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Research Letter

Propofol to relieve radial artery spasm



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A 55-year-old male patient was admitted in our hospital with retrosternal chest discomfort since 2 days. Electrocardiogram was suggestive of ischemic changes in anterior leads. The patient's heart rate was regular with rate of 88/minute and blood pressure was 110/70 mm Hg. Echocardiographically, left ventricular ejection fraction was 60% with no regional wall motion or valvular abnormality. Coronary angiogram was scheduled through right radial arterial approach. After administering 2% lignocaine local infiltration, right radial artery was punctured and guidewire was smoothly inserted in radial artery. 6 fr. arterial sheath was inserted over the wire. Before inserting coronary angiography catheter, radial angiogram was performed to rule out any radial arterial anomaly. Coronary angiography catheter 5 fr was inserted through radial arterial sheath after injecting cocktail drug solution (nitroglycerin 100 μ g, diltiazem 5 mg). Coronary angiography was performed and it revealed mid left anterior descending arterial 90% obstructive lesion. Coronary angioplasty was performed using drug-eluting stent. After the stenting procedure, as the catheter was unhooked from coronary ostium and tried to withdraw, very painful resistance to pull back was observed. Fluoroscopy did not reveal any twist or kink in the catheter. Radial artery spasm was suspected and no forceful attempt to withdraw catheter was tried. Fentanyl 50 μ g along with midazolam 1 mg was administered intravenously to the patient. However, catheter could not be pulled back. Intravenous Propofol 30 mg was administered by anesthesiologist and after a minute the catheter could be easily taken out of the radial artery without any pain. The patient's hemodynamics was stable without any respiratory depression.

Percutaneous coronary interventions through radial arterial route have decreased rates of complications and patient discomfort, early patient mobilization, and reduced length of hospital stay.¹ Radial artery spasm in transradial procedures has been reported from 4% to 20% in the literature.² Spasm of radial artery is mainly decided by amount of free space between vessel wall and sheath, pain intensity and anxiety during the procedure. Kiemeneij et al. demonstrated that force >1 kg required to remove a sheath is associated with clinically significant spasm.³ Forceful attempt to remove the sheath from spastic arteries can cause radial artery avulsion and rupture. Risk factors for radial artery spasm are female, younger age, lower body mass index, small wrist circumference, diabetes mellitus, tobacco addiction, multiple catheters exchange, >6 French catheters, and anomalies of radial artery.⁴

Administration of a vasodilator cocktail containing calcium channel blocker and/or a nitrate derivative after insertion of the radial artery sheath and use of hydrophilic catheter is commonly practiced preventive measure.^{5,6} The patient in the present case had radial artery spasm despite absence of risk factors and after giving vasodilator drugs.

Deftereos et al. showed that low doses of an opioid/benzodiazepine combination administration during transradial interventional procedures are associated with a significant reduction in the rate of spasm and patient discomfort.⁷ Vasodilatory, sedative, and analgesic effect of low doses of an opioid and a benzodiazepine has a sound pharmacobiological basis. Fentanyl can cause concentration-dependent and endothelium-independent vasodilatory effect.⁸ Midazolam attenuates the vasoconstrictive response to adrenergic stimuli⁹ and hyperpolarizes smooth muscle cells resulting in vasodilation.¹⁰ In the present case, we could not retrieve catheter despite using midazolam and opioids although these drugs were used after radial artery spasm and not before starting the procedure. Low dose of propofol was effective in removing sheath and catheter easily and smoothly. Vasorelaxation effect of propofol is due to primarily inhibition of sympathetic vasoconstrictor nerve activity, attenuation of the effects of vasoconstrictor, and antagonism of calcium channels.¹¹ Propofol may be a good choice under the circumstances of radial artery spasm due to its short half-life and rapid clearance without residual sedation.

Conflicts of interest

The authors have none to declare.

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