Letters to the Editor

Comparison of Hemostatic Activation Created by Right- and Left-Heart Radiofrequency Catheter Ablation

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Clin Cardiol 2004;27:91–96

To the Editor:

We read with great interest the recently published trial by Charng *et al.* describing sustained elevation of the hemostatic marker in a group of patients following right- compared with left-heart radiofrequency (RF) ablation. Specifically, they found that D-dimer was elevated following ablation of the right ventricle (RV). They speculate that the elevated D-dimer resulted mainly from the central effect of RF application. However, there is another important point in relation to D-dimer elevation and ablative procedures. We would like to support their data with those from our prospective randomized study that, to our knowledge, was the first report to demonstrate a significant increase in femoral vein thrombosis following the use of multiple femoral venous sheaths without heparin in patients undergoing electrophysiologic study (EPS).¹ Our study demonstrated a significantly high incidence (62.5%) of occult deep vein thrombus during uncomplicated routine use of multiple femoral venous catheters in patients undergoing EPS. Prophylactic fixed-dose, body weight-independent low-molecular-weight heparin decreased risk of femoral vein thrombosis significantly (18%) in these patients. Thus, elevated D-dimer following RV ablation is not surprising. In our view, the elevated D-dimer should be attributed to a high incidence of occult femoral vein thrombosis related to the introducer sheath rather than to the central effect of RF application. Our data clearly show that total time of the procedure did not correlate with occurrence of thrombus, and no “safe” period for catheterization exists. The main risk factors may be catheter thrombogenicity, lack of anticoagulation, and occlusion of the lumen secondary to multiple introducer sheaths. We strongly recommend the use of prophylactic fixed-dose, body weight-independent low-molecular-weight heparin in the RV EPS procedure in light of our randomized study.

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Reference

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Author's reply:

In our article, we proposed the sustained elevation of D-dimer evidence of subclinical activation of the hemostatic system. Dr. Davutoglu raised the possibility of occult deep vein thrombosis during ventricular electrophysiologic study immediately following sheath insertion, and this phenomenon might explain the activation of the hemostatic system. In our study, however, we did not observe any patient with clinically manifested deep vein thrombosis or other evidence of acute thrombosis during or immediately after the procedure as described in the article. Data from our and other laboratories indicated that in situ thrombosis at the catheter entry sites with venous thromboembolism is a very rare complication.^{2–4} Dr. Davutoglu *et al.* reported an incredibly high incidence of deep vein thrombosis during right ventricular electrophysiologic studies (EPS). The discrepancy could be due to the following possibilities: (1) We compared hemostatic activation in patients with atrioventricular nodal re-entrant tachycardia (AVNRT) and atrioventricular re-entrant tachycardia (AVRT) in representative right-heart and left-heart procedures, respectively, because they are common supraventricular tachycardias during EPS. We did not enroll patients with ventricular procedures as described by Dr. Davutoglu. Therefore, the difference may partly result from procedures in different cardiac chambers.⁵ (2) In this study, the D-dimer levels at 48 h after radiofrequency ablation of AVNRT were significantly higher than those of AVRT with left-side accessory pathway. Multiple femoral sheath insertions and similar procedure time in both groups of patients cannot account for the sustained elevation of D-dimer in patients with AVNRT at 48 h post RF ablation. Early or delayed peaking of D-dimer after EPS has been reported due to different procedures and the illness of the patients.^{1, 6, 7} (3) We recruited only patients who were receiving no antiplatelet or anticoagulant medication during or after the ablation procedure. Therefore, we may have excluded some patients at high risk for thromboembolism—for example, patients with atrial flutter/fibrillation.

Therefore, we proposed that sustained elevation of hemostatic markers after EPS and radiofrequency catheter ablation correlate positively with the procedures in the right atrium compared with left-side procedure, which provides insight into further therapeutic and prognostic implications. A prospective, large-scale clinical trial may be warranted to establish the proper administration of antiplatelet or anticoagulant agents among various EPS procedures.

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