

Ultrasound visualization of the lymphatic vessels in the lower limbs

Akitatsu Hayashi, Nobuko Hayashi, Hidehiko Yoshimatsu, Takumi Yamamoto

Background: Identification of lymphatic vessels for lymphaticovenular anastomosis (LVA), which is an effective surgical treatment for obstructive lymphedema, is important. Indocyanine green (ICG) lymphography is useful for that purpose, but is not common in many institutions. Although ultrasound is a very common modality, no research has yet underlined the feasibility of the device to detect the lymphatic vessels.

Methods: First, identification of lymphatic vessels in the lower limbs using ultrasound was performed in non-edematous limbs with linear-pattern on ICG lymphography (n=12). The imaging findings and characteristic of the lymphatic vessels in ultrasonography were investigated on transverse scans and 3-D reconstructions. Secondly, to assess the ultrasound detection technique, ICG was injected to healthy volunteers after identification and marking of the lymphatic vessels using ultrasound (n=14). Sensitivity and specificity of the examination were calculated.

Results: In the first part, the lymphatic vessels were detected by ultrasound in all cases. Characteristic ultrasonography findings of lymphatic vessels included homogeneous, hypoechoic and intermittent spicular misshapen images in all cases. In the second part, the overall sensitivity and specificity were 95.5% and 92.9%, respectively.

Conclusions: Ultrasonography can identify lymphatic vessels of the lower limbs with precision and may aid lymphatic microsurgery for lymphedema.