Contents lists available at ScienceDirect



International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr



Case report Laparoscopic surgery of epidermoid cyst of the falciform ligament: A case report

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ARTICLEINFO	A B S T R A C T
<i>Keywords:</i> Epidermoid cyst of the falciform ligament Laparoscopic pericistectomy Case report	Introduction and importance: The falciform ligament is a peritoneal fold that extends from the anterior abdominal wall to the liver, which divides the liver into two lobes. Cysts of the falciform ligament are rare and without an apparent cause. The range of the symptoms can vary from abdominal pain to asymptomatic patients. Cysts are treated surgically, and resection is used to make a definitive diagnosis. <i>Case presentation:</i> A 36-year-old female patient was treated at an outpatient facility for epigastric pain that lasted for three months. Abdominal MRI and MSCT were performed to verify a cyst formation in the left liver area of about 12 cm in size. Laparoscopic resection of the cist was performed under general endotracheal anaesthesia. <i>Clinical discussion:</i> Falciform ligament tumours can be malignant or benign. Treatment of the cyst includes complete excision and pathohistological diagnosis to rule out malignancy. In most cases reported thus far, excision has been done after laparotomy. In our case, the operation was performed in a less invasive way, laparoscopically. <i>Conclusion:</i> Laparoscopy can serve as a diagnostic and therapeutic method for cysts of the falciform ligament, both smaller and more significant that infiltrate the surrounding structures

1. Introduction

The falciform ligament is a peritoneal fold that extends from the anterior abdominal wall to the liver, which divides into two lobes, right and left. A *teres hepatis* ligament can be found on the lower edge. It is a remnant formed by obliteration of the umbilical vein. Physiological variants of the ligament are rare and not clinically significant. Instead, they are most often an incidental finding during abdominal surgery [1].

Various pathological conditions such as necrosis, abscesses, tumours, and cysts are associated with the falciform ligament. Cysts of the falciform ligament are rare, and without an apparent cause. Only a few cases have been described in the recent literature and the exact incidence is not known. Symptoms range can vary from abdominal pain to asymptomatic patients. Cysts are treated surgically, and resection is used to make a definitive diagnosis, resulting in healing [2].

In this paper, we will present a patient with a large cyst of the falciform ligament infiltrating the diaphragm and pericard. A laparoscopic procedure was performed. This work was written in accordance with the SCARE criteria [3].

2. Case report

A 36-year-old female patient, a child care worker, was treated at an outpatient facility for epigastric pain that lasted for three months. Until now, she has not been seriously ill and has not had surgery or hepatobiliary disorders. Till this diagnoses, she has few abdominal ultrasound (last two years ago), which did not found any pathology. She is not taking any therapy, and there is no allergy in the anamnesis. She is a smoker and does not consume alcohol.

Abdominal MRI and MSCT were performed to verify a cyst formation in the left liver area of about 12 cm in size. The formation is free of calcifications in the wall, without hypervascularization, and corresponds to "simplex cysts" radiological characteristics (Fig. 1).

The serological test for echinococcus was negative, and alphafetoprotein, CEA, and Ca 19-9 were within the reference range. The patient was presented to the multidisciplinary team for diseases of the hepatobiliary system. Primary surgical treatment was decided according to the above.

Laparoscopic surgery was performed under general endotracheal anaesthesia with prior administration of thromboprophylaxis, 5000 IU

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https://doi.org/10.1016/j.ijscr.2021.106014

Received 13 April 2021; Received in revised form 19 April 2021; Accepted 21 May 2021 Available online 27 May 2021

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Fig. 1. Falciforme ligament cyst shown by MR imaging.

low-molecular-weight heparin. The patient was in a supine position. A Veress needle was inserted through the supraumbilical incision, and a pneumoperitoneum was achieved. Under laparoscopic control, two more 5 mm wide trocars were placed in the left and right lumbar regions. A large cyst in the falciform ligament area that infiltrates the diaphragm is presented (Fig. 2).

Tumour was mobilized, and resection of about two cm² of the diaphragm and the underlying pericardium was performed with a bipolar sealing device (Fig. 3). The pericardium was reconstructed with individual polifilament, slow resorbable sutures. We use this suture because we have good experience with his compliance during tying knots.

