Transradial Access For Subclavian, Innominate and Carotid Disease

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Disclosure Statement

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below:

<table>
<thead>
<tr>
<th>Affiliation/Financial Relationship</th>
<th>Company</th>
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<tbody>
<tr>
<td>➢ Consulting Fees/Honoraria</td>
<td>➢ Boston Scientific</td>
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<td></td>
<td>➢ Medtronic</td>
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<tr>
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<td>➢ Terumo</td>
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</tbody>
</table>
Femoral Environment
Risk of Catheter-Related Emboli in Patients With Atherosclerotic debris in the Thoracic Aorta


Courtesy of Dr. A. Pacchioni
The most common adverse event after CAS from the femoral approach

MOST TECHNICAL FAILURES ARE RELATED TO A COMPLEX ARCH
Carotid Artery Stenting
Case 1.

TRA CAS of LICA in Patient With Acute Carotid Syndrome

Male
K. A.
58 y.o.
Thrombotic Subocclusion of LICA
Shuttle Sheath 5F
Final Result (Adapt 4-9/40mm)
Final Result
Case 2.

TRA CAS of LICA in Highly Symptomatic Patient With Amaurosis Fugax

Male
K. G.
64 y.o
After Additional Vasodilators
LICA 99%+Thrombus
“Wireless” Telescopic Approach
Shuttle Sheath 5F
Final Result
Case 3.

TRA CAS of LICA With MoMa Proximal Protection

Male
S. P.
59 y.o.
Right RA
LICA 95%
8F - MoMa PPD
MoMa PPD
Final Result
Case 4.

TRA for CAS of RICA and Stenting of Occluded Right Subclavian Artery

Male
E. A.
66 y.o.
Occlusion of Right Subclavian Artery
Balloon Predilatation 4.0/20
Result
TRA CAS of RICA
AVE Bridge 7.0/16 mm
Final Result
5 Years Follow up
Subclavian and Innominate Artery Stenting
Results of Transradial Subclavian Artery Percutaneous Interventions After Bilateral or Single Access

Sasko Kedev, MD, PhD\(^a\,*\), Biljana Zafirovska, MD\(^a\), Danica Petkoska, MD\(^a\), Ivan Vasilev, MD\(^a\), and Olivier F. Bertrand, MD, PhD\(^b\)

Percutaneous treatment of subclavian artery stenosis or occlusion has become more popular compared with surgical correction. We compared the early and late results of subclavian artery stenting with bilateral or single transradial access. From 2010 to 2015, we recruited 54 consecutive patients. In 35 cases, we used bilateral access, and in 19 cases, ipsilateral single access was used. Left subclavian artery was the culprit vessel in 72% of cases. There were more chronic total occlusions in the bilateral group (77% vs 21%, \(p = 0.0001\)). Transradial-only approach was used in all cases, except in 2 cases in the bilateral group where crossover to femoral access was required. Stents were implanted in 94% in bilateral group and 84% in single group (\(p = 0.47\)). Procedure duration (40 [35 to 60] vs 20 [15 to 30] minutes), contrast volume (200 [200 to 350] vs 150 [100 to 200] ml and fluoroscopy time (20 [12 to 30] vs 8 [4 to 11] minutes) were higher in bilateral group (all \(p\) values <0.0001). Procedural success was 96%. Overall, we observed three <5-cm hematomas and 3 asymptomatic radial artery occlusions at hospital discharge. After successful procedure, blood pressure equalized in 94% in bilateral group and 100% in single group (\(p = 0.54\)). Major cardiovascular and cerebrovascular event-free survival up to 5 years was 97% in bilateral group compared with 84% in single group (\(p = 0.12\)). Subclavian artery patency at late follow-up was 91% in bilateral group and 95% in single group (\(p = 1.00\)). Using single or bilateral transradial approach, subclavian artery lesions or occlusions can be effectively and safely treated without the risks of femoral or brachial access. © 2016 Elsevier Inc. All rights reserved. (Am J Cardiol 2016;118(6):918-23.)
## Procedure Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>All (n=54)</th>
<th>Bilateral (n=35)</th>
<th>Ipsilateral (n=19)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic total occlusion</td>
<td>31 (57%)</td>
<td>27 (77%)</td>
<td>4 (21%)</td>
<td>0.0001</td>
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<tr>
<td>Left subclavian</td>
<td>39 (72%)</td>
<td>25 (71%)</td>
<td>14 (74%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Right subclavian</td>
<td>15 (28%)</td>
<td>10 (29%)</td>
<td>5 (26%)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

