

Serial Ultrasound and Computed Tomography Findings of Torsion of Lipomatous Appendage of the Falciform Ligament in a Child Treated by Conservative Management

보존적 치료를 시행한 소아 겸상 인대 지방 부속물 염전에서의 추적 초음파 및 CT 소견

Jeong Gu Nam, MD, Seong Hoon Choi, MD, Byeong Seong Kang, MD, Jae Yeong Kim, MD, Woon Jung Kwon, MD

Department of Radiology, Ulsan University Hospital, University of Ulsan College of Medicine, Ulsan, Korea

Torsion of the lipomatous appendage of the falciform ligament is extremely rare, and most patients have previously been treated surgically. We reported a case of torsion of the lipomatous appendage of the falciform ligament in a child, diagnosed by ultrasound (US) and computed tomography (CT) and treated conservatively. Real-time US and CT can aid an accurate diagnosis, and follow-up US can aid in making appropriate decisions for conservative treatment.

Index terms

Abdomen
Falciform Ligament
Torsion
Ultrasound
Computed Tomography

Received June 15, 2014

Accepted February 23, 2015

Corresponding author: Seong Hoon Choi, MD
Department of Radiology, Ulsan University Hospital,
University of Ulsan College of Medicine,
877 Bangeojinsunhwando-ro, Dong-gu, Ulsan 682-714,
Korea.
Tel. 82-52-250-7250 Fax. 82-52-252-5160
E-mail: drcsh@naver.com

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Pathologies of the falciform ligament have rarely been reported (1-3), and torsion of the lipomatous appendage of the falciform ligament is especially uncommon (4-6). All the previously reported patients underwent surgical treatment (4-6), but some reports indicated that segmental omental infarction can be successfully treated conservatively (7, 8). Therefore, surgical treatment can be avoided when torsion of the lipomatous appendage of the falciform ligament is diagnosed accurately.

Herein, we reported the serial ultrasound (US) and computed tomography (CT) findings of torsion of the lipomatous appendage of the falciform ligament that was treated conservatively.

CASE REPORT

A 13-year-old boy presented with right upper quadrant (RUQ) and epigastric pain during 3 days. Physical examination revealed tenderness in the RUQ without rebound tenderness. Laboratory findings showed elevated aspartate aminotransferase, alanine aminotransferase, and direct and indirect bilirubin (3058 IU/L, 1567 IU/L, 2.2 mg/dL and 1.5 mg/dL, respectively). Neither leukocytosis nor elevated C-reactive protein was noted. The patient was referred to our institution with suspected cholecystitis and hepatitis. Longitudinal US images of the RUQ showed a non-compressible, heterogeneously hyperechoic mass-like lesion at the anterior of the falciform ligament extending along with ligamentum teres (Fig. 1). The lesion did not move with the adjacent intraperitoneal structure during respiration. Maximal tenderness

during real-time US was noted just above the lesion. Diffuse gallbladder wall edema was also noted, which was considered as secondary finding due to acute hepatitis. CT images of the upper abdomen on the same day showed about 4.9 × 3.6 × 3 cm heterogeneous, low attenuated mass-like lesion at the anterior of the falciform ligament beneath the rectus abdominis muscle. Coronal and sagittal reformatted CT images showed a close relationship between the lesion and falciform ligament (Fig. 2). The differential diagnosis included torsion of the lipomatous appendage

or tumorous condition of the falciform ligament. However, torsion of the lipomatous appendage of the falciform ligament was the preferred diagnosis because neither a cystic nor an enhancing solid mass was noted on US and CT.

The RUQ pain and tenderness was improved during the 3 day follow-up. On follow-up US, the characteristics of the mass-like lesion was changed to homogeneous hyperechogenicity (Fig. 3). The size of the lesion was slightly decreased, as compared with the previous US finding.

