<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>REVIEW</td>
<td>Diet and microbiome in the beginning of the sequence of gut inflammation</td>
<td>11122</td>
</tr>
<tr>
<td></td>
<td>Ceballos D, Hernández-Camba A, Ramos L</td>
<td></td>
</tr>
<tr>
<td>MINIREVIIEWS</td>
<td>Stem cell therapy: A promising treatment for COVID-19</td>
<td>11148</td>
</tr>
<tr>
<td></td>
<td>Zheng ZX</td>
<td></td>
</tr>
<tr>
<td>ORIGINAL ARTICLE</td>
<td>Association between serum Sestrin2 level and diabetic peripheral neuropathy in type 2 diabetic patients</td>
<td>11156</td>
</tr>
<tr>
<td></td>
<td>Mao EW, Cheng XB, Li WC, Kan CX, Huang N, Wang HS, Hou NN, Sun XD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plasma brain natriuretic peptide, platelet parameters, and cardiopulmonary function in chronic obstructive pulmonary disease</td>
<td>11165</td>
</tr>
<tr>
<td></td>
<td>Guo HJ, Jiang F, Chen C, Shi JY, Zhao YW</td>
<td></td>
</tr>
<tr>
<td>Retrospective Cohort Study</td>
<td>Analysis of the incidence and influencing factors of hyponatremia before ¹³¹I treatment of differentiated thyroid carcinoma</td>
<td>11173</td>
</tr>
<tr>
<td></td>
<td>Cao JJ, Yun CH, Xiao J, Liu Y, Wei W, Zhang W</td>
<td></td>
</tr>
<tr>
<td>Retrospective Study</td>
<td>Cognitive magnetic resonance imaging-ultrasound fusion transperineal targeted biopsy combined with randomized biopsy in detection of prostate cancer</td>
<td>11183</td>
</tr>
<tr>
<td></td>
<td>Nomogram based on inflammation-related markers for predicting survival of patients undergoing hepatectomy for hepatocellular carcinoma</td>
<td>11193</td>
</tr>
<tr>
<td></td>
<td>Pu T, Li ZH, Jiang D, Chen JM, Guo Q, Cai M, Chen ZX, Xie K, Zhao YJ, Liu FB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Association of frailty with in-hospital outcomes in elderly patients with heart failure</td>
<td>11208</td>
</tr>
<tr>
<td></td>
<td>Kang YP, Chen LY, Zhu JJ, Liu WX, Ma CS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COVID-19 pandemic and exacerbation of ulcerative colitis</td>
<td>11220</td>
</tr>
<tr>
<td></td>
<td>Suda T, Takahashi M, Katayama Y, Tamano M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surgical perspectives of symptomatic omphalomesenteric duct remnants: Differences between infancy and beyond</td>
<td>11228</td>
</tr>
</tbody>
</table>
Contents

11237  Clustering cases of *Chlamydia psittaci* pneumonia mimicking COVID-19 pneumonia  

11248  Sodium nitroprusside injection immediately before balloon inflation during percutaneous coronary intervention  
Yu Y, Yang BP

11255  Machine learning approach to predict acute kidney injury after liver surgery  
Dong JF, Xue Q, Chen T, Zhao YY, Fu H, Guo WY, Ji JS

11265  Application effect for a care bundle in optimizing nursing of patients with severe craniocerebral injury  

Clinical Trials Study

11276  Influence of pontic design of anterior fixed dental prosthesis on speech: A clinical case study  
Wan J, Cai H, Wang T, Chen JY

Observational Study

11285  Real-world data on the infliximab biosimilar CT-P13 (Remsima®) in inflammatory bowel disease  
Huguet JM, Cortés X, Bosca-Watts MM, Aguas M, Martí N, Amorós C, Paredes JM

11300  Correlation of periodontal inflamed surface area with glycemic status in controlled and uncontrolled type 2 diabetes mellitus  
Anil K, Vadukkekattical RJ, Radhakrishnan C, Parambath FC

11311  Audiological characteristics and exploratory treatment of a rare condition of acute-otitis-media-associated sudden sensorineural hearing loss  
Cao X, Yi HJ

11320  Yield of testing for micronutrient deficiencies associated with pancreatic exocrine insufficiency in a clinical setting: An observational study  
Jalal M, Campbell JA, Tesfaye S, Al-Mukhtar A, Hopper AD

Prospective Study

11330  Birthing ball on promoting cervical ripening and its influence on the labor process and the neonatal blood gas index  
Shen HC, Wang H, Sun B, Jiang LZ, Meng Q