# Procedure Characteristics

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<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure success</td>
<td>52 (96%)</td>
<td>34 (97%)</td>
<td>18 (95%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Transradial access success</td>
<td>52 (96%)</td>
<td>33 (94%)</td>
<td>19 (100%)</td>
<td>0.54</td>
</tr>
<tr>
<td>Fluoroscopy time, min</td>
<td>14 [8-24]</td>
<td>20 [12-30]</td>
<td>8 [4-11]</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Total amount of contrast, ml</td>
<td>200 [150-300]</td>
<td>200 [200-350]</td>
<td>150 [100-200]</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Simultaneous PCI</td>
<td>5 (9.3%)</td>
<td>2 (5.7%)</td>
<td>3 (16%)</td>
<td>0.33</td>
</tr>
<tr>
<td>Simultaneous CAS</td>
<td>6 (11%)</td>
<td>2 (5.7%)</td>
<td>4 (21%)</td>
<td>0.17</td>
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</table>

## Clinical Outcomes: Long-term Follow-up

<table>
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<tr>
<th>Variable</th>
<th>All (n=54)</th>
<th>Bilateral (n=35)</th>
<th>Ipsilateral (n=19)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up (days)</td>
<td>610 [345-985]</td>
<td>610 [445-975]</td>
<td>550 [198-1709]</td>
<td>0.59</td>
</tr>
<tr>
<td>MACCE (%)</td>
<td>4 (7)</td>
<td>1 (3)</td>
<td>3 (16)</td>
<td>0.12</td>
</tr>
<tr>
<td>Death (%)</td>
<td>1 (2)</td>
<td>0</td>
<td>1 (5)</td>
<td>0.35</td>
</tr>
<tr>
<td>Myocardial infarction (%)</td>
<td>1 (2)</td>
<td>0</td>
<td>1 (5)</td>
<td>0.35</td>
</tr>
<tr>
<td>Stroke (%)</td>
<td>2 (4)</td>
<td>0</td>
<td>2 (11)</td>
<td>0.12</td>
</tr>
<tr>
<td>TVI (%)</td>
<td>1 (2)</td>
<td>1 (3)</td>
<td>0</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Kaplan Meier Curve For Event Free Survival

Innominate Artery Stenting

Case 5.
Innominate Artery Occlusion
Stent Deployment
Final Result
RICA – Normal Flow
Case 6.

Innominate Artery Stenting
Case 7.

Bilateral RA for Left Subclavian Artery Stenting

N.M.
Male
64 y.o
Left Subclavian Artery CTO
Left Subclavian Artery CTO
Confianza pro & Corsair
Balloon Predilatation 3.0/20mm
Stent Positioning
Stent: Dynamic 8,0/25mm
Final Result
Bilateral TRA for Left Subclavian Artery Stenting

Male, M. S.
63 y.o
Balloon Predilatation 2,0/20mm
Stent Deployment
Stent Positioning
Omnilink Elite 8.0/29mm
Final Result
Before / After
Case 9.

RA for Symptomatic
Vertebral Artery Stenting

A.L
Female
52 y.o.
Right Vertebral Artery Stenosis
NAV 6 - Synergy 4.0/20
Final Result
Final Result
Trans Radial Interventions

ADVANTAGE

- Easy access in complex aortic arcs
- Retrograde approach in subclavian CTO’s
- Less aortic manipulation
- Eliminates bleeding complications
- Immediate patient mobilisation
- Reduced nursing cost
- Outpatient performance
Conclusion

- Subclavian artery lesions can be effectively and safely treated with single or bilateral RA
- Technique of “guideless retrograde stent delivery” only through short 6F introducer under contralateral angio control, eliminated the necessity of large bore guiding catheter or sheath
- Further studies are needed before recommending wrist access for endovascular procedures as primary approach over FA