

## Laparoscopic Partial Splenectomy in the Treatment of Splenic Ectopic Pregnancy (with Video)

**Ke-Xi Liao, Li Cao and Jian-Wei Li\***

Institute of Hepatobiliary Surgery, First Affiliated Hospital, Army Medical University, China

\***Corresponding author:** Jian-Wei Li, Institute of Hepatobiliary Surgery, First Affiliated Hospital, Army Medical University, 30 Gaotanyan Main Street, Shapingba District, Chongqing 400038, China, E-mail: [594457357@qq.com](mailto:594457357@qq.com)

### Abstract

**Background:** Few reports focusing on the treatment of splenic ectopic pregnancy via laparoscopic partial splenectomy, which may be technically challenging on account of vision and instrument movement limitations while facing risk of major spleen bleeding. We aim to present a video (Video S1) of a 30-year-old woman (gravida 2, para 1) undergoing laparoscopic partial splenectomy to treat splenic ectopic pregnancy.

**Methods:** The chief complaint of the patient was 64 days of menolipsis and occasional minor left upper abdominal pain. A blood test showed a serum level of  $\beta$ -human chorionic gonadotropin ( $\beta$ -hCG) of 34229 U/mL. Preoperative magnetic resonance imaging showed an approximately 5.4\*4.5\*3.9 cm gestational sac located at the lower pole of the spleen. Two days later after admission, the patient was treated with mifepristone and methotrexate to terminate pregnancy.

**Results:** The operation duration was 220 min, the intraoperative blood loss was 300 ml and no perioperative blood transfusion occurred. The abdominal drainage tube was removed on the fourth day after surgery. The patient was discharged on the sixth postoperative day without postoperative complications. Postoperative pathology examination indicated that a fetus with a length of 4 cm, 3\*3 cm grimy placenta tissue and an 8 cm umbilical cord. Histopathological examination confirmed a splenic ectopic pregnancy: chorionic villi within the splenic tissue. No positive  $\beta$ -HCG values were observed 1 month after the operation. Abdominal computed tomography and blood tests one year after surgery showed a residual spleen with favourable function.

**Conclusions:** Laparoscopic partial splenectomy for splenic ectopic pregnancy may be feasible and be associated with preserved hematopoietic and immune function.

**Keywords:** Laparoscopic; Splenic ectopic pregnancy; Partial splenectomy

## Introduction

As a rare form of abdominal pregnancy [1], splenic ectopic pregnancy can be treated by drug treatment [2] or surgical interventions, including laparotomy and laparoscopy, which focused on total splenectomy [3,4]. Previous studies [5] indicated that laparoscopic partial splenectomy is safe and feasible in selected patients. To date, few reports focusing on the treatment of splenic ectopic pregnancy via laparoscopic partial splenectomy, which may be technically challenging on account of vision and instrument movement limitations while facing risk of major spleen bleeding. We herein present a video of a 30-year-old woman (gravida 2, para 1) undergoing laparoscopic partial splenectomy performed by hepatobiliary surgeons to treat splenic ectopic pregnancy.

## Methods

A blood test showed a serum level of  $\beta$ -Human Chorionic Gonadotropin ( $\beta$ -hCG) of 34229 U/mL and her clinical manifestations were 64 days of menolipsis with occasional minor left upper abdominal pain, which indicated a high probability of ectopic pregnancy. Thus, preoperative magnetic resonance imaging was performed, which showed an approximately 5.4\*4.5\*3.9 cm gestational sac located at the lower pole of the spleen. Two days later after admission, the patient was treated with mifepristone and methotrexate to terminate pregnancy.

## Results

The operation duration was 220 min, the intraoperative blood loss was 300 ml and no perioperative blood transfusion occurred. The abdominal drainage tube was removed on the fourth day after surgery. The key point of the procedure was pre-occlusion of the splenic artery, dissection of the artery and vein of the spleen inferior pole meticulously, rational application of the Bipolar electrocoagulation (Richard Wolf GmbH, Knittlingen, Germany), “Figure-of-8 suture pattern” and thoroughly irrigation of the abdominal cavity. The patient was discharged on the sixth postoperative day without postoperative complications. Histopathological examination confirmed a splenic ectopic pregnancy: chorionic villi within the splenic tissue. No positive  $\beta$ -HCG values were observed 1 month after the operation. Abdominal computed tomography and blood tests one year after surgery showed a residual spleen with favourable function.

## Discussion

Ectopic pregnancy, defined as the implantation of a fertilized ovum outside of the uterine cavity, is associated with the estimated incidence of 19.7/1000 [2,7]. While 95.5% of the ectopic pregnancies are in the fallopian tube, only 1.3% are abdominal in location [8]. To the best of our knowledge, the spleen is one of the rarest sites for abdominal pregnancies with only 31 cases of primary splenic pregnancy having been reported worldwide, 27 of which have been documented in the English literature to date, which carries a high risk of potentially uncontrollable, life-threatening intraperitoneal bleeding at early gestation. According to previous studies, splenic ectopic pregnancy can be treated by drug treatment [2] or surgical interventions, including laparotomy and laparoscopy, which focused on total splenectomy [3,4]. It is generally acknowledged that the traditional approach to treating splenic surgical disease has been total splenectomy. Until recently, recognition of the significance of the spleen as a critical organ of the human immune system and the potential threat of perioperative bleeding and postoperative complications such as enhanced arteriosclerosis, postoperative

thrombosis and overwhelming post splenectomy infection [9-11] have led surgeons to prefer to perform parenchyma-preserving surgical procedures, for instance laparoscopic partial splenectomy.

