

**Volvulus of the Small Intestine in adults with intestinal malrotation: case report**

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**ABSTRACT**

**Introduction:** *The volvulus of the small intestine with intestinal malrotation is a rare disease when occurring in adults, though, a surgeon's ignorance of this diagnosis can result in potentially fatal extensive small intestinal necrosis.*

**Presentation of case:** *Here, we present the case of a 57years old woman admitted and operated for a volvulus of the small intestine with intestinal malrotation after radiographic and pre-operative confirmation, whom follow up was unmarked.*

**Discussion:** *The usual mechanism of obstruction in the volvulus of the small intestine with intestinal malrotation is adhesive compression of the duodenum and volvulus of the small intestine, this condition is the result of an arrest in the normal counterclockwise rotation of the cecum from the left lower quadrant to the right upper quadrant. Pre-operative diagnosis not always an easy task but the abdominal CT-scan is with a great help mainly by identifying the "WHIRL-WIND" sign.*

*The Ladd procedure, consisting of division of Ladd's bands, widening of the mesentery, and incidental appendectomy, is considered the worldwide standard up til now.*

**Conclusion:** *This condition is rare and can be diagnosed mainly by CT-scan, however, the surgical management worldwide standard is the Ladd's procedure which can be led by laparotomy or laparoscopy and results in great outcome.*

**Keywords:** Intestinal Malrotation, Volvulus, Ladd Procedure, Midgut Volvulus.

## INTRODUCTION

The incidence of the volvulus of the small intestine in adults with intestinal malrotation is 0.5—1 per 10,000 births [3], occurring during the first month of life in 80% of cases [4]. In older children, malrotation is diagnosed much less commonly and is complicated by total small intestinal volvulus in only a third of cases [5]. Hence, it is a rare condition observed among adult population. Most adult patients with intestinal malrotation are asymptomatic and are only discovered incidentally [6].

## AIM OF THE ARTICLE:

A surgeon's ignorance of this diagnosis can result in potentially fatal extensive small intestinal necrosis or result in short bowel syndrome.

The aim of this study is to describe our experience with a volvulus of the small intestine in adults with intestinal malrotation encountered while operating a bowel obstruction on a female adult patient and to present a review of the literature.

## PRESENTATION OF CASE

We present the case of a woman aged 57 years old, operated 20 years earlier for gallstones under coelioscopy, admitted in our structure for a high digestive occlusion evolving for 10 days.

The clinical examination finds a patient conscious, hemodynamic and respiratory stable, performance status at 2, presence of wrinkles of dehydration, pelvic touches without particularities.

An abdominal CT scan performed showing a duodenal volvulus (3rd duodenum) with displacement to the right of the upper mesenteric pedicle realizing the sign of the "WHIRL-WIND", associated

with a right colic interposition in the right sub diaphragmatic (Chilaiditi syndrome)



Figure 1: an abdominal CT scan slide showing a whirl-wind sign

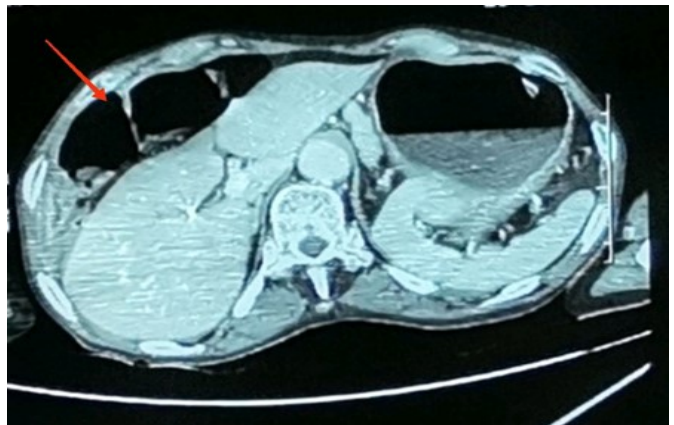


Figure 2: an abdominal CT scan slide showing the Chilaiditi syndrome



Figure 3: an abdominal CT scan slide showing the volvulus of the 3rd duodenum

The intervention was a cure of the total volvulus of the small bowel on incomplete common mesentery according to the procedure of Ladd, in which the exploration finds a volvulus of the small intestine on the right of the spine performing a turn of the spire in the clockwise, the small intestine was externalized and diverted (small viable intestine), the

