

Isolated Inflammatory Necrosis of the Falciform Ligament: A Case Report with Review of Literature

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Abstract

Inflammatory necrosis of the falciform ligament is an extremely rare cause of acute right upper quadrant pain. Due to overlapping symptoms with pathologies affecting the gall bladder and liver, this poses a diagnostic challenge with limited existing literature. Here, we report a case of a 62-year-old female patient presenting in the accident and emergency department with right upper quadrant pain. The patient underwent ultrasonography and revealed thickened and echogenic falciform ligament. Further, a computed tomography revealed swollen falciform ligament with associated fat stranding. The patient was kept under conservative management and improved over 2 weeks.

Keywords: Falciform ligament, ligamentum teres, round ligament

INTRODUCTION

The falciform ligament is a peritoneal fold extending from the anterior abdominal wall to the umbilical fissure of the liver. The free edge of the ligament is known as the ligamentum teres or the round ligament. Embryologically, the falciform ligament is derived from the ventral mesentery, while the ligamentum teres represent the obliterated umbilical vein. Normally, these structures are not visualized prominently on ultrasound. The inflammation and necrosis of the falciform ligament can be isolated or coupled with other pathologies like pancreatitis. Etiologically, it can be either due to infective, ischemic, or idiopathic causes. This case report tends to explore the pathophysiology of this entity and review existing literature.

CASE REPORT

A 62-year-old female patient presented to the emergency department with acute right upper quadrant abdominal pain which was radiating to the back and all over the abdomen, mild fever, and vomiting episodes that were small in amount and nonbilious in nature. The pain was persistent and required analgesics round the clock. He was a known case of type 2 diabetes mellitus which was controlled under oral hypoglycemic agents. Clinical suspicion of either gall

bladder or pancreatic pathology was kept and an ultrasound was requested.

Initial ultrasound examination shows bulky and echogenic falciform ligament [Figure 1] with the absent flow on color Doppler study. Internal hypoechoic areas were seen. The rest of the examination was unremarkable. There were no signs suggestive of acute cholecystitis or pancreatitis. Serum amylase and lipase levels were assessed and were within the normal limit (serum amylase – 41 U/L, normal range - 0–67 U/L, S. lipase – 32 U/L, and normal range - 28–100 U/L). The total leukocyte count was 20,000/mm³.

Further, contrast-enhanced computed tomography was done and revealed bulky falciform ligament with extensive fat stranding and heterogeneous enhancement on postcontrast images [Figure 2]. The fat stranding was also seen within the omentum and mesentery. There was no evidence of recanalization of the umbilical vein. The main portal vein and left branch showed normal contrast enhancement.

The patient was managed conservatively under antibiotic cover with pain management with significant improvement

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in 2 weeks. A repeat ultrasound showed significantly reduced echogenicity around the falciform ligament [Figure 3].

DISCUSSION

The falciform ligament along with the round ligament is an important peritoneal landmark. Apart from embryological significance, its affection in various pathologies can be attributed to its vascular supply. Arterial supply is derived from the branches of the right hepatic artery and superficial inferior epigastric artery while the venous drainage is through paraumbilical veins mainly draining into the anterior abdominal

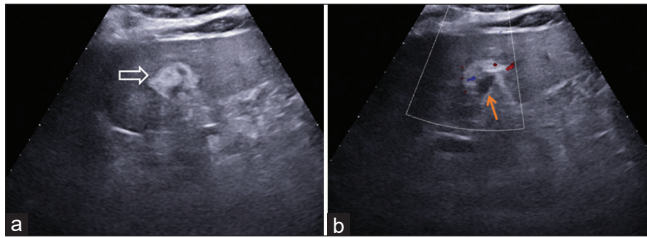


Figure 1: Transverse ultrasound images show thickened and echogenic falciform ligament (open white arrow in a). Doppler study shows an absence of flow within it (orange arrow in b)

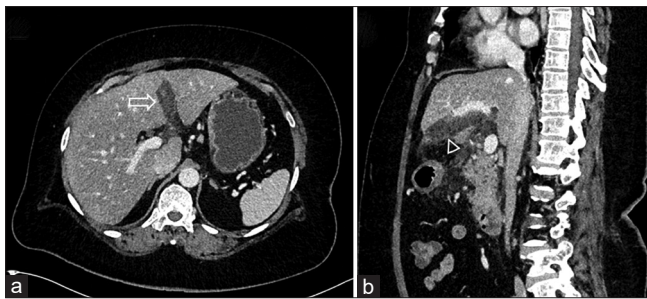


Figure 2: Contrast-enhanced axial (a) and sagittal (b) CT images show bulky and hypodense falciform ligament with associated fat stranding (open white arrow in a and open arrowhead in b). The left portal vein is normally opacified. CT: Computed tomography

