Long-Term Outcomes of Percutaneous Coronary Intervention for Chronic Total Occlusion (CTO) - A Useful Predictor of Successful Revascularization in CTO-PCIs?
Comparison with the J-CTO Score.

Masaki Tanabe, Kohei Asada, Takafumi Yagi
1 Daini Okamoto General Hospital, Kyoto, Japan, 2 Daini Okamoto General Hospital, Kyoto, Japan

Background: CTO intervention is still challenging because of the limited procedural success rate. The SYNTAX score is a unique tool to score complexity of coronary artery disease involving CTO lesion, but it isn’t specific for CTOs.

Methods: We evaluated whether the SYNTAX score focused on the evaluation of CTO lesions (the Sys-CTO score) could predict successful revascularization for CTO-PCI or not, compared with the J-CTO score. We investigated the Sys-CTO score and the J-CTO score in consecutive 257 lesions treated with coronary angioplasty for CTOs. The Sys-CTO score was assigned on each CTO lesion by extracting from the SYNTAX Calculator 2.11. The J-CTO score was determined by assigning one point for each independent parameter using the J-CTO score sheet.

Results: Overall successful revascularization rate was 85.2% (219/257), and the average the Sys-CTO score and the J-CTO score were 12.3±6.2, 1.75±1.3, respectively. We divided all CTO lesions into two groups; the successful revascularized group (n=219; SG) and the failed revascularized group (n=38; FG). Relationship between the value of the J-CTO score and successful revascularization rate (%) were shown as follows: (0):100, (1):93.4, (2):82.5, (3):67.4, (4):73.9, (5):66.7, respectively. As for the J-CTO score, there were statistically different between the two groups: SG:1.6±1.2, FG:2.7±1.1 (P<0.001). Whereas, as to the Sys-CTO score, there were balanced between the two groups: SG:12.3±6.3, FG:12.3±5.2. In the detailed evaluation of the Sys-CTO score, these six parameters seemed to be predictive factors inhibiting successful revascularization (P<0.05). Beyond the segment visualized contrast ≥ segment (FG:34.2%±SG:25.1%), Blunt stump (FG: 63.1%±SG:45.2%), Bridging (FG:34.2%±SG:12.3%), Severely tortuous (FG:26.3%±SG:15.0%), Heavy calcification (FG:42.1%±SG:23%), Diffuse diseased and narrowed segment (FG:36.8%±SG:31.5%).

Conclusions: The J-CTO score was recognized as the predictor of a successful revascularization for CTO-PCIs. On the other hand, the Sys-CTO score could not be predictive factor by itself. However, these distinctive six parameters could be a useful predictor of a successful revascularization for CTO-PCI as well as the J-CTO score.

TCT-367

Can the SYNTAX Score Focused on the Evaluation of Chronic Total Occlusion (CTO) Be a Useful Predictor of Successful Revascularization in CTO-PCIs? Comparison with the J-CTO Score.

Tesfaldet T. Michael, Owen Mogabgab, Mohammed E. Alomar, Kotzia Anna, Eric Fuh, Vishal G. Patel, Bavana Rangan, Shuaib Abdullah, Jerrold Grodin
1 University of Texas Southwestern Medical Center & Dallas VA Medical Center, Dallas, TX, 2 University of Ioannina, Ioannina, Greece, 3 University of Texas Southwestern and North Texas VA Healthcare System, Dallas, TX, 4 North Texas Cardiovascular Health Care System and UT Southwestern Medical School, Dallas, TX, 5 UT Southwestern Medical Center/Dallas VA Medical Center, Dallas, TX, 6 VA North Texas Cardiovascular Health Care System and University of Texas Southwestern Medical Center, Dallas, Texas, Dallas, TX, 7 Careggi Hospital, Florence, Italy

Background: Coronary chronic total occlusion (CTO) is frequently associated with multivessel disease. Large registries have shown a higher mortality in patients with unsuccessful CTO-PCI for left anterior descending artery (LAD) as compared to non-LAD-CTO. Furthermore, patients with incomplete coronary revascularization due to non attempted or failed CTO-PCI had a poor prognosis as compared to patients with a complete revascularization. No data exist about the prognostic impact of drug eluting stent (DES) supported successful PCI for LAD-CTO in patients with a complete retrograde revascularization achieved by PCI.

Methods: From the prospective Florence CTO PCI registry, since 2004 to 2010, 644 patients underwent successful PCI for CTO (>3 months) with a complete coronary revascularization within one month. The prognostic impact of LAD-CTO on cardiac mortality was assessed by Kaplan-Meier estimation and by forward stepwise Cox regression multivariate analysis.

