Interventional treatment of symptomatic giant hepatic hemangiomas: initial results of the use of a combined technique

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Embolization procedures were performed under conscious sedation. Initial diagnostic angiography was performed by using a 5F catheter to selectively examine the superior mesenteric artery, celiac trunk, and hepatic artery, including a late phase. A superselective technique using a 2.8F microcatheter (Progreat; Terumo Corporation, Tokyo, Japan) and 300–500 µm microparticles (Embospheres; BioSphere Medical Inc., Rockland, MA, USA) was employed to embolize the arterial branches supplying the tumor. Embolization was performed as selectively as possible, with very slow injection of the embolic agent, so that the endpoint was complete filling of the vascular sinusoids of the hemangioma with embolization material and iodinated contrast (Figure 1).

After the end of the arterial embolization procedure, percutaneous ethanol injection was performed by puncturing the center of the lesion with a 22G Chiba needle under real-time ultrasound guidance. In each procedure, 30 mL of absolute ethanol (100%) were injected. All patients received fentanyl (2 mL), ondansetron (8 mL), and a single dose of cefazolin (1 g).

Technical success was achieved in all four cases, and all of the patients were discharged from the hospital 24 h after the procedure, with only mild pain and no sign of complications. All of the patients also showed significant improvement in symptoms at the end of a three-month follow-up period. The results are summarized in Table 1.

DISCUSSION
This case series demonstrates a combined technique that, to our knowledge, has not previously been reported. In their meta-analysis, Torkian et al.6 showed that transarterial embolization with bleomycin, pinyangmycin, or ethanol, in combination with lipiodol, is a safe procedure.
that is associated with a reduction in the size of hemangiomas, resulting in symptom relief. Clinical improvement was achieved in 100% of the cases in our sample, whereas Torkian et al.\(^6\) reported that the rate of clinical improvement ranged from 63% to 100%.

**CONCLUSION**

The combination of transarterial embolization and percutaneous ethanol injection is a technique that is safe, reproducible, and easy to perform. The use of this combination appears to result in significant symptom reduction and improvement in patients with unresectable SGHHS.

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