CASE REPORT

11338  Mucormycosis – resurgence of a deadly opportunist during COVID-19 pandemic: Four case reports  
Upadhyay S, Bharara T, Khandait M, Chawdhry A, Sharma BB

11346  Ductal breast carcinoma metastasized to the rectum: A case report and review of the literature  
Ban B, Zhang K, Li JN, Liu TJ, Shi J
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11355</td>
<td>De Garengeot hernia with avascular necrosis of the appendix: A case report</td>
<td>Yao MQ, Yi BH, Yang Y, Weng XQ, Fan JX, Jiang YP</td>
</tr>
<tr>
<td>11392</td>
<td>Acute myocardial infarction in a young man with ankylosing spondylitis: A case report</td>
<td>Wan ZH, Wang J, Zhao Q</td>
</tr>
<tr>
<td>11400</td>
<td>Acute appendicitis complicated by mesenteric vein thrombosis: A case report</td>
<td>Yang F, Guo XC, Rao XL, Sun L, Xu L</td>
</tr>
<tr>
<td>11406</td>
<td>Inguinal endometriosis: Ten case reports and review of literature</td>
<td>Li SH, Sun HZ, Li WH, Wang SZ</td>
</tr>
<tr>
<td>11437</td>
<td>Ectopic pregnancy implanted under the diaphragm: A rare case report</td>
<td>Wu QL, Wang XM, Tang D</td>
</tr>
<tr>
<td>11443</td>
<td>Ear ischemia induced by endovascular therapy for arteriovenous fistula of the sigmoid sinus: A case report</td>
<td>Li W, Zhang SS, Gao XR, Li YX, Ge HJ</td>
</tr>
<tr>
<td>11467</td>
<td>Rare spontaneous extensive annular intramural esophageal dissection with endoscopic treatment: A case report</td>
<td>Hu JW, Zhao Q, Hu CY, Wu J, Lv XY, Jin XH</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>11475</td>
<td>Mucinous cystic neoplasm of the liver: A case report</td>
<td>Yu TY, Zhang JS, Chen K, Yu AJ</td>
</tr>
<tr>
<td>11482</td>
<td>Retroperitoneal parasitic fetus: A case report</td>
<td>Xia B, Li DD, Wei HX, Zhang XX, Li RM, Chen J</td>
</tr>
<tr>
<td>11487</td>
<td>De novo mutation loci and clinical analysis in a child with sodium taurocholate cotransport polypeptide deficiency: A case report</td>
<td>Liu HY, Li M, Li Q</td>
</tr>
</tbody>
</table>

**LETTER TO THE EDITOR**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11504</td>
<td>Advantages and issues of concern regarding approaches to peripheral nerve block for total hip arthroplasty</td>
<td>Crisci M, Cuomo A, Forte CA, Bimonte S, Esposito G, Tracey MC, Cascella M</td>
</tr>
</tbody>
</table>
ABOUT COVER
Editorial Board Member of World Journal of Clinical Cases, Moises Rodriguez-Gonzalez, MD, Adjunct Professor, Senior Researcher, Department of Pediatric Cardiology, Hospital Universitario Puerta del Mar, Cadiz 11009, Spain. doctormoisesrodriguez@gmail.com

AIMS AND SCOPE
The primary aim of World Journal of Clinical Cases (WJCC, World J Clin Cases) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online. WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING
The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJCC as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The WJCC’s CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

RESPONSIBLE EDITORS FOR THIS ISSUE
Production Editor: Ji-Hong Liu; Production Department Director: Xu Gan; Editorial Office Director: Jin-Lei Wang.

NAME OF JOURNAL
World Journal of Clinical Cases

ISSN
ISSN 2307-8960 (online)

LAUNCH DATE
April 16, 2013

FREQUENCY
Thrice Monthly

EDITORS-IN-CHIEF
Bao-Gan Peng

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/2307-8960/editorialboard.htm

PUBLICATION DATE
December 26, 2021

COPYRIGHT
© 2021 Baishideng Publishing Group Inc
Ectopic pregnancy implanted under the diaphragm: A rare case report

Qiang-Le Wu, Xiao-Man Wang, Dong Tang

Abstract

BACKGROUND

Abdominal pregnancy is a rare type of ectopic pregnancy. We describe here a case of ectopic pregnancy implanted under the surface of the diaphragm, presenting the particular features of imaging findings from ultrasound, computed tomography (CT) and magnetic resonance imaging (MRI).