Two weeks later, the RUQ pain and tenderness was completely resolved on physical examination. On a follow-up US, the pre-

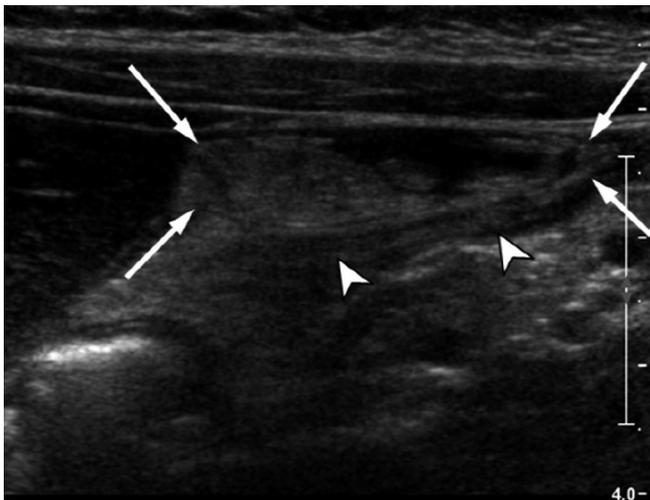


Fig. 1. Longitudinal US image of the right upper quadrant showed a non-compressible, heterogeneously hyperechoic, mass-like lesion (arrows) at the anterior of the falciform ligament (arrowheads) extending along with ligamentum teres.
US = ultrasound

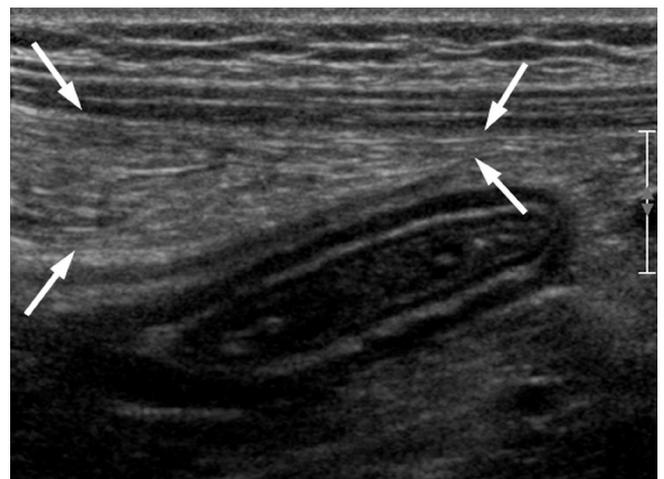


Fig. 3. In a follow-up US after 3 days, the characteristics of the lesion (arrows) was changed to homogeneous hyperechogenicity.
US = ultrasound



Fig. 2. Coronal (A) and sagittal (B) reformatted contrast-enhanced CT scans showed a heterogeneous, low attenuated, mass-like lesion (arrows) at the anterior of the falciform ligament (arrowheads). Note the lesion has a close relationship with the falciform ligament.

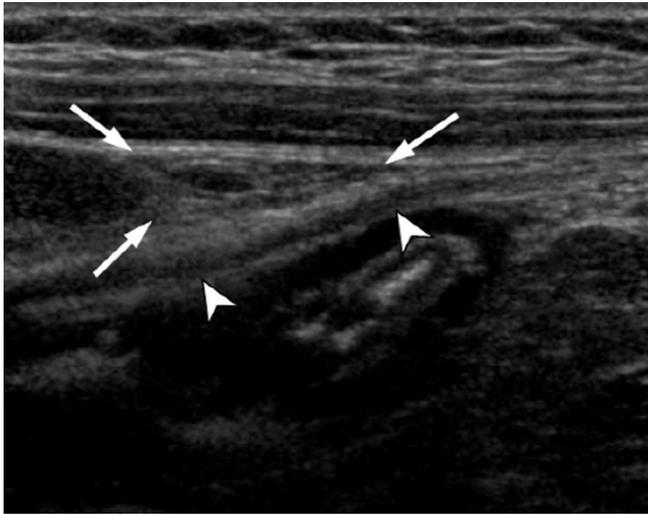


Fig. 4. In a follow-up US after 14 days, the previous lesion was almost completely resolved. The falciform ligament (arrowheads) appeared normal and scanty amount of fatty appendage (arrows) were noted. US = ultrasound

vious mass-like lesion had almost completely resolved with a scanty amount of fatty tissue remaining at the anterior of the falciform ligament (Fig. 4).

DISCUSSION

We demonstrated that in a typical case of torsion of the lipomatous appendage of the falciform ligament, the findings of serial US and CT may lead to the decision of conservative treatment. The change in echogenicity and echo pattern of the lesion for a relatively short-term period on serial US, and the poor enhancement of the lesion and its close relationship to the falciform ligament in multiplanar reformatted CT scans, confirmed the diagnosis of a benign lesion. Finally, complete resolution of the lesion on further follow-up US strongly supported the rationale for conservative treatment.

