Intravascular Ultrasound (IVUS) Analysis of Intensive Plaque Modification with Rotational Atherectomy (RA) with or without Adjunctive Cutting Balloon for Extremely Calcified Coronary Lesions

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Introduction: Intensive plaque modification with rotational atherectomy (RA) ± cutting balloon (CB) can facilitate successful stent delivery in extremely calcified coronary lesions. However, there is a paucity of studies examining the effects of this on stent expansion.

Methods: We retrospectively analysed consecutive patients undergoing IVUS-guided RA at Liverpool Hospital between Jan 2016-Dec 2018. IVUS was performed post-RA and after stenting. Calcium-index was defined as maximum superficial calcium arc multiplied by calcium length/lesion length. Post-RA reverberations (multiple reflections from calcium) were considered to represent RA-related plaque modification and reverberation-index was maximum reverberation angle multiplied by reverberation length. Stent expansion was minimum stent area (MSA)/average reference lumen area.

Results: Among 76 total RA cases, 15 were IVUS-guided with 20 lesions included for analysis. Mean age 80.3 ± 8.9 years, 93% male. Adjunctive CB was used in 15 lesions (75%). A mean of 1.1 burr/patient was used with the most common burr size being 1.5 mm (9 lesions). Mean burr/artery ratio was 0.45 and burr/IVUS-lumen (external-elastic-lamina diameter) ratio was 0.41. Median calcium-index was 96.6 (IQR 52.5-133.7), with 3600-arc calcium in 11 lesions (55%). Calcium splitting was seen in 13 lesions (65%). Median MSA was 7.5 mm² (IQR 6.5-10.7mm²). Median stent expansion was 91.5% (IQR 75.3%-95.6%, range 58.2%-98.3%). Median reverberation-index was 445.5 (IQR 256.9-825.6). Calcium-index negatively correlated with stent expansion (r = -0.62, 95%CI: -0.80 to -0.40, p = 0.01), and positively correlated with reverberation-index (r = 0.53, 95%CI: 0.11-0.79, p = 0.02). Angiographic success achieved in all cases.

Conclusions: Increased coronary calcification is correlated with stent under-expansion despite greater plaque modification. IVUS-guidance ensured satisfactory MSA was achieved post-stenting.

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Invasive Assessment of Low Flow Low Gradient Aortic Stenosis

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Background: Low flow low gradient Aortic stenosis (LF-LG AS) is seen in about 5-10% of patients with severe AS and is characterised by a discordance between the aortic valve area (AVA) <1 cm² and/or index (i) AVA <0.6 cm²/m² (consistent with severe AS) and the mean gradient (MG)<40 mmHg, (consistent with non-severe AS). Non-invasive assessment of LF-LG AS can be challenging.

Aim: We hypothesised that invasive assessment of LF-LG AS in the cardiac catheterisation laboratory with dobutamine stress testing can accurately assess AS severity and guide management.

Methods: We conducted a single centre, single operator dependent retrospective study on 18 patients identified to have LF-LG AS by echocardiography. Invasive assessment involved measurement of simultaneous gradients across the aortic valve with measurement of cardiac output (CO) using thermodilution. Clinical outcome following surgical or transcatheter aortic valve replacement (SAVR or TAVR) or medical management for patients with true and pseudo AS was studied.

Results: 11 patients had true severe AS, 5 patients had pseudo AS and 2 had inconclusive finding (See table).

<table>
<thead>
<tr>
<th></th>
<th>True AS</th>
<th>Pseudo AS</th>
<th>Inconclusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline MG</td>
<td>26.91 ± 4.11</td>
<td>24.08 ± 4.77</td>
<td>15.75 ± 1.77</td>
</tr>
<tr>
<td>Post MG</td>
<td>39.4 ± 5.41</td>
<td>39.08 ± 10.19</td>
<td>22.6 ± 0.71</td>
</tr>
<tr>
<td>Baseline iAVA</td>
<td>0.39 ± 0.09</td>
<td>0.52 ± 0.05</td>
<td>0.51 ± 0.10</td>
</tr>
<tr>
<td>Post iAVA</td>
<td>0.43 ± 0.1</td>
<td>0.68 ± 0.11</td>
<td>0.33 ± 0.06</td>
</tr>
<tr>
<td>Baseline CO</td>
<td>3.66 ± 1.13</td>
<td>4.2 ± 0.78</td>
<td>3.48 ± 0.22</td>
</tr>
<tr>
<td>Post CO</td>
<td>3.07 ± 1.34</td>
<td>5.94 ± 0.95</td>
<td>4.75 ± 1.91</td>
</tr>
<tr>
<td>Max Dobutamine dose(mcg/kg/min)</td>
<td>22.27 ± 15.3</td>
<td>26.1 ± 13.42</td>
<td>50.1 ± 14.4</td>
</tr>
</tbody>
</table>

