Distal embolization during primary percutaneous coronary interventions

Primer perkütan koroner girişim sırasında distal embolizasyon

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Primary percutaneous coronary intervention (p-PCI) significantly improves myocardial perfusion and survival after acute ST-segment elevation myocardial infarction (STEMI). However, despite the recent technical improvements in PCI, embolization of atherosclerotic and thrombotic material in the coronary circulation often occurs, as detected by coronary angiography. Angiographically visible distal embolization was defined as a filling defect with abrupt cutoff in the distal vessel of the culprit lesion at any stage during PCI without evidence of dissection, stenosis or vasospasm. This angiographically visible distal embolization of thrombus and plaque debris has been reported in 6% to 18% of patients with STEMI treated with PCI, and was associated with impairment of myocardial perfusion, impaired microvascular perfusion and poor outcome. Patients with distal embolization showed higher all-cause mortality and cardiac mortality rates than patients without distal embolization.[1-4]

Previous studies have demonstrated that the presence of an intracoronary thrombus at the lesion site and plaque volume and composition are associated with distal embolization in patients with STEMI.[3-5] Other studies showed that thrombus composition and size were associated with distal embolization, and large and erythrocyte-rich thrombi were associated with poor myocardial perfusion.[4,6] Similarly, in a study[7] published in 2013 in the Journal of the American College of Cardiology (JACC): Cardiovascular Interventions, Yunoki et al. reported an association between pathological characteristics of aspirated intracoronary thrombi and the incidence of distal embolization. Pathological analysis revealed that an erythrocyte-rich component in the aspirated thrombi was associated with the incidence of distal embolization. Moreover, glucose level on admission, larger vessel diameter and predilation were independent predictors for distal embolization.

The recent meta-analysis using aspiration thrombectomy devices has demonstrated that the use of these devices significantly reduced the incidence of distal embolization and improved myocardial perfusion and clinical outcome when compared with conventional PCI alone.[8] The INFUSE-AMI (Intracoronary Abciximab and Aspiration Thrombectomy in Patients with Large Anterior Myocardial Infarction) Trial[9] compared intracoronary bolus of abciximab versus no abciximab, and manual thrombus aspiration versus no aspiration. Intracoronary abciximab and manual thrombus aspiration further reduced infarct size and microvascular obstruction.

In this issue of Archives of the Turkish Society of Cardiology, Oduncu et al.[10] presented predictors and long-term prognostic significance of angiographi-
cally visible distal embolization during p-PCI. Distal embolization was found as 6.5% in that study. Their outcomes are in accordance with those of the recent relevant publications and meta-analyses. An important limitation of this study is the fact that thrombus aspiration was not performed routinely. The use of a mechanical device for thrombus removal to improve clinical outcomes and the efficacy of these devices have been tested in many clinical trials.[11-14] In the 2013 American College of Cardiology/American Heart Association guidelines for the management of patients with STEMI, thrombus aspiration received a Class IIa, Level of Evidence: B recommendation.[15] Based on the finding, if not anatomically contraindicated, an adjunctive manual thrombectomy device should be widely and routinely used in STEMI patients undergoing p-PCI. If more patients underwent thrombus aspiration, more information could be gleaned about which of the other related factors was more associated with distal embolization. Ideally, we would have liked to see a comparison of patients in whom thrombus aspiration was versus was not attempted.

In conclusion, technical developments in PCI and aspiration catheters used during PCI are among the treatment approaches in both the normalization of coronary flow and improvement in tissue perfusion. In the future, decreased distal embolization might be an effective target point for the prevention and treatment of myocardial infarction.

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REFERENCES