

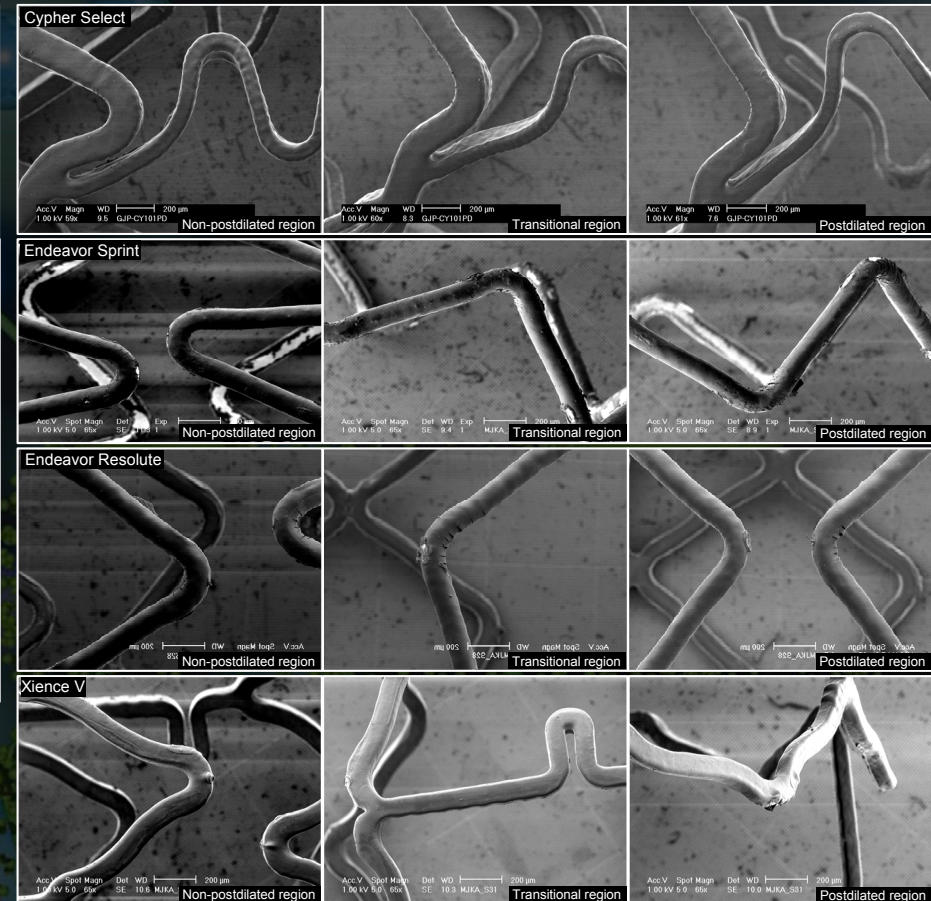
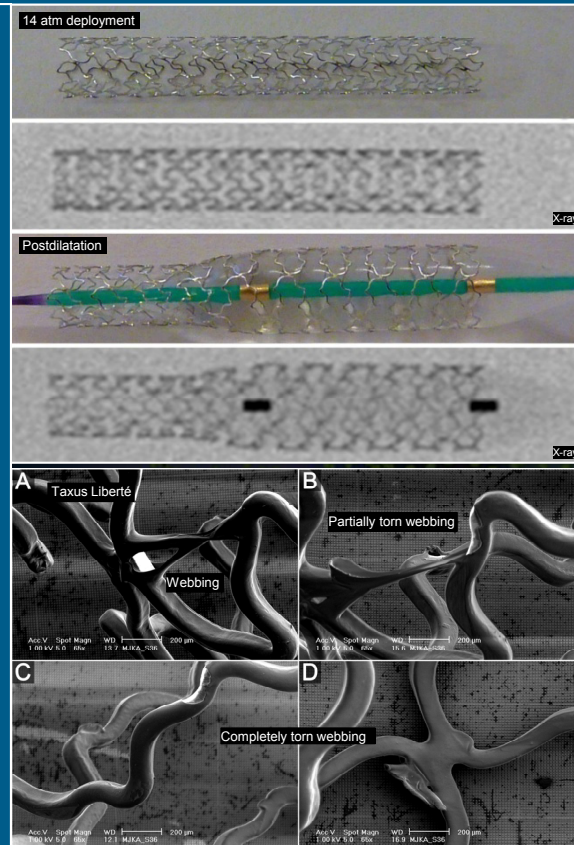
Response of Five Types of Contemporary Drug-Eluting Stents to Aggressive Partial Postdilatation as Assessed by Scanning Electron Microscopy

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Purpose. To assess the shape and incidence of coating irregularities on durable polymer-based drug-eluting stents (DES) following extremely oversized aggressive partial post-dilatation. In clinical practice, DES post-dilatation is often performed to avoid malapposition (e.g. in lesions with significant vessel tapering or rigid, calcified lesions). Sometimes even extremely oversized partial post-dilatation of DES may be required, which exposes the stent to extreme forces. The influence of such maneuvers on DES coatings, however, is greatly unknown.

Methods. Micro-computed tomographic data of our group recently demonstrated that oversized partial post-dilatation leads to a particularly high stent deformation between the non-post-dilated and post-dilated stent regions. Accordingly, we performed such a maneuver in 15 DES (three 3.5mm-samples of Cypher Select Plus, Taxus Liberté, Endeavor Sprint, Endeavor Resolute, and Xience V) after deployment in water at 14 atm. All DES were proximally post-dilated with an oversized non-compliant balloon (5.0mm at 18atm; see panel on right hand side) and examined with scanning electron microscopy.

Results. Shape and incidence of coating irregularities in the post-dilated and transitional region of DES differed mildly from the non-oversized stent region. In Taxus Liberté one additional irregularity (torn webbing) and more wrinkles were observed ($p < 0.05$, both), while in Endeavor Resolute more and larger cracks were observed ($p < 0.001$).



Conclusions. Only a single additional coating irregularity – torn webbing – was observed in one DES type following extremely oversized partial post-dilatation. This bench side study in five types of durable polymer-based DES suggests that aggressive post-dilatation generally shows only mild effects on (bio-)durable polymer coatings.

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