

Abstract

Background: Transcatheter closure of patent foramen ovale (PFO) has become an effective therapeutic strategy for cryptogenic stroke (CS). The identification of high-risk PFO is essential, but the data are limited. This study aimed to clarify the factors related to CS, and to develop the score of high-risk PFO.

Methods: We retrospectively analyzed 57 patients with prior CS and 50 without CS who were scheduled for transcatheter closure. PFO characteristics were evaluated by transesophageal echocardiography. Based on factors related to CS, we estimated the risk score.

Results: Patients with CS had a greater frequency of the large size PFO (≥ 2 mm of height), the long tunnel PFO (≥ 10 mm of length), atrial septal aneurysm, hypermobile interatrial septum, prominent Eustachian valve or Chiari's network, the large right-to-left shunt at rest and during Valsalva maneuver, and the low angle PFO ($\leq 10^\circ$ of PFO angle from inferior vena cava), compared with patients without CS. Multivariate analysis showed that the long tunnel PFO, the presence of hypermobile interatrial septum, the presence of prominent Eustachian valve or Chiari's network, the large right-to-left shunt during Valsalva maneuver, and the low angle PFO were independently related to CS. When the score was estimated based on 1 point for each factor, the proportion of CS was markedly elevated with the score of ≥ 2 points. The probability of CS was markedly different between scores of ≤ 1 or ≥ 2 points.

Conclusions: PFO risk can be assessed with a score based on high-risk features. The presence of 2 or more high-risk PFO features is associated with CS.

Key Words: cryptogenic stroke, echocardiography, patent foramen ovale, transcatheter closure