

Torsion of the Falciform Ligament Diagnosed by Imaging Tests – Case Report of an Unusual Disease

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Abstract: The falciform ligament is a peritoneal double layer that anatomically divides the right and left hepatic lobes. Abnormality of the falciform ligament is rare – less than 20 cases of torsion of the falciform ligament have been reported to date in adults. The pathophysiology of these entities is similar to intra-abdominal focal fat infarction. The clinical of the patient with torsion of the falciform ligament is abdominal pain of sudden onset and focal location. Laboratory tests can lead to diagnostic confusion with cholecystitis. Ultrasonography is usually the initial evaluation test, but the gold standard diagnosis is computed tomography. We report the case of a 30-year-old female patient reporting sudden abdominal pain that radiates to the dorsal region associated with nausea and vomiting diagnosed with torsion of the falciform ligament with ultrasonography and confirmed with computed tomography. She was treated conservatively without the need for surgical treatment, being discharged after one week hospitalization.

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Introduction

The falciform ligament is a peritoneal double layer that anatomically divides the right and left hepatic lobes (Uyttenhove et al., 2013; Indiran et al., 2018). Structurally, it extends from the upper border of the liver to the lower border of the diaphragm surrounded by a considerable amount of extraperitoneal fat (O'Connor et al., 2022).

Abnormality of the falciform ligament is rare. Less than 20 cases of torsion of the falciform ligament have been reported to date in adults (Indiran et al., 2018). Other recognized abnormalities of the falciform ligament include:

- Ligament cysts
- Tumours
- Abnormal vascularity due to portal hypertension
- Iatrogenic internal hernia through the ligament
- Gangrene related to necrotizing pancreatitis along with twisting of a fatty appendage.

Herein, we report the case of a 30-year-old female patient reporting sudden abdominal pain that radiates to the dorsal region associated with nausea and vomiting.

Case report

A 30-year-old female with pain that radiates to the back with vomiting for one day. She denies fever and reports an episode of diarrhea. She reports having had a cesarean section three months ago and is breastfeeding. On physical examination, she has a distended, flaccid, and painful abdomen on palpation in the upper hemiabdomen, with negative Giordano, Murphy, and sudden decompression tests. She denies other illnesses and the use of medications.

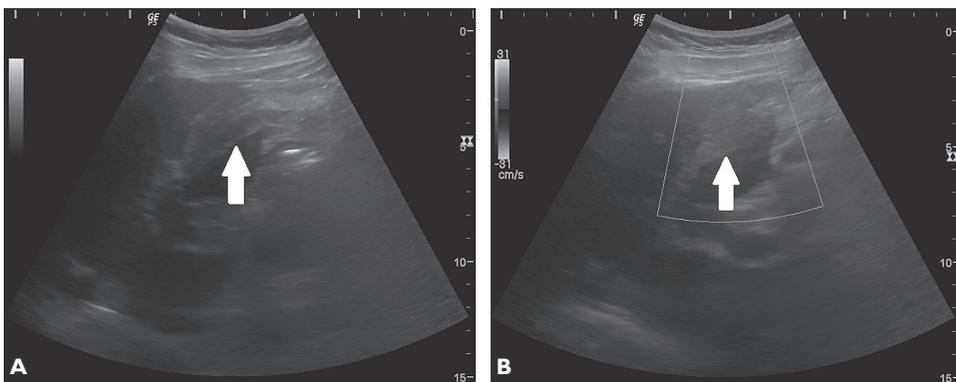


Figure 1 – Ultrasonography demonstrated a heterogeneous image, predominantly echogenic, elongated in A, without vascularization on the Doppler study between hepatic segments IV and II/III in B, compatible with torsion of the falciform ligament (white arrow).

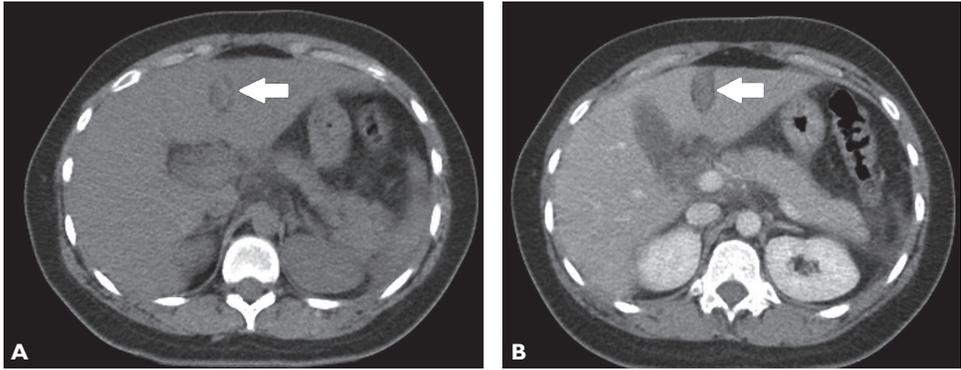


Figure 2 – Axial section of computed tomography scan without contrast in A and with contrast in the portal phase in B shows border sign and fatty mass along the falciform ligament, without contrast enhancement, compatible with torsion of the falciform ligament (white arrow).

