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Letters

TO THE EDITOR

No Wire Fracture Is Great News, But Is Polymer Shearing the Real Danger?

We read with great interest the paper by Pan et al. (1) investigating the safety of jailing polymeric versus nonpolymeric wires while treating coronary bifurcations. They are to be commended for conducting a randomized study regarding a quintessential question that many interventional cardiologists wanted an answer to. The authors prove that jailed wires with a polymer cover are easier to retrieve and have less structural damage when compared with wires with no polymer cover.

However, as the excellent editorial by Nicholson (2) points out, there are multiple wires available with varying degrees of polymer coatings (hydrophilic/hydrophobic) and covers/jackets. It is reasonable to thus classify wires into: 1) wires with only coating, but no cover, for example, HT-BMW (Abbott Vascular, Santa Clara, California), HT - Floppy I and II (Abbott Vascular), and Prowater (Asahi/Abbott Vascular, Santa Clara, California); 2) wires with coating as well as intermediate polymer cover, for example, HT-BMW Universal I and II (Abbott Vascular), and Terumo Runthrough NS (Terumo Interventional Systems, Somerset, New Jersey); and 3) wires with coating as well as a full-length polymer jacket, for example, HT-Whisper (Abbott Vascular) and HT-Pilot (Abbott Vascular). In our experience, the second category is the workhorse wire for a majority of operators and the go-to wires for side branch protection also.

The major concern regarding wires with full-length polymer jackets has been manifest or occult polymer shearing. This paper fails to address this question because the microscopic examination used is not sensitive enough to detect damage to the polymer jacket. The magnifications used were only up to 6.3×, which is unable to detect small pieces of missing polymer. Grundeken et al. (3) have shown that microscopic polymer shearing occurs in 45% of patients even from nonjailed wires, hence one can only imagine what jailing a polymer-jacketed wire and then pulling it from underneath a stent strut does to the polymer jacket. In our small pilot study of 30 wires examined with a scanning electron microscope (4), there was almost 5-fold higher polymer damage in polymer-jacketed wires (HT-Whisper) versus intermediate polymer covered wires (Runthrough NS). Polymer shearing indices were weakly correlated with creatine kinase myocardial band levels post-procedure also. A retrospective analysis of our institution's bifurcation interventions also raised questions about the relationship of procedural myocardial infarction and jailed polymer-jacketed wires (5).

Thus, although this study is very illuminating in the differences of wire fracture between polymer-jacketed and nonjacketed wires, we would like to advise caution in changing one's practice until better evidence regarding polymer shearing and its significance is available. It may also be worthwhile to investigate whether the intermediate polymer covered wires are a good compromise for lubricity while minimizing the risk of polymer shearing.

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REPLY: No Wire Fracture Is Great News, But Is Polymer Shearing the Real Danger?

We thank Drs. Chatterjee and Leesar for their interest in our paper (1). Although we agree with them regarding the fact that electron microscopy technique is able to detect a higher extent of polymer damage than stereoscopic microscopy in jailed wires, we do not know whether these small changes have a clinical impact. The concern of wire damage and embolization of the polymer to microcirculation is not a specific problem of percutaneous coronary intervention in bifurcation lesions and may occur in any type of percutaneous intervention (2). Despite this, polymer-coated wires are widely used around the world and they represent the 29% of wires sales in Europe (Abbott Vascular). In our study, we cannot assess distal embolization of hydrophilic-coating material because it is a clinical, not a pathological study. However, we did not observe harmful consequences of this possible complication described by Grundeken et al. (2), in terms of myocardial damage. Thus, post-procedure troponin (Tp) levels were similar between polymer-coated and non-polymer-coated wire groups (3 ± 7 IU/l vs. 4 ± 9 IU/l), as well as the incidence of relevant (Tp >70 times upper limit: 1% vs. 2%) and nonrelevant (Tp >5 times upper limit: 7.8% vs. 7.5%) myocardial infarction (1).

During the last years, avoiding polymer-coated wires in the jailed wire technique has been the general recommendation (3,4). Our study is the first randomized comparison between these 2 types of wires and our results suggest a change in this old concept.

Regarding the use of different degrees of polymer coatings or intermediate polymer cover wires, we also agree with Chatterjee and Leesar that these types of wires should be tested in this indication. Therefore, in the perspectives of our paper (1), we specified that the next step in this research line should be to test new-generation wires (as that mentioned in the letter) from different companies for this indication.

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Subclinical Leaflet Thrombosis in Bioprosthetic Aortic Valves

Neuss et al. (1) report a case of fatal thrombotic occlusion of the left main trunk after transcatheter aortic valve replacement (TAVR). The 81-year-old patient was previously successfully treated with a Portico valve (St. Jude Medical, St. Paul, Minnesota) for severe aortic stenosis. Post-procedural antithrombotic treatment included 6 months dual antiplatelet followed by monotherapy with aspirin. After 2 years without symptoms, the patient developed acute chest pain and shock. Echocardiography showed globally impaired left ventricular systolic function, but normal aortic valve function. Coronary angiography revealed thrombotic occlusion of the left main stem, and a contrast defect on the aortic root injection was interpreted as a large thrombosis on the bioprosthetic aortic valve.

The authors correctly state that clinical thrombosis on transcatheter bioprosthetic aortic valves is rare. Latib et al. (2) reported 26 cases (0.61%) of transcatheter heart valve thrombosis among 4,266 patients. These patients were symptomatic and often had an increased transvalvular gradient. This is in contrast to subclinical leaflet thrombosis, which may be seen as hypoattenuated leaflet thickening (HALT) on computed tomography (CT) scanning in up to 40% of patients with bioprosthetic aortic valve (3).