Pathologies of the falciform ligament such as cyst, lipoma, or isolated gangrene have rarely been reported previously (1-3). In our case, a cyst or lipoma of the falciform ligament could easily be differentiated by US or CT. Isolated gangrene of the falciform ligament could also be ruled out in our case due to the absence of peripheral enhancement or adjacent peritoneal infiltration on the CT scan.

Torsion of the lipomatous appendage of the falciform ligament has been reported very rarely (4-6). To the best of our knowledge, the US and CT findings of this entity were described in

only 2 case reports, which showed that real-time US and multiplanar reformatted CT images could play an important role in the accurate diagnosis of this phenomenon (5, 6). Real-time US showed a non-compressible, heterogeneous, mass-like lesion that did not move during respiration. Multiplanar reformatted CT images, especially sagittal images, can help to determine its extraperitoneal nature and demonstrate the relationship between the lesion and the falciform ligament. Coulier et al. (6) suggested that torsion of the lipomatous appendage of the falciform ligament should be considered in the differential diagnosis of intra-abdominal focal fat infarction. This entity can be differentiated from other serious diseases that require surgical treatment by its close relationship with the falciform ligament on CT and real-time US.

Recently, several reports have suggested that omental infarction and torsion of the appendage could successfully be treated conservatively (7, 8). Therefore, as with other intra-abdominal focal fat infarctions, if torsion of the lipomatous appendage of the falciform ligament could be diagnosed accurately, unnecessary operations can be avoided. In the present case, we initially decided to treat conservatively because our patient suffered from acute hepatitis. During conservative treatment, the symptom was gradually relieved and the characteristics of the lesion were changed on serial follow-up US. This implied that the lesion was more likely to be an inflammatory lesion rather than a tumorous condition. Clinical and serial US findings in our patient provided the rationale for conservative treatment.

In conclusion, torsion of lipomatous appendage of the falciform ligament can be diagnosed accurately by real-time US and multiplanar reformatted CT. Clinical and serial US findings such as the relief of symptoms or changes in lesion characteristics can aid in making appropriate decisions for conservative treatment.

REFERENCES

1. Brock JS, Pachter HL, Schreiber J, Hofstetter SR. Surgical diseases of the falciform ligament. *Am J Gastroenterol* 1992;87:757-758
2. Losanoff JE, Kjossev KT. Isolated gangrene of the round and falciform liver ligaments: a rare cause of peritonitis: case report and review of the world literature. *Am Surg* 2002;68:751-755
3. Crawford R, Anderson JR. Strangulated omental hernia of

- the falciform ligament. *Br J Surg* 1985;72:444
4. Webber CE Jr, Glanges E, Crenshaw CA. Falciform ligament. A possible twist? *Arch Surg* 1977;112:1264
 5. Lloyd T. Primary torsion of the falciform ligament: computed tomography and ultrasound findings. *Australas Radiol* 2006;50:252-254
 6. Coulier B, Cloots V, Ramboux A. US and CT diagnosis of a twisted lipomatous appendage of the falciform ligament. *Eur Radiol* 2001;11:213-215
 7. Coulier B. Segmental omental infarction in childhood: a typical case diagnosed by CT allowing successful conservative treatment. *Pediatr Radiol* 2006;36:141-143
 8. van Breda Vriesman AC, Lohle PN, Coerkamp EG, Puylaert JB. Infarction of omentum and epiploic appendage: diagnosis, epidemiology and natural history. *Eur Radiol* 1999;9:1886-1892

보존적 치료를 시행한 소아 겸상 인대 지방 부속물 염전에서의 추적 초음파 및 CT 소견

남정구 · 최성훈 · 강병성 · 김재영 · 권운정

겸상 인대 지방 부속물 염전은 매우 드문 질환으로 이전에는 대부분 수술적 치료를 시행하였다. 저자들은 초음파 및 CT를 통해 진단된 소아 환자의 겸상 인대 지방 부속물 염전에서 보존적 치료를 시행한 증례를 보고한다. 실시간 초음파 및 CT는 겸상 인대 지방 부속물 염전의 정확한 진단에 도움이 되며, 또한 추적 초음파 검사가 보존적 치료의 여부를 결정하는 데 적절한 도움을 준다.

울산대학교 의과대학 울산대학교병원 영상의학과