Dear Sir,

In their interesting narrative review about non-transpulmonary contrast echocardiography, Soliman et al. devoted a section to discuss the greater sensitivity of venous femoral injection of contrast for the detection of patent foramen ovale (PFO) as compared with venous brachial injection. This has been explained by intraatrial flow streaming, with inferior caval vein flow directed to the interatrial septum, whereas superior caval vein and coronary sinus flows are directed away from IAS. This interpretation is attractive as it matches foetal circulation, but in our opinion it has not been proved as the fundamental determining factor of the differences found between injection sites for PFO detection.

Two widely cited papers specifically aimed to test the superiority of venous femoral injection for the diagnosis of right-to-left shunt, and demonstrated greater sensitivity of femoral versus brachial venous injection of contrast for shunt detection. In addition, Schuchlenz et al. found in a third study that semiquantitative shunt evaluation after femoral injection of contrast correlated better with balloon-sized PFO diameter than after brachial injection. But none of these studies addressed specifically the grade of right atrial opacification after each injection modality. We think that greater right atrial opacification after femoral injection (owing to factors as cannula diameter and faster bolus circulation) could have played a role in the observed differences, thus being a potential confusing factor when assessing the weight of the different caval veins inflow patterns.

Lindeboom et al. showed in a well-illustrated case report the right atrial stream of flows from each caval vein. That report provides images of apical four-chamber transthoracic views after antecubital and femoral venous injection of shaken dextran, showing not only the enhanced detection of PFO by femoral contrast delivery, but also a marked shadowing artefact behind right chambers that was not present after brachial injection of contrast. This suggests that in that case right atrial opacification was much greater after venous femoral injection of contrast. A study was carried out to quantify the grade of atrial opacification after contrast delivery. Right atrial opacification was scored after sequential femoral and antecubital injections of saline contrast by means of intracardiac echocardiography. Mean grade of right atrial opacification was significantly higher after femoral injection of saline contrast. Achievement of a better-contrasted right atrium could have contributed to the observed differences. Caval inflow pattern in right atrium sure has a role in the superiority of femoral contrast injection for PFO detection, but probably its importance is lesser as compared with an optimal right atrial opacification and the performance of an effective provocative manoeuvre such as Valsalva, both of which are acknowledged as crucial in the diagnosis of PFO. Further investigations aiming to compare lower and upper limb venous injection of contrast for PFO detection should control image quality, grade of right atrial opacification, and effectiveness of provocative manoeuvres. This could help to provide simple and useful practical recommendations based on the relative merits of each one of our choices, when performing contrast echocardiography for shunt detection.

References


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