6 out of 11 true severe AS patients underwent SAVR or TAVR and all survived beyond 3 years. Of the 5 patients treated conservatively, mortality was 40% in 1 year and 100% in 3 years. 1 patient with pseudo AS underwent SAVR while 4 were medically managed. All patients with pseudo AS survived beyond 1 year.

Conclusions: The hybrid heart team co-proceduralist approach as adopted has resulted in low complication rates with good patient outcomes. This likely results from appropriate patient selection and superior peri-procedural care, in particular the ability to assess and pre-empt the potential for major vascular complications with a surgeon and cardiologist working together is key. The results described are consistent with other national and international experience employing a similar model.

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Abstracts

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were the “low-risk” for sAVR suggesting deficiency of using situation and BMI.

outcomes such as: previous cardiac surgery; porcelain aorta, frailty score, mental state (dementia), mobility, social

Medicare risk” (STS 4-7%) and 139 “high risk” (STS ≥8%). TAVI was performed as recommended by an MDT, indicating there are other factors which must be considered during risk assessment of patients such as: previous cardiac surgery, porcelain aorta, frailty score, mental state (dementia), mobility, social situation and BMI.

Conclusion: The majority of patients in the TAVI Registry were the “low-risk” for sAVR suggesting deficiency of using situation and BMI.

Conclusion: Invasive assessment of LF-LG AS is an alternative to accurately assess the true severity of AS and guide appropriate management to improve long term outcomes.

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Is STS Score Enough to Predict Appropriate High-risk Surgical Patient for TAVI

STS risk levels are included in the cohort of data exported from the TAVI Registry in February 2019.

Three important for decision of TAVI vs sAVR. The TAVI Registry (sAVR). However, it does not include many factors deemed against outcomes for surgical Atrial Valve Replacement (sAVR).

Conclusion: Invasive assessment of LF-LG AS is an alternative to accurately assess the true severity of AS and guide appropriate management to improve long term outcomes.

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Is there a Mortality Hazard for Women after Percutaneous Coronary Intervention for Acute Coronary Syndrome? Analysis of the GenesisCare Outcomes Registry

Women undergoing PCI for ACS, demonstrate differing baseline characteristics and higher rates of mortality as well as readmissions at 1 year than men. This indicates a need for improved treatments for women undergoing PCI.

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Introduction: Sex differences are increasingly recognised in clinical presentation, treatment and outcomes in acute coronary syndromes (ACS). Women are reported to have higher mortality related to percutaneous coronary intervention (PCI) than men. However, the effect of sex on long-term outcomes after PCI in Australia is unknown.

Methods: Patients with ACS undergoing PCI were stratified by sex. We evaluated 1-year mortality and rates of readmissions.

Results: Data were available for 5004 patients (24.2% women) having PCI for ACS from Nov 2008 - Jan 2018. Women were older (71.7 ± 11.0 vs 66.8 ± 11.2 years p < 0.001), with more hypertension (79.1% vs 69.4%, p < 0.001), vessel < 2.5mm (30.8% vs 21.3%, p < 0.001), AF (16.4% vs 12.8%, p 0.018) or shock (1.4% vs 0.7%, p < 0.019) but lower rates of smoking (39.6% vs 61.4%, p < 0.001), multivessel disease (39.5% vs 46.8%, p < 0.001) or radial PCI. At 1-year women had a trend for higher rates of death and significantly greater rates of readmissions than men (aOR 1.37, 1.11-1.66, p = 0.003).

Conclusion: Women undergoing PCI for ACS, demonstrate differing baseline characteristics and higher rates of mortality as well as readmissions at 1 year than men. This indicates a need for improved treatments for women undergoing PCI.

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