Does the second generation OCT improve safety and feasibility in clinical practice?
A single center experience
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Background
Fourier-domain optical coherence tomography (FD-OCT) has been recently developed to overcome the limitations of conventional time-domain (TD-OCT), particularly with respect to the need for proximal balloon occlusion.
The use of a monorail FD-OCT imaging catheter over a conventional guide wire, together with the ability for rapid data acquisition (approximately 100 frames/sec) and a fast motorized pullback (up to 40mm/sec), might offer advantages in clinical practice.

Methods
We prospectively evaluated the safety and feasibility of intracoronary FD-OCT. Consecutive patients who had FD-OCT examination during cardiac catheterization were included (Group C). These data were compared to a historic cohort (Group A: TD-OCT with proximal balloon occlusion, Group B: TD-OCT with non-occlusive flush technique).

<table>
<thead>
<tr>
<th>Group</th>
<th>OCT system</th>
<th>Technique</th>
<th>Flush solution</th>
<th>Flush rate (ml/s)</th>
<th>Pullback speed (mm/sec)</th>
<th>Period</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>TD-OCT LLI M2 LLI M3</td>
<td>Proximal balloon occlusion</td>
<td>Ringer’s lactate</td>
<td>0.5-1.2</td>
<td>1.0 mm/sec</td>
<td>September, 2004 - August, 2008</td>
<td>No</td>
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<tr>
<td>Group B</td>
<td>TD-OCT LLI M3</td>
<td>Flush through guiding catheter</td>
<td>Viscous iso-osmolar X-ray contrast (Iodixanol 320)</td>
<td>1.0-3.0</td>
<td>3.0 mm/sec</td>
<td>September, 2004 - August, 2008</td>
<td>No</td>
</tr>
<tr>
<td>Group C</td>
<td>FD-OCT LLI M4 MGH, Terumo</td>
<td>Flush through guiding catheter</td>
<td>Viscous iso-osmolar X-ray contrast (Iodixanol 320)</td>
<td>3.0-4.0</td>
<td>10-20 mm/sec</td>
<td>April, 2008 - August, 2009</td>
<td>No</td>
</tr>
</tbody>
</table>

Parameters: length of vessel imaged, image acquisition time, total volume of X-ray contrast needed to clear blood, image quality score (IQS)
IQS (%) = good quality frames / total number of frames X 100
Good quality frames (GQF) : frames with a delineation of the lumen border for more than 270 degrees of the vessel circumference

Risk assessment: transient myocardial ischemia (chest pain, ST segment changes, arrhythmia) and major adverse cardiovascular events (MACE).

Conclusions
FD-technology increases the safety and feasibility of intracoronary OCT, allowing a simple, fast pullback to be performed over long segments of coronary artery without any clinical consequences.

All authors have no conflict of interest to declare.