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LETTER TO EDITOR

The Higher Cross-over Rate from Transradial to Transfemoral Coronary Angiography

Do we have the explanation?

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هل لدينا تعليل ؟

منصور سلام وحفيظ الهادي

In our paper published in SQU Medical Journal in December 2009, we presented our early experience with radial artery catheterisation as an alternative route to the femoral artery for coronary angiography.[1] Most of our findings were compatible with many previously published papers, but there where also disagreements, especially about the cross-over rate from the radial to the femoral approach which was higher (17.1%) in our study. We pointed out, however, that the cross-over was less in the second half of the study indicating developing technical expertise, nonetheless, the figure of 17.1% was still high and required explanation.

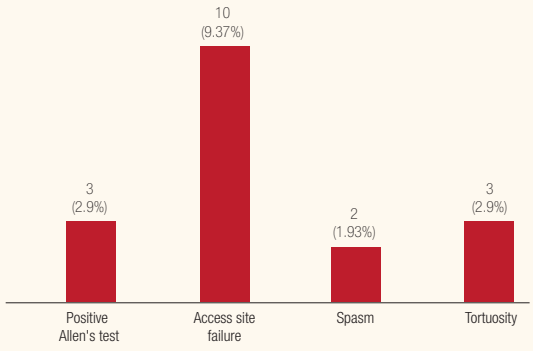

Figure 1: The various causes in numbers and (percentages) for the crossover from the radial to the femoral approach.

In our study we compared 116 patients (femoral group) with 105 patients (radial group). The reasons for the cross-over from radial to femoral are illustrated in the flow chart [Figure 1].

First, as explained below, three patients (2.9% of total patients and 17.5% of all cross-over patients) had a positive Allen's test indicative of incomplete palmar arch flow and were considered as failed procedures. The study by Greenwood *et al*. carefully assessed the relative contribution of collateral palmar circulation during 30 minutes of radial artery occlusion.[2] Their conclusion was an abnormal Allen's test is not valid as a contraindication to trans-radial cardiac catheterisation. Moreover, Ghuran *et al.* ceased screening the palmar flow (Allen's test) before radial access,[3] negating its importance as a preliminary safety test before radial artery puncture. In our study, in patients with a positive Allen's test we did not attempt the radial approach and planned straightaway for a femoral approach. These patients were erroneously considered as cross-overs from the radial to the femoral approach.

Second, ten patients in whom we failed to access the radial artery constituted the main bulk of cross-overs (58.8%). This figure was dramatically reduced in the second half of the study. These failed procedures

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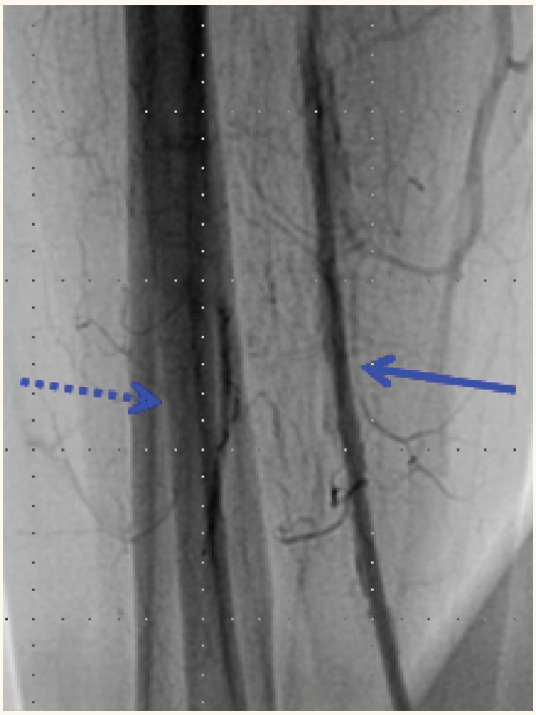

Figure 2: Dashed arrow: Radial artery is thread-like and the radial area is supplied by collateral circulation from ulnar artery (continuous arrow). It was immposible to cannulate an artery which was less than the size of the access sheath

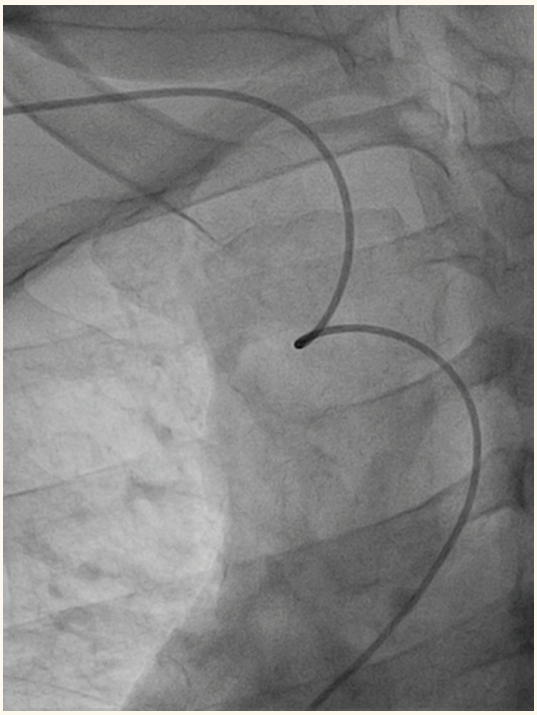

Figure 3: Markedly tortuous right subclavian artery and aortic arch. We could overcome this not uncommon anatomic finding, especially in elderly patients, by using extrasupport guidewire and asking the patient to take deep breath and hold it during catheter advancement

occurred despite improving experience and in the presence of good radial pulse. Currently, as part of an ongoing study, we are doing brachial artery angiography to assess the feasibility of using both radial and ulnar arteries as access sites for coronary angiography and intervention and to exclude procedural vascular complications. This study disclosed many anatomic variations including an absent radial artery and the radial area supplied by microvessels [Figure 2]. It would have been impossible to cannulate such radial arteries, despite the not infrequent presence of a good peripheral radial pulse. Moreover, we routinely cannulated the ipsilateral ulnar artery if we failed to engage the radial artery, definitely reducing the crossover rate from arm to groin.

Third, two patients experienced severe radial artery spasm (1.93% of total patients and 11. 7% of all crossovers). In the initial phase of the study we tended to abandon the procedure prematurely if there was severe spasm. With further experience we learned to mange this problem successfully by an additional bolus doses of the routine vasodilatory cocktail glyceryle trinitrate 200 mcg and verapamil 2.5 mg.

Fourth, three patients (2.9% of total patients and 17.5% of all cross-over) had significant vessel tortuosity [Figure 3]. Currently, we have acquired extra support exchange guide wires to overcome this problem.

In summary, we have found that the following, as possible confounding factors, led us to conclude a higher rate of cross-over from the transradial to the transfemoral approach: 1) abnormal Allen's test; 2) severe spasm; 3) severe tortousity, and 4) anatomical variation of the radial artery. The elimination of some of these patients from the study would have reduced the cross-over rate. If we apply the strategy of successful ulnar artery cannulation after failure of radial artery access, and eliminate those with positive Allen's test from the study, our rate of cross-over will be decreased further and match the international standard (from 3–8%). We have also acquired the necessary tools to overcome some of the obstacles encountered before, e.g. severe spasm and tortousity. For the time being, the radial artery approach has become the standard preferred access site method for both diagnostic and interventional coronary procedures in our institutition. Based on the last 307 procedures of radial artery catheterisations performed after the completion of the

above study, and consideration of the above factor, our current rate of cross-over is 6.8%, which is consistent with international standards (7.7%).[4]

References:

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