coecum under hepatic, adjoined to the 2nd duodenum by the Ladd flange performing extrinsic compression on the 2nd duodenum, presence of the duodeno-jejunal junction on the right of the spine.

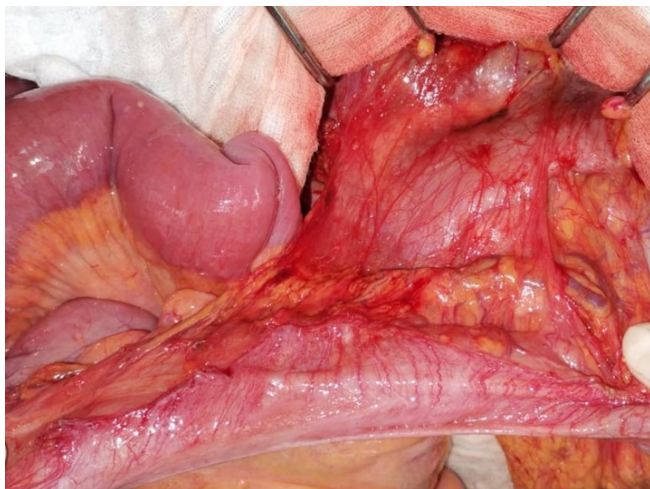


Figure 4: Per-operating image of a Ladd's flange



Figure 5: Per-operating image showing a short duodenum after liberating the Ladd's flange

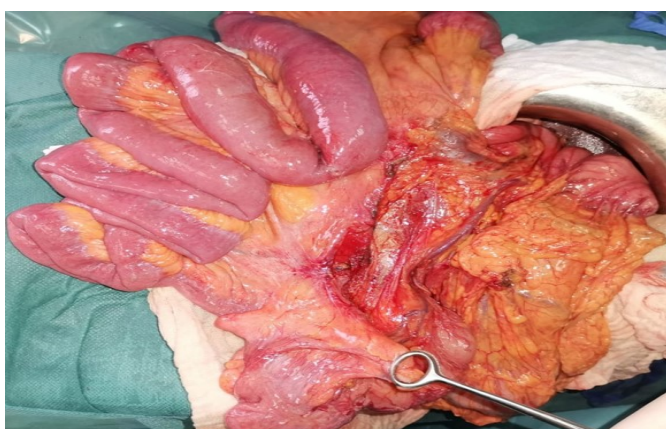


Figure 6: Per-operating image showing the duodeno-jejunal junction at the right of the upper mesenteric vessels after liberating the Ladd's flange

Post-operative follow-up was unremarked, patient declared discharged at 7 postoperative days.

## DISCUSSION:

In contrast to the newborn, the incidence of the **volvulus of the small intestine with intestinal malrotation** in adults is extremely low and is not accurately known. In the neonatal period, malrotation is frequently associated with other birth defects (gastroschisis, omphalocele or diaphragmatic hernia) in 46% to 70% of cases [7,8]. Malrotation is usually an isolated finding when diagnosed in adulthood [9].

The process of intestinal rotation in utero has been amply discussed in the literature [6,10,11,12,13]. Intestinal malrotation represents an arrest in the normal counterclockwise rotation of the cecum from the left lower quadrant to the right upper quadrant. In these cases, the cecum is often fixed in an abnormal position by dense adhesions that cross the duodenum (Ladd's bands). In addition, the colon and the small intestine have a common mesentery with a lack of fixation to the lateral and posterior regions of the abdominal cavity. The usual mechanism of obstruction is adhesive compression of the duodenum and volvulus of the small intestine.

