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## CASE REPORT

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# Superior Epigastric Artery Haemorrhage Following Percutaneous Liver Biopsy

G Aberdein<sup>1</sup>, S Chokka<sup>2</sup>, KK Lau<sup>2</sup>

<sup>1</sup>Department of Radiology, Alfred Health, Richmond, Australia; <sup>2</sup>Department of Radiology, Monash Medical Centre, Melbourne, Australia

### ABSTRACT

*The use of a subcostal (or sub-xiphisternal) approach to biopsy of the left lobe of the liver is less painful and causes lower rates of pneumothorax and damage to intercostal vessels and nerves, although necessitating a steeper needle angle and deeper hepatic penetration. We report a case of superior epigastric artery haemorrhage following percutaneous liver biopsy through this approach. Emergency ligation of the left superior epigastric artery achieved haemostasis. Multi-phase computed tomography angiography may aid the detection of small bleeding from the artery. The presence of a midline extraperitoneal haemorrhage should raise suspicion of superior epigastric artery injury.*

*Key Words:* Epigastric arteries; Hemorrhage; Image-guided biopsy; Liver

## 中文摘要

### 經皮肝活檢後出現腹壁上動脈出血

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使用肋下（或胸骨底部）入路活檢肝左葉痛楚較少、氣胸率較低、肋間血管和神經損傷較少，但需要更陡的入針角度和穿透更深的肝組織。本文報告一例使用此方法經皮肝活檢後出現腹壁上動脈出血。緊急結紮左上腹動脈後成功止血。多相電腦斷層掃描血管造影有助檢測動脈小出血。中線腹膜外出血應懷疑有腹壁上動脈損傷。

### INTRODUCTION

The use of a subcostal (or sub-xiphisternal) approach to biopsy of the left lobe of the liver is increasingly popular. Compared with the right-sided approach, the subcostal approach is reportedly less painful and causes lower rates of pneumothorax and damage to intercostal

vessels and nerves.<sup>1</sup> Nonetheless, it necessitates a steeper needle angle and deeper hepatic penetration.<sup>2</sup> Of 776 parenchymal liver biopsies in a medical school over a 3-year period, 69% were through the subcostal approach.<sup>3</sup> Superior epigastric artery haemorrhage is a potential complication of this approach.

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*Correspondence:* Dr G Aberdein, Department of Radiology, Alfred Health, 5 Wangaratta St, Richmond, Australia.  
Email: georginaaberdein@gmail.com

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## CASE REPORT

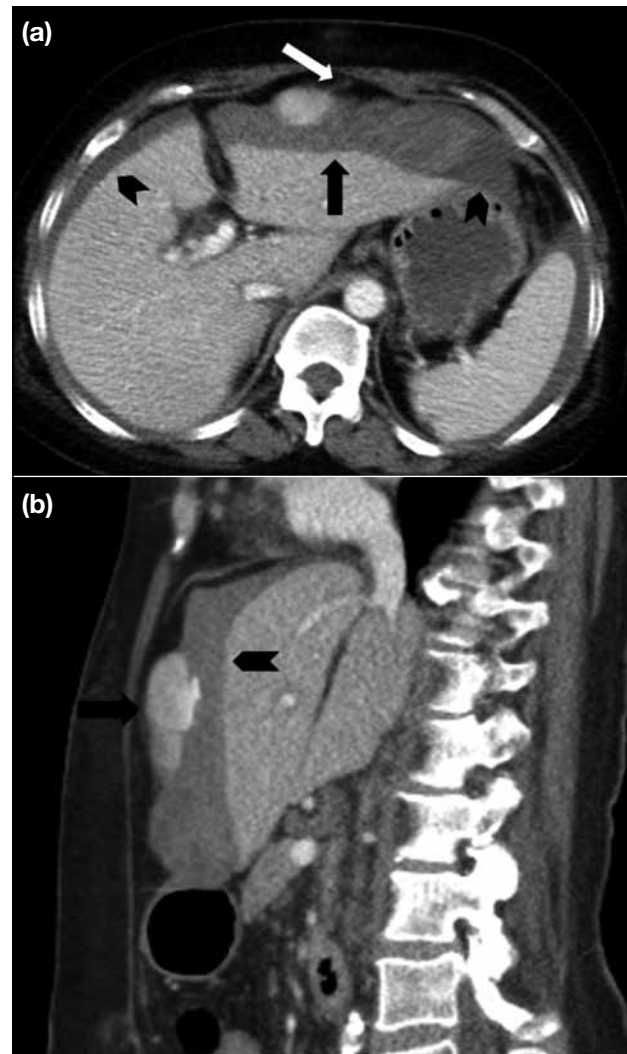
In April 2016, a 55-year-old woman with hepatic cirrhosis of unknown cause was referred to the Department of Radiology of a tertiary hospital for elective liver biopsy. A fibroscan (transient elastography) revealed possible non-alcoholic steatohepatitis. Her haematology was unremarkable, with an international normalised ratio of 1.2, haemoglobin level of 115 g/l, and platelet count of  $169 \times 10^9/l$ .

