

## **Unusual Case: Abdominal Pain Syndrome Secondary to Congenital Defect of the Round Ligament of the Liver in an Adult Patient**

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### **Abstract**

**Introduction:** Falciform/ round liver's ligament defects are uncommon, have various clinical features that they can cause, and are generally diagnosed intraoperatively. Currently, abdominal tomography is performed routinely in the emergency room, it can help in the preoperative diagnosis and guide the therapeutic attitude to be performed, but currently, there are no characteristic tomographic data of this pathology. There are few published cases in the literature, and these were generally diagnosed at a late stage and were mostly among adults.

**Presentation of case:** We present a 45-year-old female patient who presented with acute abdominal pain to the emergency room. The patient had never undergone abdominal surgery.

**Discussion:** On diagnostic laparoscopy found the transverse colon and small intestine (duodenum) crossing a foramen in the liver's round/ falciform ligament. The obstruction was resolved by dividing part of the ligament without intestinal resection.

**Conclusion:** All structural entrapments caused by the falciform/ round liver's ligament are produced by an abnormal fixation process of the anterior peritoneum in its embryonic stage. The most common clinical presentation associated with these defects is intestinal obstruction. We propose the term "inclusion in the falciform/ round liver's ligament " as a concept to encompass these clinical presentations of pain, occlusion, or other digestive pathology, which are accompanied by an abnormal fixation of structures of the digestive system towards the falciform/ round liver's ligament. An accurate diagnosis is only possible under direct vision in surgery, where, in addition to being diagnostic, it is therapeutic.

**Keywords:** *Thickening and Shortening of the Round Ligament of the Liver; Falciform ligament; Falciform Window; Round Ligament of the Liver; Congenital*

### **Introduction**

The management of the acute abdomen is one of the pillars of general surgery. As technological advances appear, it is possible to plan procedures in greater detail and even offer minimally invasive management, as long as the pathology is diagnosed to be resolved.

However, there are no such frequent scenarios where it is impossible to understand abdominal pain's origin. Advanced imaging methods can be used and still not find a specific alteration, which could result in an inadequate interpretation, leading us to believe that everything is in the patient's mind.

The case of a woman with severe abdominal pain and marked sensitivity on physical examination is presented. The initial approach is not conclusive. However, due to the persistence of pain, diagnostic laparoscopy is indicated. An unusual anatomical situation can be visualized: the transverse colon and small intestine crossing the round ligament of the liver.

This entity is an infrequent presentation of internal hernia. It has a reported incidence of 0.2% [1]. More than a hernia, it is an anomaly in the formation of this structure (falciform/round ligament), leading to imprisoning developing structures. Depending on the structure, a varied clinical picture and a different age of presentation may occur.

The case is a lesson on the study of abdominal pain beyond the common causes. It provides us with an understanding of the importance of the anatomical situation of the round ligament of the liver.

### Case Report

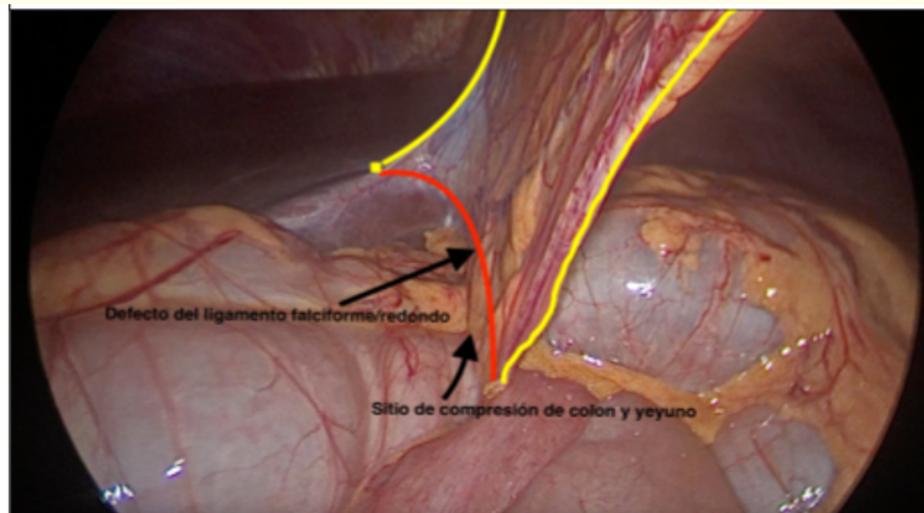
A 45-year-old female patient came to the emergency department with severe (10/10) oppressive abdominal pain in the mid-gastric region, which began 3 hours previously. She denied fever, nausea, vomiting, dysuria, extenuating, exacerbating. Background: acid peptic disease with sporadic symptomatic management with esomeprazole and dimethicone magaldrate, cesarean section in 2000 without complications. Physical examination: Tachycardia and hypertension during episodes of pain. Slim patient, good muscle mass, with allergic facies, neurologically intact. Head, neck, and thorax without alterations. Soft, depressible abdomen, scant distension, underactive peristalsis, pain on deep palpation in a colicky setting, with no evidence of peritoneal irritation. Limbs without alterations.

Upon her admission, laboratories were taken, which were reported within normal parameters. An ultrasound of the liver and bile duct was performed, where no alterations were found. Subsequently, an abdominal CT scan was performed (Image 1). An abnormal arrangement of jejunal loops was reported, with a position posterior to the stomach, and displacement of the descending colon towards the medial, without data of ischemia or perforation. It was concluded as a probable internal hernia.