We removed preparation through an extended supraumbilical incision because we already have a 13 mm supraumbilical incision and the drain was placed under the diaphragm (Fig. 5) The operation went without any intraoperative complication, and it finished after 90 min, without conversion to open surgery.

The operation was performed by a hepatobiliary surgeon with many



Fig. 2. Intraoperative image showing epidermoid cyst in the area of the falciform ligament.



Fig. 3. Intraoperative image after cyst removal.

years of experience in laparoscopic abdominal surgery.

A round formation measuring $12\times12\times9$ cm in size with a smooth outer surface was pathophysiologically described. It was white on the cross-section margins, while the majority in the middle was a thick, brownish material.

Histologically, the wall is constructed of connective and adipose tissue, permeated with chronic inflammatory infiltrate. The inner surface is lined with multilayered squamous epithelium without atypia. The finding corresponds to an epidermoid cyst (Figs. 4 and 6).

The operation went smoothly, and the postoperative recovery was without complications. The patient was in good general condition, without experiencing any pain, and was discharged from the hospital on the fifth postoperative day to receive home treatment. The control ten months after the operation showed that the patient is without any clinical symptoms and any MSCT signs of relapse.



Fig. 4. Image of the surgical specimen showing epidermoid cyst with part of the diaphragm.



Fig. 5. Postoperative presentation of the wound and the abdominal drain.



Fig. 6. Patohistological finding of the cyst.

3. Discussion

Falciform ligament tumours can be malignant or benign. Various cases such as leiomyosarcoma, malignant fibrous histiocytomas, lipomas, cysts, and other formations have been reported in the literature [2,4,5,6]. Except for those that occur in the falciform ligament itself, tumours may extend to the falciform ligament from the area of the transverse fissure of the liver (lat. *Porta hepatis*) [7]. It may also be the site of tumour transplants from other areas [8].

Ligament cysts are rare and cause a wide range of symptoms ranging from pain and discomfort in the upper abdomen, dyspeptic symptoms to completely asymptomatic patients in whom they are found as an incidental finding during abdominal surgery [9]. Some imaging methods such as MRI, MSCT, including abdominal ultrasound, are used to diagnose. Since malignancy cannot be ruled out in this way, a complete resection of the cyst is required [10]. We divide cysts of the falciform ligament into primary, i.e. congenital, which can occur, for example, due to incomplete obliteration of the umbilical vein, and secondary, which occurs as a result of infections, trauma, or some other causes [10]. Complications include cyst rupture, bleeding, torsion, intestinal obstruction, and various other conditions [11].

Treatment of the cyst includes complete excision and pathohistological diagnosis to rule out malignancy. In most cases reported, excision has been done after laparotomy, while in only two cases has it been done laparoscopically [2,10,12,13]. In our case, it was a large, 12×12 cm cyst, which infiltrated the diaphragm. Laparoscopically, complete excision of the cyst was performed with resection of a part of the diaphragm and the underlying pericardium. In this less invasive way compared to laparotomy, we can excise smaller cysts and those that are limited to the falciform ligament and large ones that, like the one in our case, infiltrate the diaphragm and underlying pericardium.

4. Conclusion

Although rare, the falciform ligament's cysts must be taken as a differential diagnosis in abdominal masses and pain in the upper abdomen. Laparoscopy can serve as a diagnostic and therapeutic method for cysts of the falciform ligament, both smaller and more significant, that infiltrate the surrounding structures.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Sources of funding

None.

Ethical approval

No approval is required for this case report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Research registration

Not applicable.

Guarantor

Mislav Rakić, MD Ante Šabić, MD

CRediT authorship contribution statement

Mislav Rakić – Surgeon performing the operation, writing of original manuscript

Ante Šabić – Writining of original manuscript, data collection Matej Andabak – Data collection, revision of the manuscript Antonija Đuzel – Revision of the manuscript Amela Begović - revision of the manuscript Marijan Kolovrat - revision and final revision of the manuscript

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijscr.2021.106014.

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