Under local anaesthesia, she underwent an ultrasound-guided non-targeted left-side liver biopsy trans-abdominally through a subcostal (or sub-xiphisternal) approach around the midline of the epigastrium, with the standard 14-gauge biopsy needle, which is routinely used for this procedure. Only one needle pass was made. The procedure was uneventful, and the patient was transferred to recovery for 4 hours of observation.

During the last hour of observation, the patient experienced epigastric pain. Iodinated contrast-enhanced computed tomography (CT) of the abdomen at the portal venous phase revealed a large haematoma in the left anterior peri-hepatic space that indented and displaced the left lobe of the liver (Figure). The blood further extended into the remaining intra-peritoneal cavity. There was a subtle focal contrast-enhancing communication between the left superior epigastric artery and haematoma suggesting an active bleed from this vessel. The patient became haemodynamically unstable after CT (systolic blood pressure of 60 mm Hg and haemoglobin level of 68 g/l) despite fluid resuscitation. Emergency ligation of the left superior epigastric artery achieved haemostasis. No further bleeding was observed postoperatively. The patient made an uneventful recovery and was discharged about a week later.

## DISCUSSION

Four cases of superior epigastric artery haemorrhage following liver biopsy using a left-sided approach have been reported.<sup>1</sup> The superior epigastric artery is located extraperitoneally, being one of the two terminal branches of the internal thoracic artery and anastomosing with the inferior epigastric artery at the level of the umbilicus. Haemorrhage from the superior epigastric artery should remain in the extraperitoneal compartment. In our patient, the presence of an intraperitoneal haematoma was anatomically unusual. The blood probably tracked along the channel created by the 14G biopsy needle into the intraperitoneal space.



**Figure.** (a) Axial and (b) sagittal iodinated contrast-enhanced computed tomography of the upper abdomen showing a haematoma in the left anterior peri-hepatic space (black arrow) that indents and flattens the anterior surface of the left lobe of the liver. The haematoma with an anterior denser component (white arrow) communicating between the left superior epigastric artery and a denser component of the intra-peritoneal haematoma (arrowheads) extends intra-peritoneally around the right lobe of the liver, spleen, and stomach.

It first accumulated in the left anterior peri-hepatic space within the left supra-mesocolic part of the intra-peritoneal cavity,<sup>4</sup> resulting in a mass effect onto the adjacent left lobe of the liver before extending into the remaining intra-peritoneal cavity.

With the increasing popularity of the subcostal approach to percutaneous biopsy of the left lobe of the liver, radiologists should be aware of the potential damage to

the left superior epigastric artery during the procedure. Multi-phase CT angiography may aid the detection of small bleeding from the artery. The presence of midline extraperitoneal haemorrhage should raise suspicion of injury to the superior epigastric artery. Surgical ligation would normally be the treatment option as the superior epigastric artery is anatomically superficial. Embolisation of the damaged superior epigastric artery can also be undertaken by an interventional radiologist using a micro-catheter through the internal thoracic artery or inferior epigastric artery.

## REFERENCES

1. Vijayaraghavan G, Sheehan D, Zheng L, Hussain S, Ferrucci J. Unusual complication after left-lobe liver biopsy for diffuse liver disease: severe bleeding from the superior epigastric artery. *AJR Am J Roentgenol.* 2011;197:W1135-9. [crossref](#)
2. Rockey DC, Caldwell SH, Goodman ZD, Nelson RC, Smith AD; American Association for the Study of Liver Diseases. Liver biopsy. *Hepatology.* 2009;49:1017-44. [crossref](#)
3. Vijayaraghavan GR, David S, Bermudez-Allende M, Sarwat H. Imaging-guided parenchymal liver biopsy: how we do it. *J Clin Imaging Sci.* 2011;1:30. [crossref](#)
4. Karthikeyan D, Chegu D. *CT abdomen: a pattern approach.* Jaypee Brothers Medical Publishers; 2007. p8. [crossref](#)