CASE SUMMARY

A 30-year-old woman presented with complaint of intermittent abdominal pain, that had begun 5 d earlier. She had no current or abnormal vaginal bleeding, and her serum human chorionic gonadotropin level (13372.08 IU/L) indicated pregnancy. Vaginal ultrasound showed a mixed echogenic mass in the right ovary. CT (plain) scan showed a curved high density mass beneath the subhepatic space. MRI scan showed a curved mixed signal, with restricted diffusion beneath the subhepatic space. Abdominal ultrasound demonstrated a mixed echogenic mass in the right lobe of the liver near the apex of the diaphragm, with a visible yolk sac and germ cell region with a bud. Subsequent laparoscopy visualized a dark red mass under the right diaphragm, which was resected completely. Histopathological examination of the resected mass confirmed an ectopic pregnancy. The recovery was swift and uneventful, and the patient was discharged to home.

CONCLUSION

Ectopic pregnancy should be in the differential diagnostic workup (via multiple imaging modalities) of childbearing woman with unexplained abdominal pain.

Key Words: Ectopic pregnancy; Diaphragmatic; Ultrasonography; Computed tomography; Magnetic resonance; Case report
INTRODUCTION

Ectopic pregnancy is rare, accounting for only 1.3%-2.4% of all pregnancies[1]. Nearly all ectopic pregnancies (95%) are tubal, with rarer locations of ectopic implantations involving the cervix, ovary and abdominal cavity[2]. We searched the English language literature from 1977 to January 2021 using the MeSH terms “ectopic”, “pregnancy”, and “non-tubal” or “abdominal”, but found only a few reports of ectopic pregnancies implanted under the diaphragm in particular.

Herein, we report a rare case of an ectopic pregnancy implanted under the diaphragm. Findings from ultrasound (US), computed tomography (CT) and magnetic resonance imaging (MRI) were key to the recognition and subsequent treatment of the condition. In the Discussion of this case report, we provide a brief review of the literature on this rare event.

CASE PRESENTATION

Chief complaints

A married, nulliparous, 30-year-old woman presented to our hospital with complaint of intermittent abdominal pain.

History of present illness

The patient reported that the abdominal pain had begun 5 d prior. History-taking revealed normal menstruation and no current or past abnormal vaginal bleeding. The last menstrual period had occurred 13 d before admission.

History of past illness

The patient’s general medical history was unremarkable. Her nulliparous status included neither vaginal nor cesarean delivery. She had no use of an intrauterine device (IUD) and had no history of pelvic inflammatory disease or pelvic surgery.

Physical examination

The patient experienced pressure pain in the upper abdomen.

Laboratory examinations

Serum human chorionic gonadotropin (HCG) concentration was elevated to pregnancy levels (13372.08 IU/L; nonpregnant levels: < 10 mIU/L).

Imaging examinations

Vaginal US found a mixed echogenic mass in the right ovary. Initially, the finding was considered to represent a corpus luteum, and the possibility of ectopic pregnancy could not be ruled out (Figure 1). In addition, a cystic lesion was found in the right adnexa and pelvic effusion was present.
Figure 1 Vaginal ultrasound showed a mixed echogenic mass in the right ovary.

CT (plain) scan revealed a curved high density mass beneath the subhepatic space, which was interpreted as hemorrhage (Figure 2).

On MRI, a curved mixed signal, mostly low in T1-weighted imaging (WI) and high in T2WI, was observed beneath the subhepatic space. Diffusion-weighted imaging (DWI) showed restricted diffusion. After administration of gadolinium (Gd), a peripheral enhanced nodal was observed within the mixed curved signal (Figure 3). In combination with the HCG laboratory finding, the presence of the nodule could not preclude the possibility of an ectopic gestational sac.

Abdominal US demonstrated a mixed echogenic mass in the right lobe of the liver near the apex of the diaphragm. The mass was approximately 5 cm × 3 cm in size, with a cystic dark area measuring approximately 1.5 cm × 1.1 cm. A yolk sac and germ cell region with a bud of approximately 0.4 cm in length was visible, as was a seemingly primitive heart tube pulsation (Figure 4).

**FINAL DIAGNOSIS**
Abdominal ectopic pregnancy.

**TREATMENT**
The patient underwent laparoscopic exploration and surgical treatment. A cyst measuring 4 cm in diameter was seen in the right ovary. The uterus, left ovary and bilateral fallopian tubes appeared normal. After removing the blood accumulated in the abdominal cavity, a mass measuring 5 cm × 3 cm, with dark red surface, was apparent under the right diaphragm. The mass was dissected completely (Figure 5).

Subsequent histopathological investigation revealed chorionic villi within the mass, with no features of abnormal trophoblastic proliferation, confirming the diagnosis of ectopic pregnancy (Figure 6).

