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CORRESPONDENCE

Residual Shunt After Patent Foramen Ovale Closure and Long-Term Stroke Recurrence

TO THE EDITOR: Deng and colleagues (1) investigated the effect of residual right-to-left shunt (RLS) after patent foramen ovale (PFO) closure on the incidence of recurrent stroke or transient ischemic attack (TIA). They concluded that the presence of residual shunting was associated with an increase in cerebrovascular events. This observation is important, and we would like to emphasize a few points.

The differential diagnosis for TIA includes other causes of transient neurologic deficits, such as migraine with aura (2). Both TIA and migraine with aura can present with similar symptoms that recede within 24 hours, and patients with both of these conditions have normal findings on brain imaging. This could help explain the similarity between the overall percentage of participants who had a recurrent TIA (20.2%) and the percentage with migraine (19.9%).

The authors thus evaluated recurrent rates of ischemic stroke and TIA individually and together and observed that all 3 end points occurred more frequently in the residual shunt group than in the no-shunt group. Residual RLS implies incomplete PFO closure and places the patient at increased risk for recurrent paradoxical embolic events. As such, the authors' results support the importance of using a device that has a high complete occlusion rate (3). Different ultrasonography-based imaging methods are available for detecting residual RLS, all of which use a bubble study. These methods include transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), and transcranial Doppler ultrasonography (TCD); however, TEE is often considered the reference standard. Conventional TTE has a low sensitivity of 46% for PFO screening compared with TEE, which implies that TTE misses a substantial number of PFOs and residual RLS (4). On the contrary, TCD has a higher sensitivity for the detection of RLS than TTE (5). This raises the likelihood that some of the post-PFO closure assessments of shunt versus no shunt were misclassified.

The current methods in randomized controlled trials for PFO-associated stroke use recurrent stroke as the efficacy outcome rather than recurrent stroke or TIA in order to avoid possibly misdiagnosing a migraine aura for TIA. We urge future investigators to continue doing so. We also recommend using TCD over TTE to assess residual shunting, which in turn will allow for conclusions based on more accurate data. These steps are especially important when assessing cerebrovascular ischemia and its dire effect on patient morbidity.

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