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# Laparoscopic Total Gastrectomy for Early Gastric Cancer With a Rare Positional Abnormality of the Common Hepatic Artery and Splenic Vein: A Case Report

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**Introduction:** We report a case of successful laparoscopic total gastrectomy with very rare vascular abnormality.

**Case presentation:** A 35-year-old woman was diagnosed with early gastric cancer through a medical checkup. A preoperative computed tomography scan revealed positional variation of the common hepatic artery and splenic vein. The common hepatic artery branched normally from the celiac artery, but the splenic vein was located anterior to it. The patient was successfully treated via laparoscopic total gastrectomy without surgical complications.

**Conclusion:** This vascular abnormality is extremely rare, and to our knowledge, there is no report of surgical cases with this vascular variation. Because of the difficulty in confirming the running pattern of the artery intraoperatively, it is important to ascertain the arterial running pattern preoperatively using computed tomography, including 3-dimensional angiographic imaging.

*Key words:* Gastric cancer – Vascular anomaly – Celiac artery

Laparoscopic gastrectomy is widely performed, especially for early cancer.[1] Because there are numerous anomalies of the celiac artery axis, it is very important to understand the branching variations of the celiac artery for successful lymph node dissection during gastric cancer surgery. We report a rare case of

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**Fig. 1** Gastroduodenal endoscopic examination showing a type 0-IIc lesion on the posterior wall of the greater curvature of the upper gastric body (arrows).

gastric cancer with a positional abnormality of the common hepatic artery and splenic vein.

## Case Presentation

A 35-year-old woman presented to our hospital with gastric cancer, which was detected by medical checkup. No physical abnormalities were observed, and hematologic and biochemical laboratory test findings, including CEA and CA19-9, were normal. A gastroduodenal endoscopic examination revealed a flat, elevated lesion on the posterior wall of the greater curvature of the upper gastric body (Fig. 1). Biopsy specimens obtained from the lesion were pathologically diagnosed as poorly differentiated tubular adenocarcinoma. Computed tomography (CT) revealed no abnormality in the gastric wall, no enlarged lymph node, and no distant metastasis. However, CT angiography demonstrated a locational abnormality of the common hepatic artery and the splenic vein (Fig. 2). The common hepatic artery had a U-shaped course, with an initial descending course posterior to the splenic vein, after branching from the celiac axis, and an upward course anterior to the splenic and portal veins.

The patient was treated via laparoscopic total gastrectomy and Roux-en-Y reconstruction with lymph node dissection. The splenic vein was observed in the upper margin of the pancreas, but the common hepatic artery could not be detected near the celiac trunk (Fig. 3A). In the view after the left hepatic vein had been clipped and divided, the common hepatic could be seen running down the dorsal side of the splenic vein after branching from the celiac artery. Subsequently, it moved in front of the splenic vein near the portal vein and traveled on the ventral side of the portal vein, as usual (Fig. 3B). The common hepatic artery branched into the gastroduodenal artery and the proper hepatic artery, as usual. On the upper margin of the pancreas, we carefully dissected the lymph nodes that divide the anterior surface of the splenic vein. The operation was completed uneventfully; the operative time was 449 minutes and the blood loss was 10 g. The patient

**Fig. 2** Three-dimensional reconstructions of computed tomography angiography showing the positional anomaly. The common hepatic artery (arrows) runs down the dorsal side of the splenic vein, moves in front of the splenic vein near the portal vein, and travels on the ventral side of the portal vein, as usual.

