A giant simple hepatic cyst is an extremely rare and uncommon disease in clinical practice. Here, we report an unusual and asymptomatic female case with incidentally detected a giant simple hepatic cyst by liver dysfunction (serum $\gamma$-GTP level elevation) and non-contrast-enhanced abdominal computed tomography (CT) performed as part of a health checkup. The examinee referred to another regional hospital for further evaluation, and was clinically diagnosed with a giant simple hepatic cyst based on abdominal ultrasonography (US), contrast-enhanced abdominal CT, and magnetic resonance imaging (MRI). The case gradually showed symptomatic with abdominal discomfort at two months after a health checkup. Echo-guided percutaneous drainage using radiographic guidance was performed and ruled out biliary cystadenocarcinoma of the liver. After percutaneous drainage, the cystic size had decreased from 20 cm to 10 cm, as observed by abdominal US. The cytology of the cystic fluid was negative for malignant cells. In our case, successful decrease in size of the giant simple hepatic cyst was achieved. When we diagnose the giant hepatic cyst during screening by abdominal imaging examinations in health checkups, we should consult and refer to specialists to perform further detailed examinations and therapy in clinical practice.

**Key words** giant simple hepatic cyst, abdominal ultrasonography (US), computed tomography (CT), magnetic resonance imaging (MRI), health checkup
giant simple hepatic cyst of the right lobe of the liver. The case gradually showed symptomatic with abdominal discomfort at two months after a health checkup. Previous reports and guidelines recommended radiologic cyst aspiration and sclerotherapy with alcohol or other sclerosants, with consideration of surgery according to the size and number of cysts, and patient symptoms. Based on the literature, guidelines for the treatment of a giant simple hepatic cyst, and the patient’s preference for a less intensive therapeutic approach, the echo-guided percutaneous drainage using radiographic guidance was performed and ruled out biliary cystadenocarcinoma of the liver (Fig. 4). The drainage catheter was placed through the center of the abdomen. The amount of drainage was 2,000 mL. The next day, 1,000 mL of drainage fluid was collected. Subsequent abdominal US showed the collapse of the giant cyst. After percutaneous drainage, abdominal US showed a decrease in size of the cyst from 20 cm to 10 cm (Fig. 5). The histological finding of fluid of the cyst revealed no malignant cell. CA19-9 tumor marker was negative. The drainage volume decreased gradually that led to the removal of drainage tube. Sclerotherapy with alcohol or other sclerosants to prevent recurrence of the cyst was not performed during this initial treatment, but could be considered for a recurrence. Abdominal discomfort subsided after percutaneous drainage. Consequently, the
We showed a case presented with a giant simple hepatic cyst incidentally diagnosed based on non-contrast-enhanced abdominal CT on a health checkup.

First, regarding the modality of the diagnosis: the key to the diagnosis of a giant simple hepatic cyst is the abdominal imaging finding, especially ultrasonographic screening. Mavilia et al. reported that the strengths of various diagnostic modalities for cystic liver disease were: US with 90% of sensitivity and specificity, CT with 90% of sensitivity and >70% of specificity, and MRI with 90–100% of sensitivity and 95–100% of specificity9. Thus, collective diagnostic modalities, such as US, CT, and MRI are essential to make an accurate diagnosis of cystic liver disease.

According to the ACG (American College of Gastroenterology) guideline, large cysts (> 4–5 cm) should be performed prompt further diagnostic evaluation9. We should consult and refer to the specialists to perform further detailed examination such as contrast-enhanced CT and MRI.

It has been reported previously that the majority of benign hepatic cysts are often multiple, usually asymptomatic, only a few centimeters in size, and usually required no treatment9. Treatment becomes necessary, however, when the cysts larger than 10 cm in diameter cause pressure symptoms in the surrounding organs, or if accompanied by infection and hemorrhage, or if diagnostic imaging shows evidence of malignancy9-11. In our case, the cyst was giant, larger than 10 cm in diameter, caused pressure symptoms in the surrounding organs, but not accompanied by infection, hemorrhage, or malignancy.

Second, regarding the treatment and management guideline of cystic liver disease, medical surgical management has been recommended based on the presence of symptoms, size, the presence of infection, the compression of other organs and the rupture of the cystic liver disease6, 7. Thus, in the present case, we performed the echo-guided percutaneous drainage on radiographic guidance because of the symptomatic sign of cystic liver disease based on the previous reports, guidelines and patient’s wish6, 7. After the echo-guided percutaneous drainage on radiographic guidance was performed, cyst size had decreased from 20 cm to 10 cm in diameter. The drainage volume was 2,000 mL on day one and 1,000 mL on the following day, respectively. Moreover, abdominal US was found to be useful to evaluate therapeutic efficacy after treatment. Successful treatment resulted in reduction in size of a giant hepatic cyst. US procedure is a valuable diagnostic tool for the accurate diagnosis of a giant simple hepatic cyst and serial US examinations are important for the evaluation of therapeutic efficacy. In the future, we plan to carry out the laparoscopic hepatectomy as treatment for the progression of a giant simple hepatic cyst.

Third, a review of 106 Japanese cases of biliary cystadenocarcinoma of the liver revealed that 27 cases were from a simple cyst, 18 cases were from a cystadenoma and 24 cases from biliary cystadenoma11. The report concluded that the cancer growth occurred even in cases with simple cyst; therefore a proper follow-up strategy for any form of hepatic cyst is very important12. In conclusion, according to the ACG guideline, large cysts (> 4–5 cm) should be performed prompt further diagnostic evaluation9. It is important to consult and refer to the specialists to perform further examination such as contrast-enhanced CT and MRI.

Compliance and ethical standards

**Ethical statements:** This case study was conducted in compliance with good clinical practices and the ethical principles of the Declaration of Helsinki.

**Informed consent:** Informed consent was obtained from the patient for inclusion in this study.

**The authors state that they have no Conflict of Interest (COI).**
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