The hemogram demonstrates leukocytosis ($29,930/\text{mm}^3$) with a shift to the left (myelocytes $299/\text{mm}^3$ and metamyelocytes $599/\text{mm}^3$). An increase in CRP (C-reactive protein) (62.08 mg/l) is also observed. Abdominal radiography is normal. Ultrasonography demonstrates a heterogeneous image, predominantly echogenic, elongated, and without vascularization in the Doppler study between hepatic segments IV and II/III, which may correspond to torsion of the falciform ligament (Figure 1). Computed tomography followed, which confirmed the ultrasound finding (Figure 2).

The patient was treated with dipyron (1 gram every 6 hours) and ondansetron (8 mg every 12 hours) during a one-week hospitalization, without the need for surgical treatment, being discharged without symptoms and medication at home.

Discussion

The pathophysiology of these entities is similar to intra-abdominal focal fat infarction, and it can occur in several anatomical regions such as the greater omentum, epiploic appendix, and fatty appendix of the falciform ligament (O'Connor et al., 2022). The clinical of the patient with torsion of the falciform ligament is abdominal pain of sudden onset and focal location. Laboratory tests can lead to diagnostic confusion with cholecystitis. Differential diagnoses consist of ligament cysts, tumours, hernias, and acute necrohemorrhagic pancreatitis (O'Connor et al., 2022).

Therefore, due to their epigastric location and similar pain associated with non-specific laboratory tests, they can be mistakenly confused with other gastroduodenal pathologies, cholecystitis, and acute pancreatitis (Uyttenhove et al., 2013; Indiran et al., 2018; Horak et al., 2019; O'Connor et al., 2022). Thus, a thorough investigation through exams, especially imaging tests as ultrasound and computed tomography, is necessary for early and accurate diagnosis (Uyttenhove et al., 2013).

Ultrasonography, which is usually the initial evaluation test due to its low cost, demonstrates a hyperechoic, oval, non-compressible image, surrounded by a peripheral hypoechoic halo, located in the region of greatest pain intensity. This finding makes the diagnosis suspect but does not differentiate the different etiologies, usually requiring a more detailed imaging exam (Maccallum et al., 2015; Bangeas et al., 2020; O'Connor et al., 2022).

The gold standard diagnosis is performed by computed tomography as in the case described. Computed tomography demonstrates the border sign with inflammatory tissue around the falciform planes and an image of a fatty appearance along the falciform ligament, without contrast enhancement, consistent with torsion of the falciform ligament (Maccallum et al., 2015; Bangeas et al., 2020; O'Connor et al., 2022).

It is necessary to integrate the anomalies of the falciform ligament, from the subtle characteristics that can be clinically expressed, to the performance of imaging tests – ultrasound and/or computed tomography. The faster the diagnosis is made, the more feasible it is to treat the patient conservatively with analgesics and rest, as in the case described. However, there is the possibility of laparotomy or exploratory laparoscopy in more severe cases of pain that is refractory to conservative treatment or whose pain returns intensely after a few hours of improvement (Maccallum et al., 2015; Horak et al., 2019; Bangeas et al., 2020).

Conclusion

Torsion of the falciform ligament is a diagnosis that, although rare, should be listed among the differential diagnoses of abdominal pain. Its diagnosis is treacherous since its symptoms and changes in laboratory tests are similar to those of cholecystitis and pancreatitis, which are diseases with a much higher incidence. Thus, imaging tests are essential in analysing their differential diagnoses and the torsion of the falciform ligament itself.

References

- Bangeas, P., Bitzika, S., Loufopoulos, P., Drevelegkas, K., Papadopoulos, V. N. (2020) Infarcted ligamentum teres hepatis lipoma mimicking acute abdomen in a female patient: A case report and mini-review of the literature. *J. Surg. Case Rep.* **2020(10)**, rjaa391.
- Horak, R. D., Mega, J. D., Tanton, P. J., Criman, E. T., Tabak, B. D., Rooks, V. J. (2019) Fatty-falciform ligament appendage torsion (F-FLAT): Diagnosis and management in a pediatric patient. *Radiol. Case Rep.* **15(3)**, 181–185.
- Indiran, V., Dixit, R., Maduraimuthu, P. (2018) Unusual cause of epigastric pain: Intra-abdominal focal fat infarction involving appendage of falciform ligament – Case report and review of literature. *GE Port. J. Gastroenterol.* **25(4)**, 179–183.
- Maccallum, C., Eaton, S., Chubb, D., Franzi, S. (2015) Torsion of fatty appendage of falciform ligament: Acute abdomen in a child. *Case Rep. Radiol.* **2015**, 293491.
- O'Connor, A., Sabri, S., Solkar, M., Ramzan, A., Solkar, M. (2022) Falciform ligament torsion as a rare aetiology of the acute abdomen. *J. Surg. Case Rep.* **2022(1)**, rjab150.
- Uyttenhove, F., Leroy, C., Nzamushu Lapan Mabila, J. R., Ernst, O. (2013) Torsion of a fatty fringe of the falciform ligament, a rare cause of right hypochondrial pain. *Diagn. Interv. Imaging* **94(6)**, 637–639.