**OUTCOME AND FOLLOW-UP**
By postoperative day 5, the patient’s HCG level had dropped substantially (to 327.58 IU/L). The patient experienced no vaginal bleeding during the postoperative recovery and was discharged to home.

**DISCUSSION**
Less than 1% of ectopic pregnancies are implanted in the abdominal cavity[3,4]. While the underlying mechanism of this abnormal condition remains unclear, some risk factors have been identified, including pelvic inflammatory disease, pelvic surgery history, use of IUD, and previous ectopic pregnancy. Ectopic pregnancy under the diaphragm is extremely rare. The symptoms of abdominal pregnancy are usually non-
Figure 2 Computed tomography plain scan showed a curved high density mass beneath the subhepatic space.

Figure 3 Magnetic resonance imaging scan showed a curved mixed signal beneath the subhepatic space, mostly low in T1-weighted imaging and high in T2-weighted imaging. Diffusion-weighted imaging showed restricted diffusion. A peripheral enhanced nodule was observed within the mixed curved signal after administration of gadolinium. T1WI: T1-weighted imaging; T2WI: T2-weighted imaging; DWI: Diffusion-weighted imaging.

specific, including abdominal or suprapubic pain, bloody vaginal discharge, and painful fetal movements. Although the beta subgroup of HCG is usually elevated in blood, some (approximately 1%) ectopic pregnancies present undetectable levels of HCG[5]. In this situation, imaging plays a more important role in diagnosis. US can detect fetal heartbeats, to make an accurate diagnosis, but its application is limited by the abdominal fat layer and gases in the intestine[6]. CT and MRI can provide more information about the tissue structure near the gestational sac; specifically, a contrast-enhanced CT and MRI will show ring-shaped intensity in ectopic pregnancy tissues[7, 8]. Our patient, described herein, was subject to vaginal and abdominal imaging examinations by US, plain CT, and contrast-enhanced MRI.

In our patient, plain CT scan showed a high density mass beneath the subhepatic space. In the related literature, Qian et al[9] reported on the enhanced-CT finding of nodular lesions at the top of the right hepatic diaphragm. Kuai et al[10] reported a case of ectopic liver pregnancy that showed a mixed density lesion within the right liver.
Figure 4 Abdominal ultrasound showed a mixed echogenic mass in the right lobe of the liver near the apex of the diaphragm. A: The mass was approximately 1.5 cm × 1.1 cm in size; B: The mass showed characteristic features of a gestational sac, with a bud of approximately 0.4 cm in length (indicated by a bright dot in the dark zone).

Figure 5 A mass measuring 5 cm × 3 cm, with dark red surface, was found under the right diaphragm on operation.

Figure 6 Histopathology findings confirmed the diagnosis of ectopic pregnancy. Chorionic villi were present within the mass, with no features of abnormal trophoblastic proliferation (black arrows).

lobe under the diaphragm on CT scan. Cai et al[11] reported the plain CT scan finding of a mass in the right hepatic lobe with a slightly low density peripheral region and an oval central portion with lower density, and the enhanced-CT scan finding of a significantly enhanced peripheral portion and nonenhanced center. In our patient, a curved mixed signal was observed beneath the subhepatic space on MRI, being mostly low in T1WI and high in T2WI, and showing restricted diffusion in DWI. After administration of Gd, a peripheral enhanced nodule was observed within the mixed curved signal. Wang et al[12] reported on a round lesion with low signal on T1WI and high signal on T2WI, and irregular mild enhancement in the venous phase. Cai et al[11] also reported on a mass in the right hepatic lobe showing increased glucose metabolism (SUVmax of 5.7) within the peripheral portion on positron emission
tomography (PET)-CT scan. Familiarity with the typical and atypical features of the various forms of ectopic pregnancies on US, CT, MRI and PET-CT will certainly help to improve the rate of accurate diagnosis.

The choices of treatment for ectopic pregnancy involve either a conservative nonsurgical approach (typically, methotrexate administration) or surgery. For example, Qian et al[9] reported a successful diaphragmatic ectopic pregnancy intervention using US-guided percutaneous microwave ablation, and Chen et al[15] described a diaphragmatic pregnancy case managed with laparoscopic management. In our case, the diaphragmatic pregnancy had ruptured, necessitating laparoscopic operation.

CONCLUSION

Diaphragmatic pregnancy is very rare and more challenging to diagnose clinically. In any childbearing-age woman presenting with unexplained abdominal pain and abdominal bleeding, it is important to take a careful history that does not overlook any childbearing-age woman presenting with unexplained abdominal pain and bleeding. It is important to take a careful history. Moreover, a combination of multiple imaging modalities could assist the diagnosis of more difficult cases, such as the rare case described herein.

REFERENCES
