

EDITORIAL COMMENT

Palpate-and-Stick, Still the Femoral Access Technique of Choice

Time for Change*



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At the dawn of interventional cardiology, vascular access for invasive cardiovascular procedures was very much a palpate-and-stick approach to the femoral artery. Bleeding was noted, but blood was easy to replace in a Faustian deal that allowed successful interventional outcomes. With time, the recognition of the association between bleeding and mortality fostered a variety of innovations, including closure devices, transradial access, better drug dosing, and new ideas to enhance the technique of femoral access. Most prominent in these best practices for femoral access include the use of radiography to locate the femoral head, ultrasonic localization of the optimal arterial entry site, micro-puncture techniques, and angiographic confirmation of the entry site. Although these techniques are taught in vascular access courses and appear to play a role in optimizing femoral access, the extent to which these techniques have penetrated the real world of cardiovascular practice has remained uncertain.

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In this issue of *JACC: Cardiovascular Interventions*, Damluji et al. (1) present a summary of real-world femoral practice from an international perspective. Although much is said by pundits at large cardiovascular meetings, and published guidelines exist (2), few contemporary data exist on what practitioners are doing on a day-to-day basis either in the United States or abroad. The challenge of how to obtain a snapshot of global practice is not inconsequential, but

the Internet, with its almost global reach and instant response, was the polling tool used for this survey.

Web surveys have been used before (3), but the science is uncertain and immature. The biggest advantage to researchers is the relatively low cost compared with traditional telephone and mail surveys. In addition, web-type studies eliminate bias that might be injected by the telephone interview process. The disadvantages of Internet-based surveys are the result of “nonobservation” errors (4). These are the errors that result from taking observations from only a portion of the population and can be categorized as related to coverage bias, sampling bias, and nonresponse bias.

With Internet polls, the domain of the population covered is uncertain. There is no circumscribed directory from which to define the universal population. For instance, at least until recently, one could assume that an area telephone book described the phone numbers from that area and that a random selection would be reasonably representative. Beyond the lack of directories, the geographics and penetration of the Internet within a region are uncertain, adding a poorly definable bias in sampling. Finally, how to manage nonresponse is difficult, as it is often unclear who is not responding, and therefore adjusting for nonresponse is difficult (5).

The Damluji et al. (1) survey illustrates several of these issues. Multiple international cardiovascular society e-mail lists along with conference lists were used to obtain e-mail addresses. Uncertainty exists concerning duplication or whether multiple e-mail addresses exist for the same person. Not everyone has e-mail access, whereas others might not receive requests because of local embedded spam filters or firewalls. Finally, nonresponders represent a significant issue, as >12,000 surveys were sent to produce <1,000 responses, a response rate of <10%. It is just difficult

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to get a good response rate using web-based surveys. Recognizing some of these issues associated with the underlying use of Internet surveys, one can still postulate, although not prove, that those responders were more likely younger, were more plugged in, had more access to resources such as computers, and perhaps had more interest in vascular access compared with nonresponders. If anything, the physicians responding to this poll, being internet users, might be more aware of, and biased towards, the current standards in vascular access. Given that the responses were self-reported and not objectively determined, a bias toward ideal practice might also be predicted.

Despite the inherent uncertainties in the science of web-based surveys, the reach and efficiency of the Internet result in an interesting medium to see what the real world of cardiology is doing in practice. The Damluji et al. (1) poll shows an overall preference for Judkins-type curves for catheter choice in diagnostic procedures, whereas extra-backup-type guiding catheters are preferred for interventions. This part of the survey appears consistent with common practice, which is not particularly surprising. The interesting and controversial information is found in the descriptions of vascular access techniques.

Contrary to the descriptions of optimal femoral access from cardiovascular thought leaders and various society guidelines, the practice of femoral access in the real world appears suboptimal. On the basis of the Damluji et al. (1) results, the legacy access approach of palpating and sticking the femoral artery remains the approach of choice in 60% of operators. Only 11% used fluoroscopic guidance and 27% a combination of either palpation with fluoroscopy or ultrasound. Post-access angiography was never done by 31% of the operators, and only 11% routinely used micropuncture techniques. Although the self-reported femoral access techniques outlined in this survey are at odds with contemporary state-of-the-art multimodality approaches, 84% of operators did self-estimate their femoral complication rates to be <5% across a full spectrum of clinical risk. Because recent studies continue to indicate that transfemoral access carries an access risk on the order of 5% (6), either these operators are primarily from the lower half of the complication curve, or this is an example of large-scale cognitive dissonance or denial of reality.

Damluji et al. (1) study did classify operators as femoral, radial, or both and offered some exploratory data on differences between operators. Although this stratification of the data was not the focus of the study, there is 1 interesting observation noted: those who practiced radial catheterization were more likely to use vascular imaging and smaller diameter devices for

femoral access. This observation offers a mechanistic explanation for the concept that radial operators can still have excellent femoral skills. Initially it was suggested that radial operators might lose their femoral skills, in what has come to be known as the Campeau paradox (7). Evidence for such a paradox was recently refuted in a study from the United Kingdom that showed no hazard to femoral access among cardiac catheterization laboratories with high rates of radial access use (8). With time there has been an increase in the risk profile of those undergoing catheterization, and this change in baseline risk is reflected in an increase in complications for femoral procedures. Risk adjustment shows no residual hazard for femoral access by primary radial operators. Likewise, a recent subanalysis from the SAFE-PCI (Study of Access Site for Enhancement of PCI for Women) (9) demonstrated that the use of micropuncture and ultrasonic localization was associated with the best access outcomes. Among experienced radial operators in the SAFE-PCI study, femoral access with micropuncture and ultrasound was as safe as radial access, whereas the hazard of access complications occurred within the group that had femoral access by the legacy palpate-and-stick method.

Teaching about optimal access has begun to appear at large national and international meetings. Initially, these efforts focused on teaching radial techniques as an alternative to femoral access. With the increased need for large-bore access into the femoral artery for structural heart interventions and support devices, there has been increased demand for optimal access teaching for all approaches. Given the results of this survey, there is still much work to be done. Despite confounders such as self-reporting and the non-observational error inherent in Internet polling, femoral access techniques in practice are far from optimal. This is an important study, as it is a canary in the coal mine pointing to a significant unmet need for education in modern femoral artery access techniques, and it provides impetus for quality improvement to improve the use of ultrasound imaging and other techniques to enhance vascular access. It would be a service to the community for the educational leaders at national meetings that attract invasive cardiologists to encourage vascular access training so that the latest techniques can be disseminated to the practicing community and not just remain fodder for intellectual debates.

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