The Interaction Among Atrial Thromboembolism, Atrial Fibrillation, and Atrial Cardiomyopathy

I read with interest the timely paper titled *"Thromboembolism in the Absence of Atrial Fibrillation"* by Smietana et al[1] that discusses several highly important but underappreciated contributors to ischemic stroke in patients with and without atrial fibrillation (AF). Several are worthy of further emphasis and/or expansion for your readers, both investigators and clinicians. First is the recognition of the concept of atrial cardiomyopathy.[2] Atrial cardiomyopathy may be a cause and/or consequence of AF; can vary with the etiology, duration, number, and severity of associated co-morbidities as well as the amount of AF present over time (AF burden); and may be the proximate cause of thromboembolism (TE). That is, atrial anatomic, mechanical, and endothelial dysfunction may result from AF and be superimposed upon that due to co-morbidities and their severity, or may exist absent AF solely as a result of underlying co-morbidities. However, it is unusual simply from AF alone. Understanding this concept allows one to appreciate that all AF patients do not have the same thromboembolic risk; that atrial thromboembolism can occur in the absence of AF yet in proportion to the severity of the CHA2DS2-VASc score[3,4]; that TE risk is low in AF patients without co-morbidities (so-called "lone AF") but high in patients with co-morbidities plus AF and intermediate in patients with co-morbidities alone; that TE need not be temporally associated with AF yet be a consequence of AF; and that termination of AF (whether by cardioversion, drugs, ablation, and/or simple paroxysms) does not assure normalization of atrial size or function, either rapidly or at all.[5–7] In fact, postcardioversion and postablation studies have shown that atrial dysfunction may worsen despite return of sinus rhythm.[5–7] Second, but related to the first, anticoagulation of the at-risk (high risk-score) AF patient "should not be discontinued based solely upon restoration of" sinus rhythm[1] in patients with an elevated risk score. Thirdly, and again relatedly, as Smietana et al noted[1]: "The underlying substrate of the LA is critical to the pathophysiology of cardioembolic disease;" "AF is not the sole cause of thrombus formation and stroke" in patients with AF;" and "the concept of a diseased atrium. . .is fundamental to the pathogenesis of thrombus formation and ischemic stroke." To this I would add: neither AF alone nor the associated co-morbidities themselves fully explain the total risk. Rather, AF and concomitant atrial-affecting disorders must interact synergistically to magnify the risk of TE. Moreover, since both AF (burden) and co-morbidities have magnitude, magnitude synergism of contributing factors should be considered and our current risk scoring systems fall short by missing this point. Our understanding of TE risk and its association with AF has come a long way, but we can still do better. Finally, Smietana et al left out the reference to the REVEAL AF trial. I have provided it.[8]

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