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Case Report

Laparoscopic repositioning of the third and fourth portions of the duodenum in Wilkie's syndrome: a case report

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ABSTRACT

Wilkie's syndrome, or superior mesenteric artery syndrome (SMAS), is a rare vascular compression disorder caused by reduction of the aortomesenteric angle and distance, leading to obstruction of the third portion of the duodenum. We report a 35-year-old female with an eight-year history of postprandial abdominal pain and nine months of vomiting associated with 18-kg weight loss. Magnetic resonance imaging demonstrated an aortomesenteric angle of 33° and distance of 10 mm, with morphologic compression of the third portion of the duodenum. Following failure of conservative management and a body mass index of 17 kg/m², laparoscopic repositioning of the third and fourth portions of the duodenum was performed. Approximately 5 cm of aortomesenteric decompression was achieved. The postoperative course was uneventful with discharge on postoperative day two. At one month, symptoms resolved with 4-kg weight gain. At five-year follow-up, the patient remains asymptomatic with stable normal body mass index (BMI). Minimally invasive anatomical decompression represents a durable and physiologic alternative to bypass procedures.

Keywords: Wilkie's syndrome, Superior mesenteric artery syndrome, Laparoscopic surgery, Duodenal repositioning, Aortomesenteric angle

INTRODUCTION

Wilkie's syndrome is an uncommon cause of proximal gastrointestinal obstruction resulting from compression of the third portion of the duodenum between the superior mesenteric artery and the abdominal aorta.[1]

Under physiological conditions, the aortomesenteric angle ranges between 25° and 60°, and the aortomesenteric distance between 10 and 28 mm. Depletion of retroperitoneal fat may critically narrow this interval and compromise duodenal transit.[2]

The clinical presentation is often nonspecific and includes postprandial pain, nausea, vomiting, and progressive weight loss, frequently leading to delayed diagnosis.[3]

CASE REPORT

A 35-year-old female presented with chronic postprandial abdominal pain for eight years and progressive vomiting over nine months with 18-kg weight loss. Magnetic resonance imaging (MRI) demonstrated a reduced aortomesenteric angle (33°) and distance (10 mm), with evident morphologic compression and proximal duodenal dilatation, confirming the diagnosis in the appropriate clinical context (Figure 1). Conservative management failed. With body mass index (BMI) 17 kg/m² and persistent debilitating symptoms, surgical intervention was indicated. Given the young age of the patient and absence of intrinsic duodenal pathology, anatomical decompression was preferred over duodenojejunostomy to preserve physiological gastrointestinal continuity and avoid enteric anastomosis.

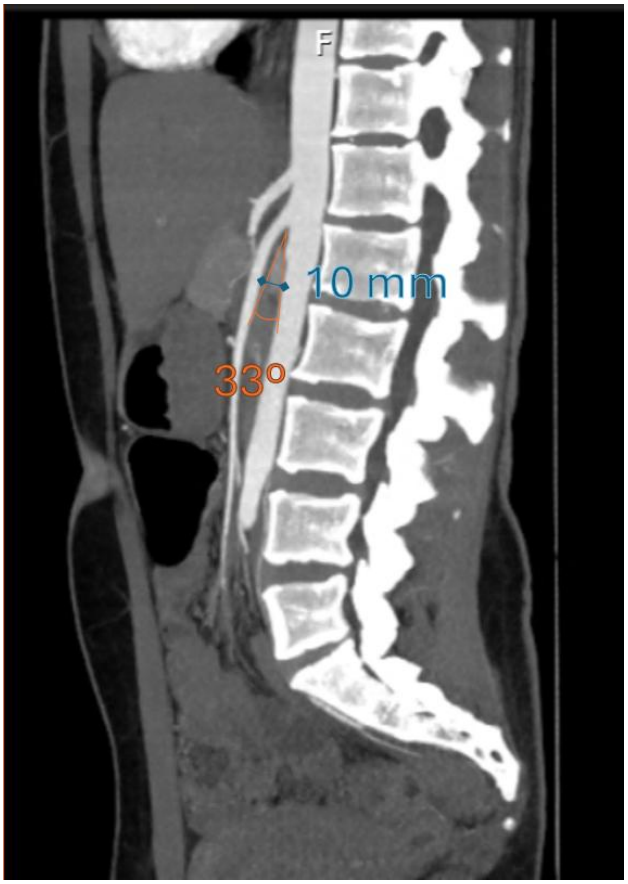

Figure 1: Sagittal MRI/angiographic reconstruction demonstrating reduced aortomesenteric angle (33°) and aortomesenteric distance (10 mm), consistent with compression of the third portion of the duodenum.

