

Importance of contrast transthoracic echocardiography for evaluating large right-to-left shunt in patent foramen ovale associated with cryptogenic stroke

Yoichi Takaya¹, Rie Nakayama¹, Teiji Akagi², Fumi Yokohama¹, Takashi Miki¹, Koji Nakagawa², Norihisa Toh³, and Hiroshi Ito⁴

¹Okayama University Graduate School of Medicine Dentistry and Pharmaceutical Sciences

²Okayama University Hospital

³Affiliation not available

⁴Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences

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Abstract

Background: Transcatheter closure of patent foramen ovale (PFO) is an effective therapy for preventing cryptogenic stroke (CS). The identification of high-risk PFO, which is more likely to be linked to CS, is essential. This study aimed to assess the accuracy of contrast transthoracic echocardiography (TTE) for evaluating large right-to-left (RL) shunt. **Methods:** We enrolled 119 patients with or without CS who were confirmed to have PFO. The severity of RL shunt evaluated by contrast TTE and transesophageal echocardiography (TEE) was classified as follows: small (<10 microbubbles), moderate (10–20 microbubbles), and large (>20 microbubbles). **Results:** With contrast TTE, large RL shunt was observed in 94 (79%) of 119 patients, including 66 of 74 with CS and 28 of 45 without CS. With contrast TEE, large RL shunt was observed in 33 (28%) patients, including 26 with CS and 7 without CS. Contrast TTE showed large RL shunt more frequently than contrast TEE ($P < .01$). Large RL shunt evaluated by contrast TTE had a sensitivity of 89% and an accuracy of 70% for the association with CS, whereas large RL shunt evaluated by contrast TEE had a sensitivity of 35% and an accuracy of 56%. Accuracy was significantly greater in contrast TTE than in contrast TEE ($P = .02$). **Conclusion:** Contrast TTE identified large RL shunt more frequently. Large RL shunt evaluated by contrast TTE provided greater accuracy for the association with CS. Our findings suggest that contrast TTE is valuable for evaluating large RL shunt as high-risk PFO.

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