

LETTERS TO THE EDITOR

Prevention of Radial Artery Spasm: Importance of a Multifactorial Approach

We read with interest the report by Deftereos et al. (1) on significant reductions in the incidence of radial artery spasm, access site crossover, and procedure-related patient discomfort induced by the routine administration of low doses of an opioid-benzodiazepine combination during transradial coronary intervention. Although the investigators should be congratulated on their well-designed and adequately powered study, potential limitations of the study must be emphasized. One of these is related to the systematic use of a 6-F sheath for radial access. Indeed, in a large series of ultrasound measurements, Yoo et al. (2) found that the mean radial artery diameter was 2.69 ± 0.40 mm in men and 2.43 ± 0.38 mm in women, with a range of 1.15 to 3.95 mm. In that study, the proportion of patients with mean radial artery diameters < 2.52 mm (the outer diameter of a 6-F sheath) was 44% (32% in men, 60% in women). Of note, the radial sheath used in the study of Deftereos et al. (1) was the 6-F Glidesheath (Terumo Medical Corporation, Somerset, New Jersey), which has an outer diameter of 2.62 mm. Therefore, we can assume that a substantial proportion of patients included in the study had sheath-to-artery ratios > 1 which have been shown not only to increase the incidence of severe radial flow reduction but also to increase the incidence of pain during sheath insertion and removal (3,4). Moreover, the maximal catheter size used to perform coronary angiography and/or intervention in each group is not reported. Importantly, 52.1% of the study population underwent coronary angiography without ad hoc percutaneous coronary intervention. In this subset of patients, one can consider that using 5-F or even 4-F sheaths and catheters could have resulted in a substantial reduction in the rate of radial spasm. In the same way, 5-F sheaths and catheters are suitable for many noncomplex coronary interventions. Along with sedation, downsizing of radial sheaths and catheters, whenever possible, is a major strategy for reducing vascular complications during transradial access, including radial spasm. Deftereos et al. (1) also report a 34% relative reduction in the rate of access-site crossover in the treatment group, which was mainly related to a reduction in the rate of spasm. The presence of anatomical variations at the level of the upper limb arteries is a well-known cause of radial spasm and access-site crossover. However, the overall rate of these anatomical variations and their incidence in each group are not reported. An imbalance in the rate of complex arterial anatomical variations between the 2 groups could be a potential confounder and needs to be ruled out. In these situations, specific options besides sedation are advocated to reduce patient discomfort, such as careful and gentle manipulation of diagnostic and guiding catheters, the use of the smallest catheter size required to complete the procedure, and the use of hydrophilic-coated wires and catheters to cross the anatomical variations (5).

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Anxiety Score as a Risk Factor for Radial Artery Spasm During Transradial Procedures

In a recent study, Deftereos et al. (1) conclude that pre-procedural administration of opioid analgesia combined with sedation (fentanyl and midazolam) significantly reduced the incidence of radial artery spasm during transradial procedures. We agree with their findings. Recently, we conducted a study revealing the relationship between vasospasm during radial artery approach and anxiety score (2). We found that higher anxiety scores and female sex are risk factors for radial artery vasospasm during percutaneous radial interventions. Although Deftereos et al. (1) did not assess the anxiety score, their study implicates a possible role of sedation in preventing radial artery spasm during the procedure. We thought that elimination of anxiety, especially in anxious patients, by means of opioid analgesia combined with sedation (fentanyl and midazolam) could significantly decrease the radial artery spasm during transradial procedures.

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Reply

On the Relation of Anxiety to Radial Spasm and the Use of Smaller-Diameter Sheaths

Dr. Ercan and colleagues make a well-aimed comment on our paper. We agree that anxiety relief may well be one of the mechanisms underlying the effectiveness of the drug combination we used to reduce the incidence of spasm, although—as we point out in the discussion of our paper—there may also be other, more direct, mechanisms, because both these medications have been shown to have vasoactive effects. We also agree with Dr. Ercan and colleagues that this combination of an opioid analgesic with

a benzodiazepine may be particularly useful in patients with higher levels of anxiety.

We thank Dr. Aminian and colleagues for their interest in our paper. However, it is of note that the whole rationale of their letter is essentially based on a premise that is simply not accurate: they state that “52.1% of the study population underwent coronary angiography without ad hoc percutaneous coronary intervention. In this subset of patients, one can consider that using 5-F or even 4-F sheaths and catheters could have resulted in a substantial reduction in the rate of radial spasm.” The truth is that 100% of the study population underwent percutaneous coronary intervention (PCI) and 0% underwent coronary angiography without PCI. This is evident if one reads the title of our paper during transradial coronary *interventions...* (1), and it is obvious from Figure 1 (the study flow chart) that patients who did not undergo PCI were not included. It is true that 5-F sheaths can be used for some PCI procedures, but a 6-F introducer sheath is the default choice for PCI in most catheterization laboratories, as far as we know—and it could not be otherwise, because 5-F sheaths are inadequate for all but the simplest of PCI procedures. As a result, our study protocol reflects everyday practice in that respect.

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