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Successful Percutaneous Coronary Intervention of Coronary Chronic Total Occlusions Improves Cardiopulmonary Exercise Capacity

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The objective impact of successful percutaneous coronary intervention of a coronary chronic total occlusion on patients' symptoms and cardiac function figured out by cardiopulmonary exercise tolerance has never been investigated before. Therefore, this prospective multicenter study investigated the effect of a successful CTO-PCI on cardiopulmonary exercise testing parameters.
Patients with CTO were included and underwent cardiopulmonary exercise testing immediately before and seven months after successful CTO-PCI. All patients underwent coronary re-angiography at follow-up. The primary outcome was the change of maximal oxygen consumption (VO2max) from baseline to follow-up. Secondary endpoints consisted of changes of work rate, anaerobic threshold, oxygen pulse, NYHA and CCS classes, left ventricular function and major adverse cardiac events.
A total of 50 patients were included consecutively. Mean age was 64 years (range 40-84 years) and 46 patients were of male gender. CTOs were more common in the right coronary artery (66%) compared to the left (34%). At follow-up a significant increase of VO2max was proven (+12.25%) (p=0.001). Accordingly, anaerobic threshold (+27.87%), working rate (+13.62%) and oxygen pulse (+8.85%) increased significantly (p=0.003). Similarly, NYHA and CCS classes as well as left ventricular ejection fraction improved significantly (p=0.007).
Despite the great variety of symptoms in patients with CTOs, this study demonstrates that successful CTO-PCI improves objectified cardiopulmonary exercise capacity of the affected patients.