

Headache Toolbox

Patent Foramen Ovale (PFO) and Migraine

The foramen ovale is an opening between the top 2 chambers (atria) of the heart that is present during the development of a fetus within the womb but typically closes after birth. During fetal growth, the foramen ovale serves to bypass the developing lungs, shunting oxygen – rich blood derived from the mother’s circulation directly from the right side of the heart to the left, where it is pumped out of the heart to deliver oxygen and other nutrients to the body of the fetus.

In many individuals (as many as 25% or more), however, the foramen ovale may persist unclosed (*patent*) into adulthood. A number of studies have suggested that individuals with migraine are more likely to have a patent foreman ovale (PFO), and this association is most evident in those whose attacks of migraine may be accompanied by aura.

If there is a *causal* relationship between PFO and migraine, the mechanism by which PFO may promote migraine remains speculative. One theory is that blood components which otherwise would be screened out within the lungs are permitted by the PFO to be shunted from the right side of the heart to the left and thus to pass directly into the arteries supplying the eyes and brain; in some manner, then, one or a portion of those components possibly may serve to activate the brain process which generates migraine. Providing some support to this theory has

been the observation that closure of a PFO in a migraineur who has suffered a stroke may result in a dramatic reduction in the frequency of migraine attacks. This and other clinical observations have sparked interest in the potential usefulness of PFO closure for migraine prevention.

Closure of a PFO may be achieved via *transfemoral catheterization*, involving nonsurgical insertion of the closure device. While this procedure is *relatively* noninvasive and typically successful in the sense of achieving anatomical closure, to date we lack sufficient proof to justify performing PFO closure for migraine prevention except in the setting of well-designed and carefully supervised clinical research studies. One such study (MIST I) failed to demonstrate any benefit from closure, and its successor (MIST II) was halted due to the investigators’ inability to recruit patients at a rate sufficient to complete the study in the time allotted. At this writing, at least 2 other large-scale trials investigating PFO closure for migraine, PREMIUM and ESCAPE, are in progress. To repeat: *until these or other studies can demonstrate clear evidence of safety and benefit associated with PFO closure for migraine, that procedure cannot be considered a viable part of the therapeutic arsenal used for migraine prevention.*

John F. Rothrock, MD
Editor-in-Chief

For more information regarding the PREMIUM and ESCAPE trials, access www.clinicaltrials.gov