Results: A successful CTO-PCI with a complete coronary revascularization was achieved in 194 patients with LAD-CTO and in 450 patients with non-LAD-CTO. Baseline characteristics of patients with LAD-CTO vs. non-LAD-CTO were similar: mean age 68±11 vs. 67±11 years, male 83% vs. 86% diabetes 22% vs. 23%, previous myocardial infarction 51% vs. 48%, acute coronary syndrome at admission 34% vs. 29%. 3-vessel coronary disease was 43% vs. 48%, left ventricular ejection fraction (EF) 44%±13 vs. 45%±12, stent length ≥40 mm in LAD-CTO 51% vs. 57% in non-LAD-CTO. A multivessel PCI was performed in 70% of both groups. The clinical follow-up rate was 100% (median 1 year). The cardiac survival rate was higher in the non-LAD-CTO group as compared to LAD-CTO group (96±2% vs 89±3%; P=0.004). At multivariate analysis the independent predictors related to cardiac mortality were LAD-CTO (HR 2.9; p=0.025), age (HR 1.1; p=0.002) and EF <40% (HR 14; p<0.001).

Conclusions: The successful treatment of non-LAD-CTO associated with a complete revascularization links with a very high survival rate. LAD-CTO is a predictor of cardiac mortality despite the completeness of coronary revascularization.

TCT-366

Short and Long-Term Outcomes After Retrograde Coronary Intervention for Chronic Total Occlusion: Comparison With the Anterograde Approach

Yasuake Watanabe, Yves Louvard, Francesca Sangiusti, Stephen O’Connor, Thomas Hovasse, Philippe Garot, Marie-Claude Morice, Thierry Lefevre
1 Institut Cardiovasculaire Paris Sud, Générale de Santé, Massy, France, 2 Institut Cardiovasculaire Paris Sud, Générale de Santé, Quincy, France

Background: Little data is available about safety, feasibility, and long-term outcome after retrograde CTO PCI. This study sought to examine the short and long-term outcomes of retrograde chronic total occlusion (CTO) percutaneous coronary intervention (PCI). Information about retrograde PCI is rare.

Methods: A single-center prospective registry. 1343 consecutive patients underwent CTO PCI from January 2004 to January 2012.

Results: Of these, 144 (10.7%) had retrograde CTO PCI. 1, 3, 10.2, 6.2, 15.6, 10.9, 16.1, 23.4% from 2004 to 2011). Patients with retrograde CTO were significantly younger (61±2 vs. 63.9±11.4 years, p<0.001), more frequently dyslipidemic (72.9% vs. 62.3%, p<0.01), right coronary artery (CTO: 65.3 vs. 43.7%, p<0.01), longer lesion length (27.2±21.9 vs. 19.6±16.5 mm, p<0.01) and less tapered morphology (31.7 vs. 46.5%, p<0.01). Procedural success rate of antegrade and retrograde approach was 73.7 and higher complexity of CTO lesions and long stent lengths needed in those treated with the retrograde approach.
POSTERS

TUESDAY, OCTOBER 29, 2013, 3:30 PM–5:30 PM
www.jacctcabstracts2013.com

70.8% (p=0.46). Coronary perforations (10.5 vs 3.0%; p<0.01) and need for pericardial drainage (3.6 vs 1.0%; p<0.02) were more frequent among retrograde compared to antegrade approach. However, need for emergency cardiac surgery were similar (0 vs 0.9%, p=0.57). Retrograde CTO PCI was related with longer procedure time (149.7±58.6 vs 80.7±40.2 min; p<0.01), fluoroscopy time (75.8±39.1 vs 42.5±29.8 min; p<0.01) and higher contrast dose (385.1±180 vs 257.5±185 mL; p<0.01). The incidence of in-hospital major cardiac death, myocardial infarction (MI) and death were similar (0.7 vs 1.1%, p=0.11, 4.8% vs 4.7%, p=0.83) were similar between retrograde and antegrade approach. Among patients with successful CTO PCI, the 3-year cumulative target lesion revascularization (TLR) rate was significantly higher in retrograde approach compared with antegrade (12.6% vs 6.9%; p=0.045).

Conclusions: Higher incidences of coronary perforation and pericardial drainage, but no emergency cardiac surgery were observed after retrograde CTO PCI. Although longer procedure time was higher, retrograde CTO PCI was associated with acceptable procedural success rate and similar short and long-term adverse events compared with antegrade CTO PCI.

TCT-367
Long Term Clinical Outcome After PCI for Chronic Total Occlusion CTO: Does Procedural Success Matter?
Francesca Sangiuento1, Thierry Lefevre1, Stephen O'Connor1, Yauke Watanabe1, Philippe Garot1, Talal Harb1, Yves Louvard1
1Institut Cardiovasculaire Paris Sud, Générale de Santé, Massy, France, 2Institut Cardiovasculaire Paris Sud, Générale de Santé, Quincy, France

Background: Whether successful PCI of a coronary CTO is associated with improved survival is the subject of debate. Using a large prospective database of patients treated for CTO, we sought to compare long-term outcome of patients on the basis of success failure of index PCI procedure.

Methods: Between 2004 and 2012, a total of 1,343 consecutive patients underwent PCI for CTO in our centre (14 operators). We compared major adverse cardiac events (MACE) including cardiac death, target vessel revascularisation (TVR), and myocardial infarction (MI) in patients with successful versus failed PCI at a median follow-up of 4.1 years (IQR: 2.4-6.5 years). Procedural success was defined as achievement of residual stenosis <50% with TIMI 3 flow in the target vessel.