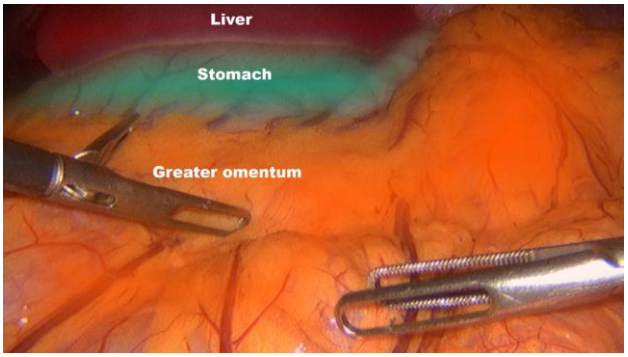

Figure 2: Initial laparoscopic view showing the liver superiorly, anterior stomach, and greater omentum before duodenal mobilization.

Laparoscopic repositioning of the third and fourth portions of the duodenum was undertaken. Complete mobilization of the duodenum was achieved through careful retroperitoneal dissection, ensuring tension-free repositioning. Approximately 5 cm of aortomesenteric decompression was obtained, consistent with operative recommendations. The right ovarian artery defined the inferior boundary of safe dissection. Intraoperative images were illustrated in Figures 2-10.

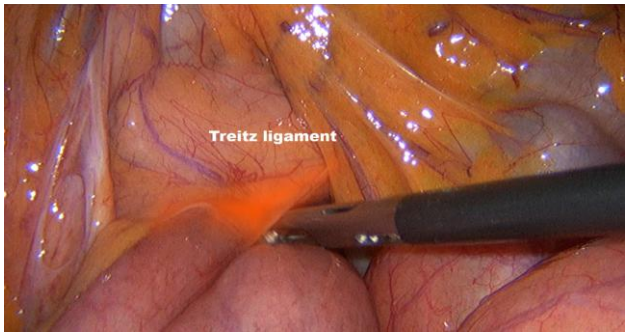

Figure 3: Identification of the ligament of Treitz at the duodenojejunal junction during mobilization of the fourth portion of the duodenum.

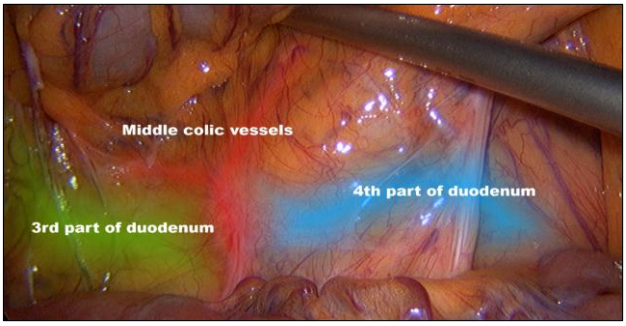

Figure 4: Exposure of the third and fourth portions of the duodenum in relation to the middle colic vessels during duodenal repositioning.

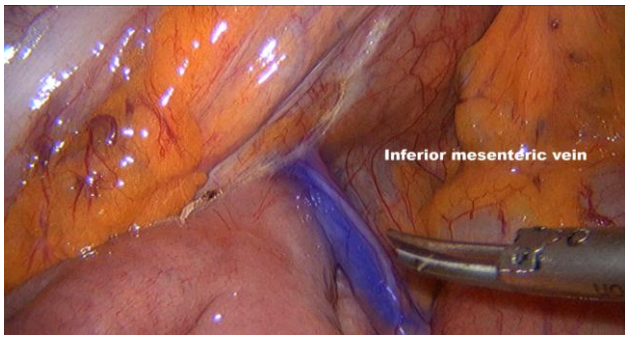

Figure 5: Identification of the inferior mesenteric vein during retroperitoneal dissection.

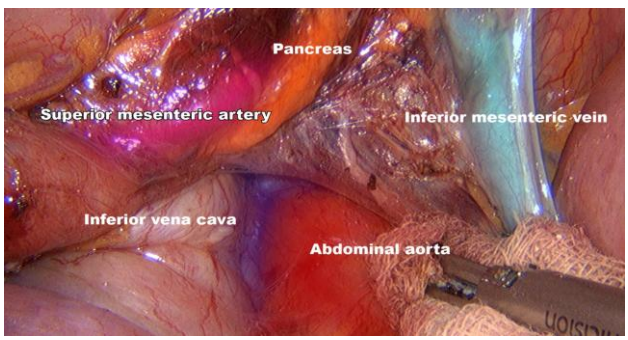

Figure 6: Exposure of the superior mesenteric artery arising anteriorly from the abdominal aorta, illustrating the aortomesenteric interval.

