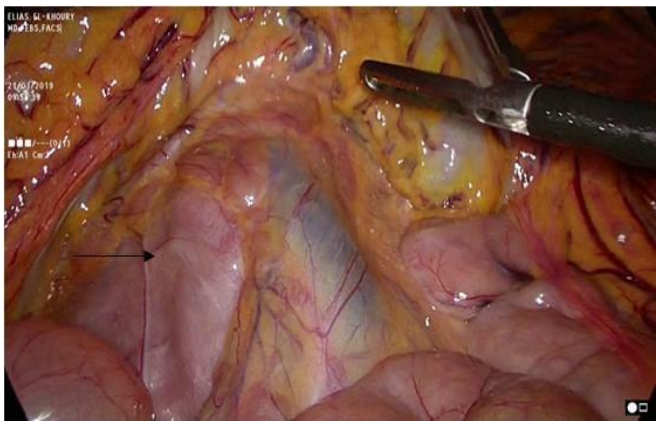

Figure 2: Third duodenum (Arrow) Retracted transverse colon with its mesentery (grasper)

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http://www.acmcasereport.com/

Citation: El-Khoury Elias, El-Darazi Elham and El-Attrache Najib. Superior Mesenteric Artery Syndrome Treated by Laparoscopic Duodenojejunostomy. Annals of Clinical and Medical Case Reports. 2020; 4(1): 1-4.

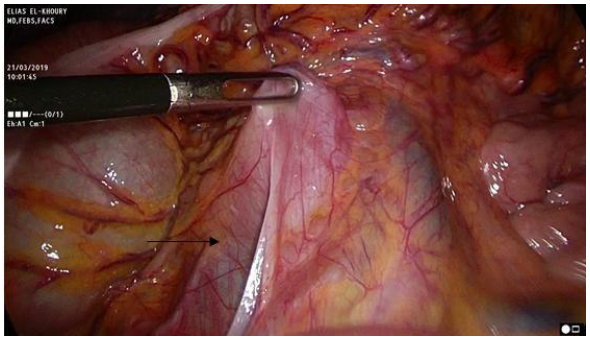

Figure 3: Retraction of D3 (by the grasper) with identification of its inferior limit (arrow)

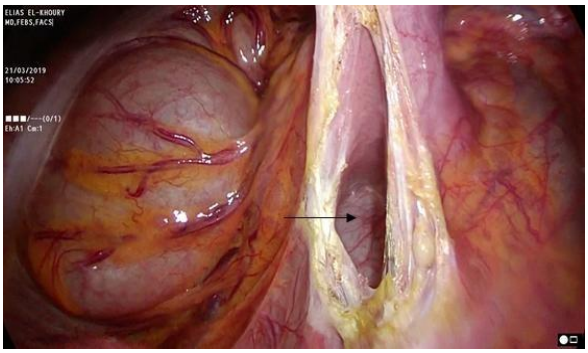

Figure 4: Incision of the peritoneal layer inferior to D3 and entering the retroperitoneum with identification of the IVC (arrow)

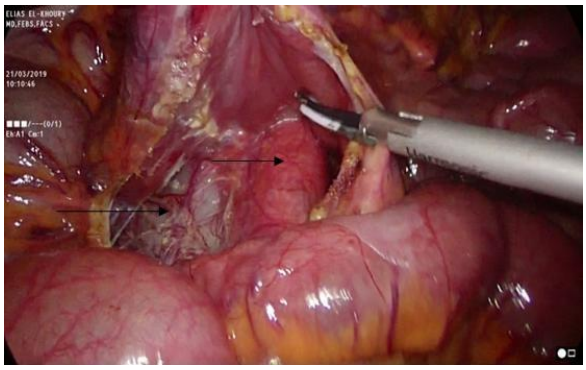

Figure 5: Posterior mobilisation of D3 from the IVC (longer arrow) and aorta (arrow)

