Three-dimensional computed tomography analysis of the vascular anatomy of the splenic hilum for gastric cancer surgery

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Purpose: Splenic infarction may occur if the splenic branches are injured or ligated accidentally during gastrectomy. We used three-dimensional computed tomography (3D-CT) imaging to distinguish the vascular anatomy of the splenic hilum in individual patients, focusing on the splenic polar branches and the gastric branches.
Methods: The subjects of this study were 104 patients who underwent computed tomography (CT) with intravenous contrast before gastrectomy. SYNAPSE 3D® (Fujifilm Medical, Tokyo, Japan) was used to generate the 3D-CT images. The total spleen volume and the area supplied by the superior polar artery (SPA) in each patient were estimated using the "liver analysis" function.
Results: The SPA without the gastric branch (supplying only the spleen), the SPA with the gastric branch (supplying both the stomach and the spleen), and the posterior gastric artery (supplying only the stomach) were present in 14, 45, and 18% of the patients, respectively. The SPA supplied 12% of the total spleen volume on average; however, it supplied over 30% in two patients.
Conclusion: We identified the vascular anatomy around the splenic hilum in over 100 patients. Based on our findings, we recommend preservation of the SPA when it is supplying a large area of the spleen. Preoperative 3D-CT analysis provides useful information to optimize safe gastrectomy.