A 32-year-old woman suffering from load-dependent chest pain since 2 months was referred to our institution to rule out coronary heart disease. Nicotine abuse and hyperlipidaemia were stated in medical history. Exercise electrocardiogram generated reproducible and typical angina pectoris starting at a stress-level above 75 Watt. However, significant ST-deviation did not occur (Panel A). Echocardiography displayed normal biventricular function without regional wall motion disturbances. Because of typical load-dependent angina pectoris and present cardiovascular risk factors, left heart catheterization was scheduled. Coronary angiography showed neither coronary artery disease nor other pathological findings (Panels C and D). Because of persistent angina pectoris and risk factors, cardiac magnetic resonance imaging (CMR) was accomplished for further diagnostics. Cardiac magnetic resonance imaging at 3 Tesla revealed a subendocardial perfusion deficit within the interventricular septum at adenosine stress (140 mg/kg/min) (Panel B). Late-gadolinium enhancement as an indicator for myocardial fibrosis was not evident. Regarding these results, an intravascular ultrasound (IVUS) of the left anterior descending coronary artery (LAD) was performed. Thereby, a thrombus-loaded intimal dissection of the LAD could be illustrated (Panels E and F). Within the same procedure, a drug-eluting stent was implanted and the patient did well afterwards. This case demonstrates the usefulness of perfusion CMR in patients with suspected coronary heart disease and non-conclusive findings. Furthermore, the pivotal role of IVUS in the detection of subtle but serious coronary lesions has to be underlined.

Panel A. Exercise electrocardiogram showing no significant ST-deviation.
Panel B. Cardiac magnetic resonance imaging short-axis view with area of septal hypoperfusion (white arrow) at adenosine stress.
Panel C. Right-anterior view of left-sided coronary arteries without stenosis.
Panel D. Left-anterior view of right coronary artery without pathologicals.
Panel E. Transverse view of intravascular ultrasound showing thrombus-loaded intimal dissection.
Panel F. Intravascular ultrasound with longitudinal reconstruction of probe pullback.