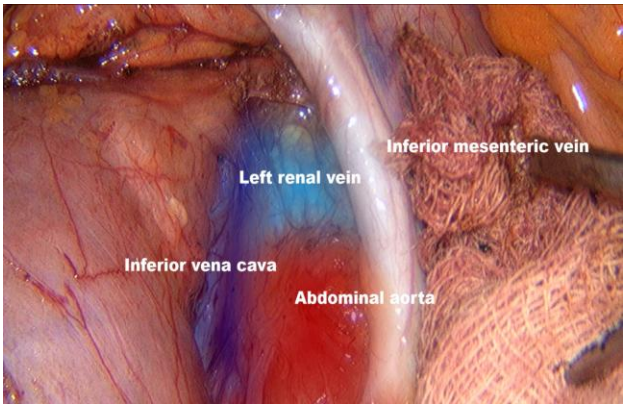

Figure 7: Identification of the left renal vein crossing anterior to the aorta within the retroperitoneal field.

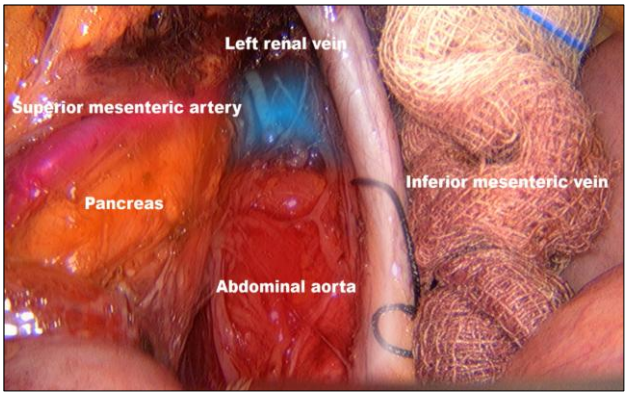

Figure 8: Intraoperative view demonstrating the aorta and inferior vena cava with adjacent vascular structures within the aortomesenteric region.

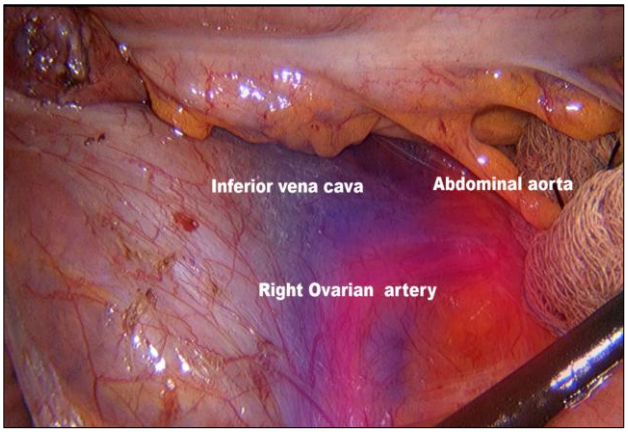

Figure 9: Visualization of the right ovarian artery, defining the inferior limit of the retroperitoneal dissection.

The patient was discharged on postoperative day two. At one month, she reported complete symptom resolution and 4-kg weight gain. At five-year follow-up, she remains asymptomatic with stable normal BMI.

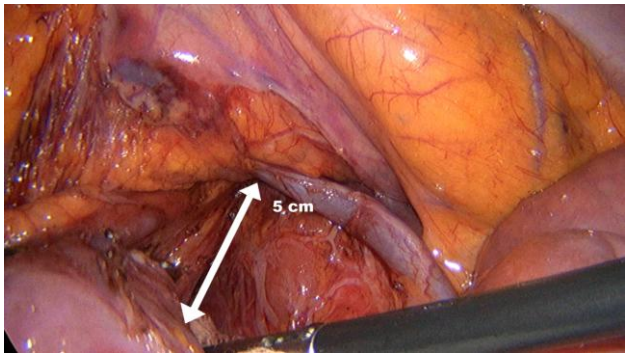

Figure 10: Demonstration of the achieved aortomesenteric dissection space (~5 cm), corresponding to the recommended length of release for adequate decompression.

DISCUSSION

Radiologic thresholds commonly describe symptomatic SMAS with an angle <22–25° and distance 2–8 mm; however, diagnosis should not rely solely on numeric cut-offs.[4] In the present case, the diagnosis was based on the combination of borderline angular reduction, clear morphologic compression, proximal duodenal dilatation, and long-standing compatible symptoms. Duodeno-jejunostomy remains the most frequently reported procedure with high success rates; however, it requires enteric anastomosis and carries inherent risks.[5] Anatomical decompression techniques preserve physiological continuity and avoid bypass-related morbidity.[6] Operative literature recommends achieving approximately 4–6 cm of aortomesenteric release; the 5 cm obtained in this case aligns with these technical standards.[7]

Reports describing follow-up beyond five years after minimally invasive duodenal repositioning remain scarce. The durable five-year symptom-free outcome observed in this patient supports the long-term efficacy of this physiologic approach in carefully selected cases.

CONCLUSION

Laparoscopic repositioning of the third and fourth portions of the duodenum represents a safe, physiologic, and durable surgical option for Wilkie's syndrome refractory to conservative management.

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Ethical approval: Not required

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