Previous research [12] indicated that laparoscopic partial splenectomy is safe and effective in patients with focal benign splenic lesion. Laparoscopic partial splenectomy for some benign splenic diseases has been carried out in our center and the results demonstrated that it was a technically feasible approach. This case is the first report of laparoscopic partial splenectomy for splenic ectopic pregnancy. In view of the favourable general condition of the patient and the location of the gestational sac, drug treatment alone may be less effective than combining with surgical procedure. Although the lesion may be completely removed after performing total splenectomy, we cannot ignore the probability of experiencing impaired hematopoietic and immune function, further contributing to related complications, for instance postoperative thrombosis. Therefore, laparoscopic partial splenectomy was performed. The key point of the procedure was pre-occlusion of the splenic artery, dissection of the artery and vein of the spleen inferior pole meticulously, rational application of the Bipolar electrocoagulation (Richard Wolf GmbH, Knittlingen, Germany), “Figure-of-8 suture pattern” and thoroughly irrigation of the abdominal cavity.

## Conclusion

In summary, laparoscopic partial splenectomy for splenic ectopic pregnancy may be feasible when performed by experienced hepatobiliary surgeons and be associated with preserved hematopoietic and immune function.

## Acknowledgements

Ke-xi Liao and Li Cao contributed equally to this work.

## Funding Declaration

This work was supported by grants from the New Clinical Technology Project Foundation of the Southwest Hospital, Third Military Medical University (No. SWH2016JSTSYB-50).

## Statements and Declarations

**Competing interest:** The authors have no relevant financial or non-financial interests to disclose.

**Institutional Review Board (IRB) Protocol Exemption:** This study received the exemption from the Ethics Committee of the First Affiliated Hospital of Army Medical University, PLA. The procedure performed in this study involving the human participant was in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Consent to participate:** Informed consent was obtained from all individual participants included in the study.

**Consent to publish:** The participant has consented to the submission of the case report to the journal.

**Availability of data and material:** All data generated or analysed during this study are included in this manuscript and its supplementary files.

## References

1. [Julania S, Tai R. Heterotopic simultaneous splenic and intrauterine pregnancy after spontaneous conception and review of literature. J Obstet Gynaecol Res. 2013;39\(1\):367-70.](#)

2. [Kalof AN, Fuller B, Harmon M. Splenic pregnancy: a case report and review of the literature. Arch Pathol Lab Med. 2004;128\(11\):e146-8.](#)
3. [Yagil Y, Beck-Razi N, Amit A, Kerner H, Gaitini D. Splenic pregnancy: the role of abdominal imaging. J Ultrasound Med. 2007;26\(11\):1629-32.](#)
4. [Wu L, Jiang X, Ni J. Successful diagnosis and treatment of early splenic ectopic pregnancy: A case report. Medicine \(Baltimore\). 2018;97\(17\):e0466.](#)
5. [Liu G, Fan Y. Feasibility and Safety of Laparoscopic Partial Splenectomy: A Systematic Review. World J Surg. 2019;43\(6\):1505-18.](#)
6. [Center for Disease Control and Prevention \(CDC\). Ectopic pregnancy: United States, 1990-1992. MMWR Morb Mortal Wkly Rep. 1995;44\(3\):46-8.](#)
7. [Kalof AN, Fuller B, Harmon M. Splenic pregnancy: a case report and review of the literature. Arch Pathol Lab Med. 2004;128\(11\):146-8.](#)
8. [Julania S, Tai R. Heterotopic simultaneous splenic and intrauterine pregnancy after spontaneous conception and review of literature. J Obstet Gynaecol Res. 2013;39\(1\):367-70.](#)
9. [Lynch AM, Kapila R. Overwhelming postsplenectomy infection. Infect Dis Clin North Am. 1996;10\(4\):693-707.](#)
10. [Robinette CD, Fraumeni JF Jr. Splenectomy and subsequent mortality in veterans of the 1939–1945 war. Lancet. 1977;2\(8029\):127-9.](#)
11. [Schilling RF. Spherocytosis, splenectomy, strokes, and heat attacks. Lancet. 1997;350\(9092\):1677-8.](#)
12. [Wang X, Wang M, Zhang H, et al. Laparoscopic partial splenectomy is safe and effective in patients with focal benign splenic lesion. Surg Endosc. 2014;28\(12\):3273-8.](#)

### **Video S1**

Brief summary of the content: Background, patient information, preoperative examinations, intraoperative and postoperative outcomes, potential advantages of this procedure, notes regarding the process of splenic parenchyma transection.

### **Citation of this Article**

Liao KX, Cao L and Li JW. Laparoscopic Partial Splenectomy in the Treatment of Splenic Ectopic Pregnancy (with Video). *Mega J Case Rep.* 2023; 6: 2001-2004.

### **Copyright**

© 2023 Li JW. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cite.