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Coronary artery dissection after acetylcholine administration in the absence of vasospasm: a case report

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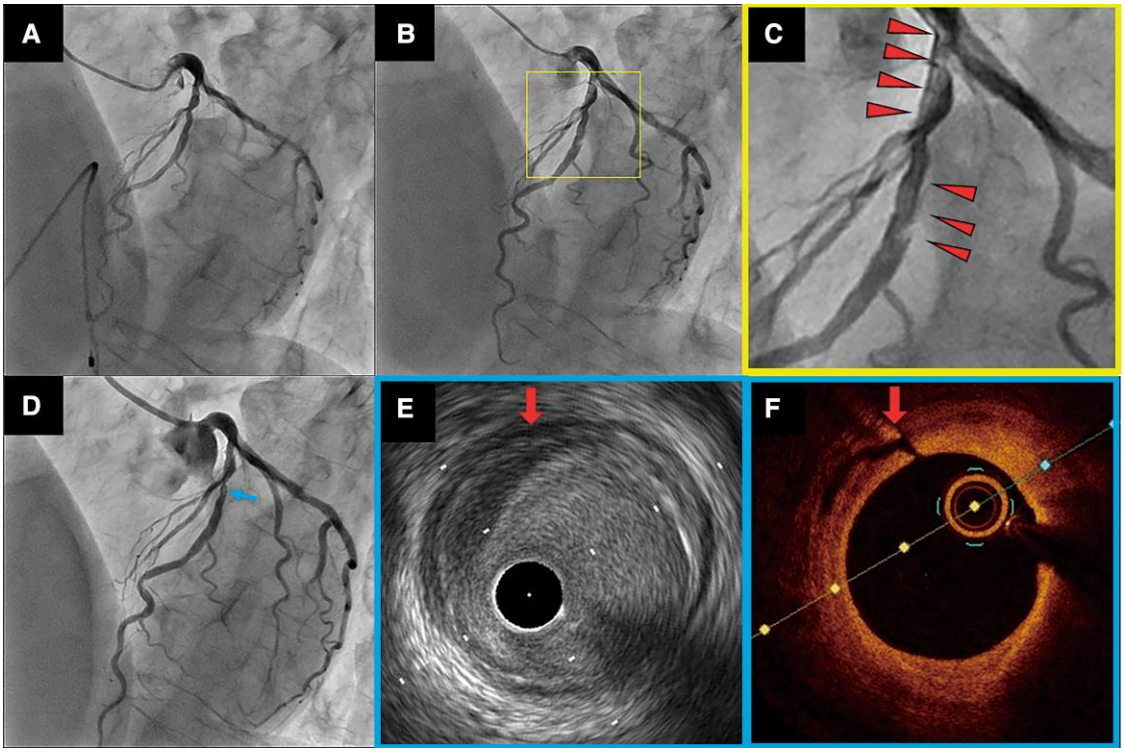

Figure 1 Coronary artery dissection after acetylcholine administration in the absence of vasospasm: (*A*) patient's coronary angiogram before acetylcholine stress test. (*B* and *C*) Patient's coronary angiogram after acetylcholine (100 mcg) administration showing coronary dissection (arrowheads). (*D*) Patient's coronary angiogram after 6 days showing healed coronary dissection. (*E*) Thrombus formation in coronary artery dissection is visible on intravascular ultrasound imaging (arrow). (*F*) Coronary artery dissection is visible on optical coherence tomography imaging (arrow).

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Case description

A 68-year-old woman with hypertension and dyslipidemia presented with intermittent chest pain at rest. Coronary angiography (CAG) showed no severe stenosis (*Figure 1A*) but mild stenosis in proximal left anterior descending artery (LAD). The patient never presented with chest pain on exertion. Furthermore, exercise electrocardiogram showed no significant changes. Therefore, we suspected coronary vasospasm. Indeed prognosis of patients with coronary vasospasm at the organic coronary stenosis site is worse;[1] therefore, we performed an acetylcholine stress test (acetylcholine was dosed incrementally from 20 to 100 mcg). It did not induce any apparent coronary artery spasm, electrocardiographic changes, or chest pain. However, based on angiographic images, coronary artery dissection of the LAD was detected (*Figure 1B and C*; see Supplementary material online, *S1*). Furthermore, the possibility of coronary artery dissection due to vasospasm was considered.

There is no consensual treatment for spontaneous coronary artery dissection (SCAD), but medical therapy may be an option in mid- or distal SCAD.[2] Therefore, we administered nicorandil (48 mg/day) for 6 days to prevent vasospasm and performed another CAG. Although blood flow was maintained (*Figure 1D*), we used intravascular ultrasound and optical coherence tomography (*Figure 1E and F*; see Supplementary material online, *S2*) to observe the lumen and confirmed the presence of coronary artery dissection and thrombus formation because of the healing process.

While the prevalence of coronary vasospasm in individuals with confirmed SCAD is not high, coronary vasospasm is associated with SCAD.[3] However, to our knowledge, there have been no reports of coronary artery dissection after acetylcholine administration in the absence of vasospasms. As this case, even if no apparent coronary spasm was induced on angiography, endothelial cell damage by acetylcholine test may induce coronary artery dissection. Therefore, we recommend being cautious about the risk of coronary artery dissection during the spasm test. This rare case presented the merits of multiple imaging devices.

Supplementary material

Supplementary material is available at *European Heart Journal – Case Reports*.

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Data availability

The data underlying this article are available in the article and in its online *Supplementary material*.

References

1. Ishii M, Kaikita K, Sato K, Tanaka T, Sugamura K, Sakamoto K, *et al.* Acetylcholine-provoked coronary spasm at site of significant organic stenosis predicts poor prognosis in patients with coronary vasospastic angina. *J Am Coll Cardiol* 2015;**66**:1105–1115.
2. Vanzetto G, Berger-Coz E, Barone-Rochette G, Chavanon O, Bouvaist H, Hacini R, *et al.* Prevalence, therapeutic management and medium-term prognosis of spontaneous coronary artery dissection: results from a database of 11,605 patients. *Eur J Cardiothorac Surg* 2009;**35**:250–254.
3. White Solaru K, Heupler F, Cho L, Kim ESH. Prevalence of coronary vasospasm using coronary reactivity testing in patients with spontaneous coronary artery dissection. *Am J Cardiol* 2019;**123**:1812–1815.