Results: Successful treatment of CTO by PCI was achieved in 1000 (74%) patients. These patients were younger (63±11 vs 65±11 respectively p=0.02), had lower rates of hypertension (56.1% vs 66.8% p<0.01), previous MI (19.5 % vs. 29.2% p<0.01) and were more frequently treated for left anterior descending artery CTO (33.2 vs. 23.0%, p=0.01) than those in whom PCI success was not achieved. However, left ventricular ejection fraction and diabetes mellitus were similar between groups, PCI success was associated with significantly lower MACE among patients with successful PCI (16.7 vs 22.2%, p=0.0235) driven mainly by lower rate of cardiac death at follow up (4.2 vs 11%, p=0.0001). Independent predictors of lower cardiac death by multivariate analysis were: successful PCI (HR: 0.42, 95% CI: 0.27-0.67, p<0.01), absence of previous MI (HR: 1.68, 95% CI: 1.03-2.74, p=0.04) and younger age (HR: 1.05, 95% CI: 1.03-1.08, p<0.01).

Conclusions: In this large cohort of patients treated by PCI for CTO, successful revascularization was associated with improved clinical outcome at long-term follow-up. This was driven by lower cardiac mortality rates among these patients.

TCT-368
Long Term Clinical Outcome in Elderly Patients (>75 years) Versus Younger Patients (<75 years) Undergoing PCI for Chronic Total Occlusion
Stephen O'Connor1, Thierry Lefevre1, Francesca Sangiuento1, Yauke Watanabe1, Thomas Hovasse1, Thierry Unterkeller1, Marie-Claude Morice1, Hakim Benamer1, Philippe Garot1, Yves Louvard1
1Institut Cardiovasculaire Paris Sud, Générale de Santé, Massy, France, 2Institut Cardiovasculaire Paris Sud, Générale de Santé, Quincy, France

Background: To assess the procedural success rate and the long-term clinical impact of percutaneous coronary intervention (PCI) for chronic total occlusions (CTO) in elderly patients.

Methods: A total of 1,343 consecutive patients with underwent PCI for 1,432 CTO lesions between Jan 2004 and Jan 2012 at our center. Outcomes including procedural success and major adverse cardiac events (MACE) and its components, cardiac death, myocardial infarction, and target vessel revascularization between patients aged ≥75 and those aged <75 years were compared.

Results: A total of 253 patients (19%) were aged ≥75 years. Compared to patients <75 years, elderly patient were more commonly female (20% vs. 11.8%, p=0.0001) and presented more commonly with left anterior descending coronary artery CTO (41.5% vs. 28.5%, p=0.01). Procedural success rates were similar in both groups (74.9% vs 72.7%, p=0.48). Mean follow-up was 4.1 years (IQR: 2.4-6.5 years). MACE rates after successful versus failed PCI were 20.9% versus 29.8% in the elderly (p=0.15) and 21.0 versus 24.1% in younger patients (p=0.12). In elderly patients, there was a smaller reduction in MACE after successful PCI was driven by a significant reduction in cardiac mortality (Figure). There was also a significant reduction in all-cause mortality (21.1% vs. 35.9%, p=0.02) and no significant differences in the rate of MI (2.8% vs. 1.6%, p=0.597).

Conclusions: PCI for CTO has similar success rate in the elderly (≥75 years) and is associated with a significant reduction in cardiac mortality when success is achieved.

TCT-370
Impact of Chronic Total Occlusions on Mortality in Patients Presenting With Acute Coronary Syndromes
Lucas Labine1, David A. Hildebrandt1, Stephanie Rutten-Ramos1, Meghan Lardy1, Michael Claussen1, Ross Garberich1, M Nicholas Burke1
1Minneapolis Heart Institute Foundation at Abbott Northwestern Hospital, Minneapolis, MN

Background: Chronic Total Occlusions (CTOs) are commonly encountered in patients (PTs) with Acute Coronary Syndromes (ACS). It has been reported that the presence of a CTO is associated with increased mortality in PTs presenting with ST elevation and non-ST elevation Myocardial Infarctions (STEMI). It is less clear if this same association is true for PTs presenting with non-STEMI ACS (NSTEACS).

Methods: The Minneapolis Heart Institute has developed standard treatment protocols for STEMI (Level 1, L1) and NSTEACS (Level 2, L2) PTs. From 2007-2011, 827 sequential STEMI PTs and from 2009-2012, 827 sequential NSTEACS PTs who underwent angiography were evaluated for the presence of at least one CTO in a major coronary vessel. In-hospital, 30 day, and 1 year mortality were compared between PTs who did and did not have a CTO.

Results: See table below:

<table>
<thead>
<tr>
<th>Time</th>
<th>STEMI</th>
<th>NSTEACS</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-hospital</td>
<td>1.2%</td>
<td>1.5%</td>
</tr>
<tr>
<td>30 day</td>
<td>2.1%</td>
<td>2.5%</td>
</tr>
<tr>
<td>1 year</td>
<td>6.5%</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

Conclusions: The presence of a CTO is associated with higher mortality in PTs presenting with STEMI, but not NSTEACS.