Letter to the editor

Reply to the letter of Mikael Rabaeus

We thank Dr Rabaeus for his interest in our article and wish to respond to the issues he has raised.

Primarily, the purpose of our article was not to discuss the indications for percutaneous coronary intervention (PCI) for chronic total occlusion (CTO), but to present the current methods for safe and successful CTO revascularisation based on a histopathological understanding and with the support of cardiac imaging. Nevertheless, we acknowledge Dr Rabaeus's concern, that there is an ongoing discussion as to when and on whom CTO PCI should be performed. The main reason for this ongoing debate is the lack of randomised controlled trials comparing CTO revascularisation with medical management, a fact that we do not fail to mention in the introduction of our article.

In the absence of hard evidence Dr Rabaeus suggests considering the results of the Occluded Artery Trial (OAT) [1]. Although this is a randomised trial comparing PCI for occluded arteries in combination with optimal medical therapy with optimal medical therapy alone, it cannot be applied to CTO patients. Not only does the study population differ considerably from a typical CTO population but also have the negative and unexpected results raised several important concerns.

In the first place, OAT included only subacute total occlusions, 3–28 days after myocardial infarction (MI). A CTO by definition is ≥3 months old and therefore presents with a quite different histological composition (as explained in our article) compared to a subacute occlusion (in OAT the median interval between MI and randomisation was 8 days). Indeed, spontaneous recanalisation (TIMI flow 2–3) at 1 year was observed in 25% of the medical therapy group. Furthermore, patients with left main stenosis or three-vessel disease, overt signs of heart failure, angina at rest and severe inducible myocardial ischaemia were excluded. Consequently, patients enrolled in OAT had mostly no symptoms and a relatively low-risk one- or two-vessel disease (82% had only single-vessel disease) not associated with severe inducible myocardial ischaemia. Also the definition of a successful PCI was in several ways arbitrary and may easily be challenged by newer study results. Most striking, PCI resulting in TIMI flow 1 or 2 was considered successful. Virtually all primary PCI studies have shown that TIMI flow <3 is a strong predictor of mortality and major adverse events [2, 3]. Last but not least, only 8% of the OAT patients were treated with drug-eluting stents (DES). Following OAT, several studies have demonstrated clear superiority of DES over bare metal stents, not only in acute MI [4] but also in CTO lesions [5].

Despite the absence of randomised trials, a constantly growing body of evidence from registries and observational studies showing a long-term survival advantage of revascularised CTO over failed or untried revascularisation cannot be neglected [6–10]. In addition, greater relief of angina and functional status was reported after successful CTO recanalisation [11, 12]. Consequently, current European guidelines recommend that PCI for CTO should be considered in patients with expected ischaemia reduction in a corresponding myocardial territory and/or angina relief with a class of recommendation IIa and a level of evidence B [13]. The slightly older American guidelines state that PCI of a CTO in patients with appropriate clinical indications and suitable anatomy is reasonable when performed by operators with appropriate expertise (class of recommendation IIa and a level of evidence B) [14].

In a population growing steadily older, the demand for CTO PCI is likely to increase, especially in patients who have already undergone bypass surgery. New-generation DES, novel devices and imaging modalities in combination with improved histopathological understanding, experience and refined skills of interventionalists will further increase the success and safety rates of CTO interventions. Thus, the time is ripe for randomised trials such as the upcoming DECISION-CTO trial or the EuroCTO trial, comparing CTO PCI using DES with optimal medical therapy alone. In the meantime we hope that our article has provided insight into the recent developments in CTO PCI, offering optimal and safe treatment of these challenging lesions.

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References

The reference list is available in the online version of this letter.

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