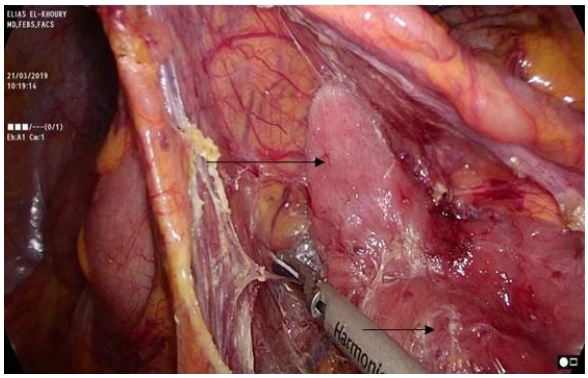

Figure 6: Medial mobilisation of D3 (arrow) and identification of D2(longer arrow)

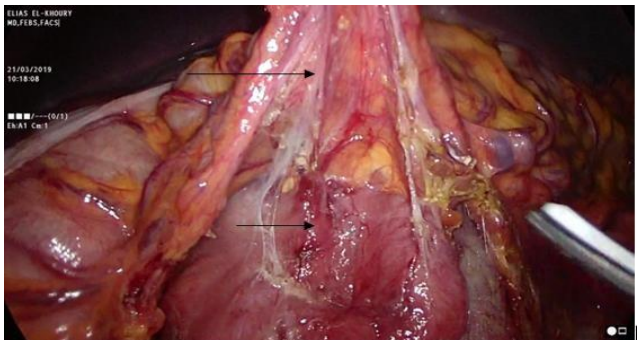

Figure 7: Upper part of D3 (arrow) dissected from the transverse mesocolon (longer arrow)

Figure 8: Mechanical duodenojejunal anastomosis

4. Discussion

SMA Sd was first reported by Von Rokitansky on an autopsy [1]. Wilkie further detailed its pathophysiology and diagnostic findings [2]. It is very rare with an incidence below 0.3%, [3, 4] affecting mainly young adults and more commonly female patients [5]. SMA Sd should be on the top of the differential diagnosis in severely underweight patients with signs and symptoms of intestinal obstruction. In normal individuals, the angle created by the SMA and the aorta is around 38 and 56 degrees while the normal distance is 10-20 mm [6, 7]. In SMA Sd the distal part of D3 becomes compressed between the SMA and the aorta when the aortomesenteric angle is less than 25% and the distance is shortened to < 8 mm [8-11]. This is due in the majority of cases to the loss of the mesenteric fat pad, [12] like in extreme weight loss, in some cases in bariatric surgery, cancer, burns, and anorexia nervosa [13]. In a minority of cases, SMA Sd is caused by anatomic variants like short ligament of Treitz, high insertion of duodenum at the ligament of Treitz, low origin of SMA, lumbar hyperlordosis, where the aortomesenteric angle is anatomically more acute or D3 is more cephalad than usual and thus compression is more likely [14]. SMA Sd can be a surgical

complication like in scoliosis surgery, [14, 15] ileoanal pouch surgery, [16] abdominal aortic aneurysm repair [15]. SMA Sd may rarely coexist with the Nutcracker syndrome when the left renal vein becomes compressed [17, 18]. CT scan is the standard diagnostic radiological tool as it allows the measurement of the aortomesenteric angle and distance. SMA Sd presents like any intestinal obstructive disease. Relief occurs when the patient goes from supine to prone position because gravity contributes to the duodenal compression. Initially, SMA Sd should be treated conservatively, and surgery is needed when medical treatment fails [19, 20]. The surgical options include duodenojejunostomy, gastrojejunostomy and duodenal derotation. Gastrojejunostomy does not relieve the proximal duodenal obstruction and patients can continue to have postoperative vomiting [21]. Duodenal derotation has the advantages that it does not require an anastomosis, however it has a high failure rate [9, 22, 23]. Laparoscopic duodenojejunostomy, first performed in 1998, [24] is considered to be the best surgical treatment for SMA Sd with the same outcome as open surgery but with less morbidity with 90% success rate [6, 17, 22, 25-28].

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