
PCI via the radial artery: what is the learning curve?

MICHAEL S NORELL, ANGELA HOYE

Introduction

Assessing the process by which a new approach is adopted requires an appreciation of the climate into which that change is introduced. We are an average UK interventional centre in terms of volume (650 cases per year), under pressure to increase throughput in the face of competing demands for the time of both consultant and specialist registrar (SpR) trainee operators. We were attracted to the notion of the radial approach because we

thought that it might enhance day-case activity when the number of beds available for elective cases was declining. Although femoral arterial closure devices might also address this, our experience has indicated that their impact is less predictable. Some patients may still have to stay in hospital overnight because of a groin problem, even though the interventional procedure itself was uneventful. All our consultant operators are well trained in the Sones technique, but this procedure is itself not without

complications, and teaching this method to SpRs may not be easy in view of their increasing number of other training commitments. Teaching the radial approach represents only a slight modification of the femoral version, with which our trainees are more than familiar.

The planning

We had worked with Ferdinand Kiemeneij in Amsterdam some years ago and more recently had imposed ourselves on Jim Nolan in Stoke. The value of visiting (ideally with your nursing staff) such a centre where the radial approach is routine, cannot be underestimated. The next step is to line up cases in your own centre and invite an experienced outside operator to join you. Once the equipment is ordered and available, and the catheter lab crew and ward staff are familiar with the different procedures and new protocols, suitable cases can be planned. Sensible advice is to arrange diagnostic cases initially, importantly allowing more than sufficient time for each case. Everyone involved (managers included) has to appreciate that lab throughput will slow temporarily whilst the new approach is explored. It is always easier to find excuses not to change routine practice with which we feel comfortable. However, to enable progress to be made, eventually you have to make a decision to 'just get on and do it!'

The puncture

In our experience of more than 100 cases, this is the aspect of the technique that demands greatest attention. With femoral puncture the chances of success seem to increase with the number of attempts, established anatomical doctrine giving guidance as to the direction in which the needle should be advanced if an initial try fails to produce a rewarding arterial spurt. The opposite is true of the radial approach: here more (not less) concentration is required with each try and the radial artery, which is already small, becomes steadily smaller as vasospasm supervenes and operator confidence is sapped. The perceived wisdom is that 'the first shot is the best shot', and we would not argue with that. We have had to defer to the femoral route in only four of 110 radial attempts, and in two of these operator impatience was probably a major influencing factor. We prefer the Cook needle to the more sophisticated Arrow system. We have seen little in the way of troublesome spasm, underscoring the value of the intra-arterial 'cocktail' and a long, tapered, lubricious 6 French (6F) sheath.

Hull Royal Infirmary, Anlaby Road, Hull, HU3 2JZ.
Michael S Norell, Consultant Cardiologist
Angela Hoye, Specialist Registrar in Cardiology
Correspondence to: Dr MS Norell
(email: norellmike@aol.com)

The procedure

Once arterial access is established, a diagnostic or interventional procedure from the radial approach is almost indistinguishable from its femoral cousin. The right arm is brought alongside the patient to make life easier for all parties, particularly the operator and the radiographer, although the left lateral projection may still be problematic. An arm board extension or composite supporting table is necessary to avoid the operator having to manipulate the wire, guiding catheter or balloon in mid-air. Whilst Judkins shaped catheters are at home when employed from the femoral approach, their use from the radial origin puts them in foreign territory. They can still be utilised but alternatively Amplatz and Voda shaped catheters provide adequate backup when required, enhanced by their ability to be deeply engaged, usually without jeopardy to the proximal vessel. Importantly, catheter position is markedly sensitive to respiratory movement, and a deep breath designed to aid visibility may actually disengage the catheter from the coronary ostium.

The payoff

The value of the radial approach is obvious in the areas of sheath removal and haemostasis. The RADI Stop is an elegant device which provides localised pressure directly over the puncture site and, if applied correctly, should not produce swelling of the hand secondary to venous congestion. The sight of a patient climbing off the catheter table and being wheeled in a chair back to the ward is gratifying and signifies that, in most cases, the interventional procedure is truly completed. Once back on the ward, mobilisation needs to be encouraged to capitalise on this particularly beneficial aspect of the technique. The knowledge that the operator will not be woken in the early hours of the next morning because the patient has developed a groin problem, is an added bonus.

Conclusions

Our experience has indicated that day-case percutaneous coronary intervention (PCI) is desirable, feasible and attractive, and the radial arterial approach makes this achievable. However, issues surrounding the routine periprocedural use of glycoprotein IIb/IIIa inhibitors and the post-procedure audit of CPK or troponin still need to be resolved. It may be better to use the femoral approach for high-risk cases, bifurcation lesions and those requiring adjunctive devices, at least during a centre's early experience with the radial approach. Our view is that this approach, applied to both diagnostic and interventional activity, provides a refreshing change. There is a clear advantage to the patient, catheter lab and ward staff, and the ever-more-senior operator will be reassured to know that he is still capable of taking on change.