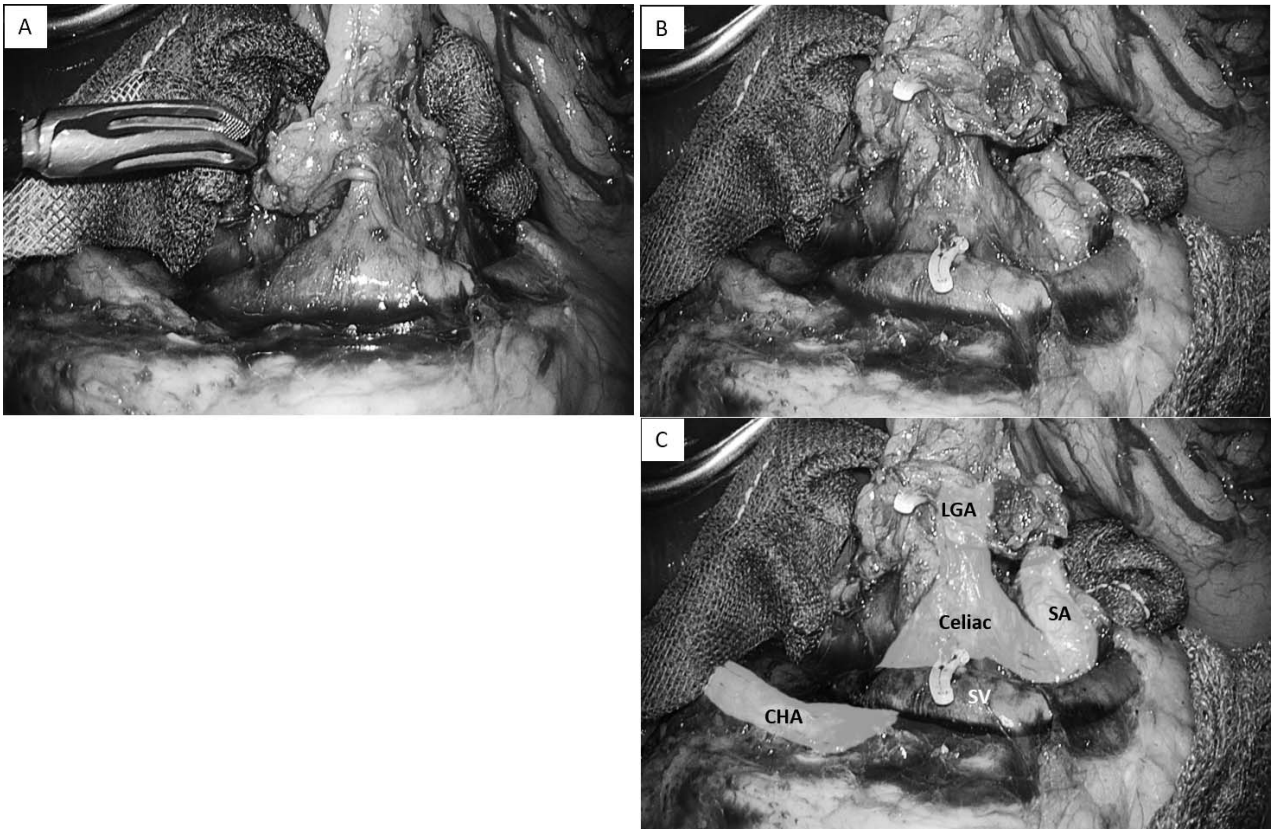


**Fig. 3** (A) The splenic vein can be observed in the superior portion of the pancreas. (B), (C) The view after the left hepatic vein had been divided. The splenic vein is located anterior to the common hepatic artery.

was diagnosed with Stage I cancer without lymph node metastasis based on pathologic examinations, and there was no cancer recurrence for 30 months.

## Discussion

Many branching variations of the celiac artery have been reported. Adachi *et al* classified the branching patterns of the celiac artery into 6 types and 28 groups based on anatomic findings in 252 cases.[2] In addition, Abdullar *et al* analyzed 932 liver transplantation cases,[3] Chen analyzed 972 anatomic cases,[4] and Song analyzed 5002 contrast-enhanced 3-dimensional (3D) CT findings,[5] and they classified the bifurcation types and running courses of the celiac axis and its peripheral arteries. In our case, the common hepatic artery branched from the celiac artery as usual, but there was an abnormality in its running course. This anomaly does not belong to any of the classifications of the aforementioned studies; thus, we consider our case extremely rare. To the best of knowledge, this is the first report of a surgical case with this vascular abnormality.

CT angiography was not routinely performed at our hospital before gastrectomy. We could not recognized this anomaly before surgery with normal horizontal CT imaging, but retrospectively it is easy to detect it with 3D-CT angiography. Chen reported CT angiography before gastrectomy exhibited guiding values in assessing blood vascular variations and shortening operation times,[6] and Ali reported CT angiography is successful to define perigastric vascular structures and reduces the risk of vascular injuries when performed before laparoscopic gastrectomy.[7] In this case, gastrectomy was completed without any vascular injury, but the splenic vein was likely to be damaged intraoperatively. We think that CT angiography is essential for a safe laparoscopic surgery, and it is considered that intraoperative complications surgery can be avoided.

## Conclusion

We report a case of laparoscopic total gastrectomy with a rare vascular anomaly. Because there may

be such a vascular anomaly, it is very important to ascertain the branching pattern of the celiac artery and the running courses of its peripheral arteries using preoperative imaging studies preoperatively.

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