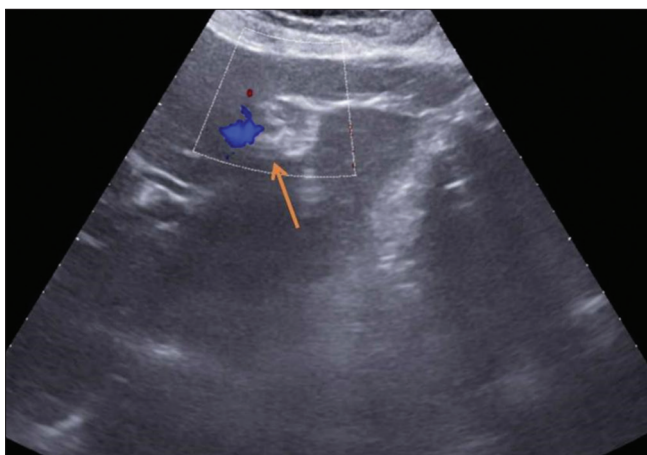


Figure 3: Transverse ultrasound image on follow-up after 2 weeks shows reduced echogenicity of the falciform ligament (orange arrow) with no flow on Doppler study

wall and epigastric veins.^[1] Lymphatics drain through the lesser omentum and retroperitoneum.^[2] These connections explain its involvement in inflammation of surrounding structures such as the pancreas, gall bladder, and liver as well as distant emboli arising from the retroperitoneum or anterior abdominal wall.

A review of literature through PubMed (National Library of Medicine, National Institutes of Health) with keywords “falciform ligament inflammation,” “falciform ligament necrosis” and “round ligament necrosis” revealed important epidemiological factors of this pathology. There is an equal predominance in males and females, especially the ones occurring in solitary to co-existing pathologies.

The most commonly reported co-existing pathologies were acute cholecystitis with or without cholelithiasis, followed by acute pancreatitis,^[3,4] and intra-abdominal abscess.^[5] Few cases associated with preexisting cysts,^[6] tumors,^[7] and internal hernia^[8,9] are also reported. Preexisting comorbidities include diabetes mellitus as in our case, hypertension, or any condition predisposing to recanalization of umbilical vein like portal hypertension.

Isolated inflammation of these ligaments is also reported. Bhatt *et al.*^[6] reported a case of spontaneous necrosis and inflammation of falciform and the round ligament in a 53-year-old male diagnosed intraoperatively and retrospective review of CT. Furthermore, a literature review by the authors revealed 43 cases of falciform ligament inflammation, however, most of them were either associated with inflammation of adjacent organs or diagnosed intraoperatively.

Hence, it is important to know the normal as well as pathological imaging appearances of the falciform ligament on both ultrasound and cross-sectional imaging. A normal falciform ligament on ultrasound appears as an echogenic structure of variable thickness owing to a variable amount of fat present along the free edge of the ligament. In cases of preexisting conditions such as portal hypertension, the recanalized umbilical vein may be seen along the ligament. In event of inflammation or necrosis of the ligament, there is increased echogenicity with internal hypoechoic areas denoting fat necrosis.^[10,11] Associated lesions such as lipomas,^[12] abscesses,^[13] or cysts may also be identified on sonography. Assessment with Doppler study is important to assess for a recanalized umbilical vein. Furthermore, an assessment of portal veins and right hepatic artery branches is necessary to look for an extension of thrombosis into these vessels. At times, probe tenderness may be elicited in the epigastric area. It is also important to assess for co-existing pathologies, for example, cholecystitis and acute pancreatitis. On CT, there is a significant thickening of the falciform ligament with fat stranding. On postcontrast images, there is variable enhancement. An attempt should be made to look for the recanalized umbilical vein as well as portal veins and hepatic arteries.

Diagnosis is often delayed due to a lack of awareness of this entity and limited literature, leading to complications

and subsequent operative management in most cases. Recently, the term intraabdominal focal fat infarction was coined to include self-limiting pathologies involving focal fatty inflammation and necrosis. These include the epiploic appendages, greater omentum, and rarely perigastric ligaments.^[14] These entities are great mimickers of acute abdomen and often remain underdiagnosed. Diagnosed timely with the exclusion of other associated pathologies, spontaneous clinical evolution is seen to reduce the need for unnecessary surgical intervention.^[14]

CONCLUSION

This case report highlights the importance of recognizing falciform ligament inflammation as a rare but possible cause of acute right upper quadrant pain for both physicians and radiologists. Preoperative imaging of the ligaments and assessment for associated co-existing pathologies for timely management was the key point and is important to prevent complications. A further important point is a nonoperative management in this case with a favorable outcome, again emphasizing timely diagnosis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent form. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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