Antithrombotic therapy after coronary stenting – how much and for how long?

By Dr Eric Yamen, Cardiologist.

About the Author

Eric Yamen graduated from UWA with honours in 1998. He trained in clinical cardiology at Sir Charles Gairdner Hospital before completing fellowships in interventional cardiology (coronary angioplasty) at Concord Hospital in Sydney and Stanford University Medical Centre.

He has a clinical appointment a Sir Charles Gairdner Hospital. Eric's interests include management of complex coronary disease by angioplasty, and minimally invasive therapies for atrial septal defects, patent foramen ovale, hypertrophic cardiomyopathy and valvular heart disease. He consults at Subiaco, Applecross and Mandurah.

Percutaneous coronary intervention (PCI) with stenting is a commonly performed cardiac invasive procedure, performed for both stable angina and acute coronary syndromes (ACS). Cardiologists are frequently asked for information about duration and intensity of antithrombotic therapy following PCI; this summary aims to address some of these questions.

Background

During PCI, the coronary stent is deployed into the vessel wall at high pressure. Over a period, the endothelium heals over the device and the stent is fully embedded within the vessel wall. Until this endothelialisation occurs, the metal stent struts are exposed to the circulating blood providing a potential nidus for thrombosis. Stent thrombosis is a catastrophic event, with mortality approaching 50%. Before endothelialisation occurs, thrombosis risk is minimised by administration of dual antiplatelet therapy (DAPT), usually aspirin plus clopidogrel.

Bare metal vs. drug eluting stents

The endothelialisation of metal stents usually occurs over the first 4 weeks, but can result in excessive intimal hypertrophy leading to re-stenosis, particularly in diabetics and patients with small vessels or long lesions. This process may lead to recurrent angina or even ACS, and often requires repeat coronary intervention or even bypass surgery. Stents coated with a polymer and anti-restenotic drug (drug-eluting stents, DES) were designed to reduce this problem. Five DES are currently available in Australia: Cypher (Cordis), Taxus, Promus (Boston Scientific), Xience (Abbott) and Endeavor (Medtronic). The drawback of DES stems from their anti-restenotic properties: delayed endothelial coverage means a longer period of strut exposure and potential for stent thrombosis. In order to reduce this risk, DAPT is recommended for at least 12 months after DES insertion, compared to a minimum of 4 weeks after bare metal stent implantation. In certain scenarios, e.g. complex stenting, left main stent or previous stent thrombosis, DAPT will be continued indefinitely. In all patients with a coronary stent, after the DAPT period is completed, one agent should be continued indefinitely.

Which anti-platelet agent?

DAPT consists of low dose aspirin plus a second platelet inhibitor. The second agent is an ADP antagonist, most commonly clopidogrel, which may be given in a combined formulation (e.g. CoPlavix, Sanofi-Aventis). Ticlopidine is now rarely used because of idiosyncratic neutropaenia. Prasugrel (Effient, Lilly) is a new ADP antagonist which is a more effective antithrombotic agent than clopidogrel but is associated with more bleeding; this is used in select patients after ACS, and virtually always is initiated in hospital. Ticagrelor is a reversible platelet inhibitor which will be available in Australia in the next 18 months. Dipyridamole should not be used after coronary stenting due to a lack of effectiveness.

What if my patient needs a procedure?

If a patient undergoing PCI is known to require an invasive non-cardiac procedure in the next 12 months, the cardiologist will usually plan to implant a bare metal stent in order to reduce the duration of DAPT. The procedure should then take place more than 4 weeks after PCI while the patient takes a single agent, usually aspirin. In some cases of bare metal stenting, for example after an ACS, DAPT may be continued for longer than 4 weeks; in these instances the cardiologist should be consulted before the patient undergoes elective surgery.

A more complex problem occurs when a patient requires unplanned surgery after DES implantation, particularly in the first 12 months. Where possible, elective procedures should be postponed until this period is complete. In instances where this is not possible, the risk of stent thrombosis should be weighed against the risk of surgical bleeding. The treating cardiologist should be consulted in these instances.

What if my patient needs warfarin?

Patients with previous stents often have an indication for anticoagulation, e.g. atrial fibrillation or previous venous thrombosis. A combination of DAPT plus warfarin (triple therapy) has a very high rate of serious bleeding. Where possible, a bare metal stent is implanted and triple therapy limited to 4 weeks. If a patient develops an indication for warfarin in the first 12 months after DES implantation, the treating cardiologist should be consulted prior to its commencement. It is my practice to use a proton pump inhibitor in all patients on triple therapy.

Summary

Dual antiplatelet therapy is mandatory for all patients undergoing coronary stenting.

DAPT should be continued for at least 4 weeks after implantation of a bare metal stent, and for at least 12 months after drug eluting stent implantation. One agent should be continued indefinitely after this time.

In patients with previous stents, consult with the treating cardiologist before ceasing antiplatelet agents or adding warfarin.

References available on request. Conflicts of interest: none.