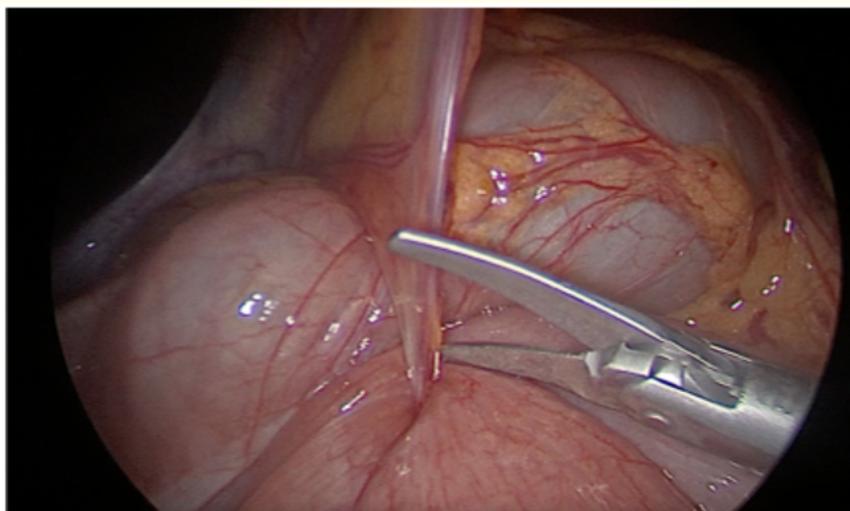


**Image 1:** Tomografía de abdomen (corte coronal) donde se observa sitio de estenosis del colon transeverso.

Surgical management by diagnostic laparoscopy was indicated. Ports were placed without incident; no free fluid or loop distention was observed. Transverse colon and small intestine (jejunum) were identified by crossing a hole at the junction of the falciform ligament and the round ligament of the liver (Image 2 and 3). The colon did not show perfusion alterations, and the jejunum showed a slight increase in vascularity. Neither structure was fixed to the ligament. A cold cut of the posterior border of the ligament was made, and both intestinal loops were released, which presented spontaneous peristalsis. A review of the rest of the cavity was carried out without finding other findings, and port closure was performed in the usual way.



**Image 2:** Tomografía de abdomen (corte coronal) donde se observa sitio de estenosis del colon transverso.



**Image 3:** Sitio de corte y liberación de asas.

The patient resumed orally at 24 hrs and was discharged at 48 hrs. In follow-up, she did not present abdominal pain again.

### Discussion

The clinical presentation of this case led us to rule out the common causes of acute abdomen in the first place. CT was not expected, and the absence of a surgical history ruled out the presence of an adhesion process. However, it was necessary to see it to understand it: the colon and jejunum indeed “imprisoned” through the round ligament of the liver. The initial concept that arises is that of a congenital bridle or band. However, this was not the case since rather than an added structure, what we observed was the round ligament with a congenital defect.

The search for information has also been a challenge since there is no standardized concept for this situation. In this case, we found a defect in the union of the falciform ligament with the round. The reviews generally address two types of situations: 1) Defect of formation of the falciform ligament (in these cases, they call it internal hernia due to the “falciform ligament window”), and 2) Defect in the formation of the round ligament (it does not have a specific name).

Martins, *et al.* (2008) report a defect in the round ligament that produces an entrapment, including the stomach, duodenum, or even colon [2]. In this publication, few antecedents are cited (9 references), which only mention in their titles the development of clinical pictures of intestinal obstruction that required surgical management and where anomalies associated with the round ligament were found [3-8]. They mention that this defect was described for the first time by Langenbeck in 1894, which in turn is a reference to the original article by De Yoe and Lanacona from 1951, describing pyloric stenosis secondary to the round ligament defect [9]. Stehr and Gingalewski (2006-2012) describe the formation of these defects, mention that the failure in the peritonization of the umbilical vein together with the development of this double sheet that is fixed anteriorly to the diaphragm, from the anterior wall to the level of the umbilicus and to the liver down to its underside, it allows the resulting ligament to form a space where the free structures of the abdomen can be trapped [10].

The TAC is the ideal cabinet study. Yamaoka, K., *et al.* Review the importance of studying four fine structures of the anterior wall: the round ligament of the liver, the median umbilical ligament, and the medial umbilical ligaments. In these structures, important congenital abnormalities can be seen, including the congenital or non-congenital defect of a falciform ligament herniation [1]. Stehr mentions that in a CT scan where the intestine is observed above the liver and centered on the falciform ligament, this defect should be suspected. [10].

Reports agree that surgical release (either with a complete or partial ligament division) resolves the clinical picture and leaves no other sequelae [2-10].

The case presented shows a clinical picture of vague abdominal pain, for which common causes of acute abdominal pain were ruled out. The CT scan concludes with the diagnosis of internal hernia, with an “abnormal arrangement of the jejunal loops, which are located posterior to the stomach with a displacement of the descending colon medially.” Given the persistence of symptoms and CT findings, it was decided to perform diagnostic laparoscopy.

Thanks to this case, it can be understood that the abnormal peritonization process can allow defects with variants throughout their anterior fixation, and therefore the clinical pictures also vary.

### Conclusion

Currently, there is no consensus in the literature since some speak of a defect in the falciform ligament and others in the round ligament. Still, these observations must conclude that all structural entrapments are produced by an abnormal fixation process of the peritoneum. Anterior in its embryonic stage. The most common clinical picture associated with these defects is obstruction, although the case presented here was acute abdomen.

The term “inclusion in the round/sickle ligament” is proposed as a concept to encompass these clinical pictures of pain, occlusion, or other digestive pathology, which are accompanied by an abnormal fixation of structures of the digestive tract towards the round and/or sickle ligament.

CT can describe abnormal fixation of these structures. However, an accurate diagnosis is only possible under direct vision in surgery (open or laparoscopic) where the release and resolution of abnormal fixation are achieved.

### Conflict of Interest

There is no conflict of interest in the preparation of the submitted work.

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