Abstract: 6109

A novel parameter for stent expansion is superior to conventional parameters for predicting adverse events after drug-eluting stent implantation

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Topic(s):
Optical Coherence Tomography

Citation:

Background: Among several parameters for stent expansion, which is better for predicting adverse events remains to be elucidated.

Purpose: To assess the predictive significance of several parameters for stent expansion on the incidence of adverse cardiac events.

Methods: A total of 183 consecutive patients with de novo lesion treated with drug-eluting stent (DES) under optical coherence tomography (OCT) guidance were enrolled. The stent expansion was retrospectively assessed on the final OCT images after the stent implantation by both conventional and novel parameters. The conventional parameters included the minimum stent cross-sectional area (MSA) and %stent expansion defined as [MSA / mean reference lumen cross-sectional area × 100]. The novel parameter was the minimum expansion index (MEI) calculated by using a novel algorithm which yields the ideal lumen area in each frame by taking into account vessel tapering. The expansion index was calculated by [actual lumen area / ideal lumen area × 100] in each frame through the stented segment. The MEI was the minimum value of expansion index through the stented segment. The both conventional and novel parameters were compared between cases with and without device-oriented cardiac events (DoCE). Receiver operating characteristics (ROC) curves were constructed to assess the ability of those parameters to predict DoCE.

Results: The MSA and MEI in the DoCE group (n=12) were significantly smaller than the no DoCE group (n=171) (3.29 ± 0.72 vs. 4.45 ± 1.97 mm², p <0.001, 66.9 ± 10.6 vs. 78.3± 14.8 %, p=0.01, respectively), although the %stent expansion was not significantly different between the two groups (62.7± 11.9 vs. 70.7 ± 16.3 %, p=0.094). In ROC analyses, the area under curve of MEI to predict DoCE was the largest among the parameters (Figure).

Conclusion: Among several parameters for stent expansion, a novel MEI was better to predict device-oriented cardiac events after DES implantation.
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Figure. ROC analysis to predict DoCE

<table>
<thead>
<tr>
<th>Variables</th>
<th>Best cut-off</th>
<th>AUC</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEI, %</td>
<td>73.0</td>
<td>0.765</td>
<td>0.917</td>
<td>0.671</td>
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<td>MSA, mm²</td>
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<td>1.000</td>
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<td>%stent expansion</td>
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<td>0.684</td>
<td>0.917</td>
<td>0.526</td>
<td>0.094</td>
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