As we present a 57 years old woman, the mean age of patients with small-bowel volvulus without malrotation in literature is reported to be in the fifth decade [14].

Preoperative diagnosis of volvulus of the small intestine is difficult. Physical examination and plain X-ray films are of limited diagnostic value, but abdominal CT plays a major role in the preoperative diagnosis of this condition. Several authors reported the usefulness of preoperative abdominal CT in



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the diagnosis of volvulus of the small intestine.

Tightly twisted mesentery around the point of torsion (WHIRL-WIND sign) was described as a typical sign of volvulus of the small intestine.[15,16]. The “whirl-wind” sign, corresponding to winding of the superior mesenteric vein (SMV) around the SMA.

Other signs of the volvulus of the small intestine in intestinal malrotation are duodenal obstruction, ischemia of the superior mesenteric vessels at their origin, and intestinal malrotation itself (ligament of Treitz to the right of the spine, lack of passage of the duodenum through the V formed by the aorta and SMA), and inversion of the superior mesenteric vessels at their origin (i.e. artery to the right of the vein), as well as signs of poor prognosis such as necrosis or pneumatosis of the bowel wall.

However, an erroneous initial diagnosis may lead to delay in correct management; this was the case in Kotobi's series where patients were given an initial diagnosis of “lymphoma”, “intussusception”, “paraduodenal hernia”, or “jejunal duplication”, before these diagnoses are corrected either preoperatively [18].

Proper management of patients with a strangulated obstruction depends on early and accurate diagnosis, and treatment must be timely to prevent gangrene. Surgical intervention must not be delayed. Proper preoperative management and early surgical treatment is essential for a better outcome. Detorsion should be selected when the intestine is viable. In the patients reported in the English-language literature, the outcome depended on the age of the patient and the duration of symptoms [17].

The mortality rate in India has been reported to be 26%, and it was increased in patients with intestinal necrosis [17].

With regard to management, most authors agree that the Ladd procedure remains the reference treatment both in children [5,8,19,20] and in adults [1,21]. However some authors report an incomplete Ladd procedure in adults [22], or a high rate of inappropriate surgical procedures [23,24].

The main reasons are the surgeon's lack of familiarity with this disease, with the Ladd procedure and the frequent presentation in an emergency context. Frasier, on the basis of 18 cases out of 22, emphasizes the usefulness of performing the Ladd procedure with the help of a pediatric surgeon [1]. In Kotobi's series [18], 6 procedures were performed with the help of a qualified pediatric surgeon. When the patient presents with chronic symptoms, the assistance of a pediatric surgeon is easy to arrange. In the emergency setting, this attitude is still possible and even desirable although more difficult to arrange, yet it was done twice in their series. Kotobi, therefore recommend the involvement of a pediatric surgeon whenever malrotation is suspected.

Laparoscopic reduction of the volvulus in the volvulus of the small intestine with intestinal malrotation is difficult if not impossible. Midline laparotomy remains the safest emergency approach. However, some have suggested that a laparoscopic approach may still be proposed for experienced surgeons with extensive knowledge of this disease [1]. In the treatment of uncomplicated malrotation, laparoscopy appears not only feasible [25] but also reliable, with all the benefits inherent in this technique [1]. A Ladd procedure performed laparo-

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scopically by SinglePort has even been reported [26].

### CONCLUSION:

The **volvulus of the small intestine with intestinal malrotation** is a very unusual finding in adult patients. The diagnosis can be made by CT scan, but it often comes to light only at the time of surgery, even though the patients have often had recurrent episodes of abdominal symptomatology that dated back to childhood. The Ladd procedure, consisting of division of Ladd's bands, widening of the mesentery, and incidental appendectomy, remains the standard surgical repair. Digestive surgeons who care for adults should be familiar with this procedure.

### PROVENANCE AND PEER REVIEW:

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### CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

### CONFLICTS INTERESTS

Authors have declared that no competing interests exist.

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