Complex Regional Pain Syndrome type I following radial artery cardiac catheterization

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In recent years, catheterization via the radial artery has been introduced as an alternative approach to diagnostic and therapeutic cardiac procedures. Pain in the forearm, presumably as a result of radial artery spasm, is frequently reported, and may continue for some time after termination of the procedure. We report a case of Complex Regional Pain Syndrome with the classical features of this potentially disabling condition, with a thankfully benign outcome.

A 50-year-old man underwent cardiac catheterization for unstable angina. He had an unremarkable past medical history, with the exception that a year previously, he had also been catheterized (femoral approach) for similar symptoms and was found to have mildly ectatic coronary arteries. On this admission, he was catheterized via the right radial artery after performing the Allen test. A 6F sheath was placed in the right radial artery and mild ectasia of the left anterior descending artery was demonstrated on angiography. The procedure was uneventful except for the appearance of mild right forearm pain during the catheterization. The sheath was removed and hemostasis was performed using local pressure. The pain in the forearm progressively worsened, unrelieved by rest, with the addition of extensive swelling, allodynia and coldness, cyanosis and hyperhidrosis. The radial pulse was adequately felt and Doppler examination demonstrated good flow.

The patient reported allodynia and constant burning pain in the right forearm, exacerbated by movement. Pain was regional but not with a dermatome distribution. On examination, the arm was noted to be in the guarding position, with swelling, skin discoloration, mild cyanosis, hyperhidrosis and a limited range of movement. Pain intensity was graded as 7 out of 10 on a visual analogue scale.

Quantitative sensory testing was performed and comparison of cold sensation, warm sensation detection threshold, cold pain and heat pain thresholds between right and left hand thenar area revealed significant side-to-side variation of cold and heat sensation thresholds, indicative of a significant level of cold and heat pain and allodynia, and significant levels of heat pain and hyperalgesia. These findings document heat and cold hyperalgesia without sensory loss.

The patient was treated weekly with intravenous regional anesthesia with bretylium and lignocaine. He also received non-steroidal anti-inflammatory agents, amitriptyline and underwent daily exercise therapy. After 6 weeks of intensive treatment, his symptoms disappeared.

The pathophysiology of Complex Regional Pain Syndrome type I suggests that there is sensitization of the wide dynamic range neurons in the spinal cord by altering the activity of NMDA receptors [1]. Transradial catheterization enables patients to mobilize immediately after the procedure, is often preferred by patients and has been shown to
reduce length of hospitalization, complaints of bodily and back pain, and bed, pharmacy and total hospital costs, when compared to the femoral approach [2]. Furthermore, access site bleeding complications are significantly reduced by this approach [3].

The disadvantages of the transradial approach include a relatively long “learning curve” for operators, occasional severe arterial spasm, which impairs catheter manipulation and causes local forearm pain and infrequently occurring local haematomas and loss of radial pulse [4].

It has been reported that up to 13% of radial arteries may be damaged during transradial catheterization and may therefore prohibit the artery’s subsequent use as a coronary conduit [5].

This case demonstrates the importance of a careful history and detailed physical examination of the arm, in order to exclude the possibility of CRPS, as prompt and appropriate treatment may prevent permanent damage by this potentially disabling condition.

References