INTERVENTIONAL CARDIOLOGY

New insights into PCI for chronic total occlusion

Treatment of chronic total occlusion (CTO; generally defined as complete stenosis with TIMI flow grade 0) is a major challenge for interventional cardiologists. Although CTO is encountered in a high proportion of patients, percutaneous coronary intervention (PCI) is rarely attempted owing to the complexity of the procedure, low success rate, and uncertainty about long-term prognosis. Two papers published in *JACC Cardiovascular Interventions* could, however, herald a change in attitudes towards percutaneous management of CTO.

Jones *et al.* reported improved survival among patients who underwent successful PCI for CTO. Among almost 7,000 patients who chose to have PCI for stable angina between 2003 and 2010 at a single center in the UK, 11.9% had CTO. All procedures were performed using the antegrade approach; 20.3% with radial access and 72.8% with femoral access.

The rate of procedural success (restoration of TIMI flow grade ≥ 2 and residual stenosis $\leq 30\%$) was 69.6%. During follow-up (median 3.8 years, maximum 5 years), all-cause mortality was 17.2% for patients in whom PCI was unsuccessful compared with 4.5% for those who underwent successful procedures ($P < 0.0001$).

In a multivariate analysis, successful PCI was associated with a $\sim 70\%$ reduction in mortality risk (HR 0.32, 95% CI 0.18–0.58). Procedural success also reduced the

need for subsequent CABG surgery. The investigators concluded that “avoiding CTO revascularization ... on the basis of real or perceived poor success rates, unclear patient benefits, adverse outcomes, time and resource use, or need for CABG surgery may no longer be valid.”

Whitlow and colleagues investigated patient outcomes after recanalization of CTO with the novel, three-part BridgePoint Medical® (Plymouth, MN, USA) catheter and re-entry system. The FAST-CTOs trial was a prospective, multicenter study in which the researchers enrolled 147 patients with CTO in whom previous attempts at PCI had failed.

Procedural success was defined as placement of the guidewire beyond the CTO into the distal lumen. Safety was assessed by the composite end point of major adverse coronary events (MACE) at 30-day follow-up.

The procedural success rate was significantly higher for the BridgePoint Medical® system than for historical controls (77% vs 59%; $P = 0.001$). Operator experience was reflected in the success rate for the new system, which improved over time (67% for the first 75 procedures, 87% for the last 75 procedures). Fluoroscopy time was reduced by an average of ~ 10 min with the use of the system, thus limiting patient exposure to radiation.

MACE occurred in 4.8% of trial participants, a rate that did not significantly differ from that of historical

controls (6.9%). Two patients died and four experienced an asymptomatic non-ST-segment elevation myocardial infarction. Minor vessel perforations, most of which did not require treatment, occurred in 9.3% of patients. The investigators believe that “a simplified stepwise antegrade approach with both crossing and re-entry capabilities leading to improved success with shorter procedure times may enable operators to take on more complex but clinically indicated cases, particularly in the USA, where success rates and procedure times are carefully scrutinized.”

Jones *et al.* cite the upcoming Euro CTO trial of PCI versus medical therapy, which they hope will further inform the management of patients with these complex lesions.

Alexandra King

Original articles Jones, D. A. *et al.* Successful recanalization of chronic total occlusions is associated with improved long-term survival. *JACC Cardiovasc. Interv.* 5, 380–388 (2012) | Whitlow, P. L. *et al.* Use of a novel crossing and re-entry system in coronary chronic total occlusions that have failed standard crossing techniques: results of the FAST-CTOs (Facilitated Antegrade Steering Technique in Chronic Total Occlusions) trial. *JACC Cardiovasc. Interv.* 5, 393–401 (2012)