Procedural Trends Associated With Successful Initiation Of A Transradial Program At An Academic Training Institution

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Background

There are limited data on the safety and feasibility of initiating a transradial cardiac catheterization (TRCC) program at an academic institution where trainees are the primary operators.

While TRCC reduces procedural complications and patient discomfort relative to transfemoral cardiac catheterization (TFCC), it may also be associated with longer procedural and fluoroscopy times, especially for novice operators.

In this study, we describe procedural variables and clinical outcomes of TRCC in a teaching program.

Methods

Beginning in April, 2018, trainees at UC Davis Medical Center participated in TRCC, with cardiology fellows being the primary operators.

Procedural variables and clinical outcomes of TFCC were compared with TRCC.

To reflect the learning curve of TRCC, we also compared the first six months (n=163) of the TRCC cohort with the second six months (n=176).

Results

1,777 cardiac catheterizations were performed from April 2010 to March 2011.

1,438 (81%) procedures were performed using a femoral approach. While, 339 (19%) cases were performed by radial approach.

Table 1 and Table 2 demonstrate patient characteristics and procedural indices respectively.

Table 1. Patient Characteristics

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Femoral (n=1,438)</th>
<th>Radial (n=339)</th>
<th>Radial Early (n=161)</th>
<th>Radial Late (n=176)</th>
<th>p value, Femoral vs. Radial</th>
<th>p value, Radial Early vs. Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>62.7 ± 13.6</td>
<td>62.7 ± 13.7</td>
<td>64.9 ± 13.7</td>
<td>60.5 ± 13.2</td>
<td>0.04</td>
<td>0.005</td>
</tr>
<tr>
<td>Male Gender</td>
<td>915 (63)</td>
<td>208 (63)</td>
<td>104 (66)</td>
<td>104 (66)</td>
<td>0.27</td>
<td>0.43</td>
</tr>
<tr>
<td>Hypertension</td>
<td>915 (63)</td>
<td>230 (68)</td>
<td>109 (67)</td>
<td>122 (69)</td>
<td>0.14</td>
<td>0.56</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>416 (29)</td>
<td>109 (32)</td>
<td>53 (32)</td>
<td>56 (32)</td>
<td>0.87</td>
<td>0.21</td>
</tr>
<tr>
<td>CHF</td>
<td>284 (17)</td>
<td>70 (21)</td>
<td>43 (26)</td>
<td>27 (15)</td>
<td>0.29</td>
<td>0.02</td>
</tr>
<tr>
<td>Previous MI</td>
<td>203 (13)</td>
<td>38 (11)</td>
<td>29 (18)</td>
<td>13 (7)</td>
<td>0.29</td>
<td>0.02</td>
</tr>
<tr>
<td>Previous PCI</td>
<td>328 (23)</td>
<td>74 (22)</td>
<td>35 (21)</td>
<td>39 (23)</td>
<td>0.26</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Indicators for Catheterization

CHF: 416 (29) vs. 93 (27) p<0.001
Stable Angina: 201 (13) vs. 12 (7) p<0.001
Unstable Angina: 319 (25) vs. 59 (36) p<0.001
STEMI: 222 (15) vs. 22 (13) p<0.001

Values reported as mean ± standard deviation or n (%); * p<0.05 vs. femoral approach; † p=0.05 early vs. late radial experience.

Table 2. Procedural Trends

<table>
<thead>
<tr>
<th>Indices</th>
<th>Femoral (n=1,438)</th>
<th>Radial (n=339)</th>
<th>Radial Early (n=161)</th>
<th>Radial Late (n=176)</th>
<th>p value, Femoral vs. Radial</th>
<th>p value, Radial Early vs. Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI</td>
<td>513 (36)</td>
<td>93 (27)  *</td>
<td>40 (25)</td>
<td>53 (30)</td>
<td>0.004</td>
<td>0.25</td>
</tr>
<tr>
<td>Fluoro Time (min)</td>
<td>18.3 ± 6.8</td>
<td>18.5 ± 8.7</td>
<td>18.8 ± 8.9</td>
<td>14.9 ± 14.1</td>
<td>0.38</td>
<td>0.03</td>
</tr>
<tr>
<td>Proc Time (min)</td>
<td>89 ± 40</td>
<td>68 ± 43</td>
<td>73 ± 47</td>
<td>63 ± 29</td>
<td>0.34</td>
<td>0.02</td>
</tr>
<tr>
<td>Contrast (ml)</td>
<td>136 ± 100</td>
<td>169 ± 100</td>
<td>180 ± 106</td>
<td>158 ± 79</td>
<td>0.17</td>
<td>0.03</td>
</tr>
<tr>
<td>Periprocedural Complications</td>
<td>8 ± 2</td>
<td>2 ± 1</td>
<td>1 ± 1</td>
<td>1 ± 1</td>
<td>0.94</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Values reported as mean ± standard deviation or n (%); * p<0.05 vs. femoral approach; † p=0.05 early vs. late radial experience.

Conclusions

TRCC is safe and comparable to TFCC when performed by operators in training.

Procedural time, fluoroscopy time, and contrast utilization of TRCC each decrease significantly within six months of training.

Training programs should be encouraged to adopt TRCC as part of their curriculum.

Limitations

Single center experience.
Cannulation time for arterial access not known.
Number of catheters/corony artery not measured.
Fluoroscopy and procedure times for PCI were not separately documented.

Disclosures

Note
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**Background:**
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**Methods:**
Beginning in April, 2010, trainees at UC Davis Medical Center participated in TRCC, with cardiology fellows being the primary operators. Procedural variables and clinical outcomes of TFCC were compared with TRCC. To reflect the learning curve of TRCC, we also compared the first six months (n=163) of the TRCC cohort with the second six months (n=176).
Results:
A total of 1,777 cardiac catheterizations were performed from April 2010-March 2011, with 339 (19%) TRCC cases. Baseline patient characteristics and procedural indices are summarized in Table 1. Overall procedural success rate was 95.6% (n=324) in the TRCC group and 99.9% (n = 1436) in the TFCC group, with low periprocedural and vascular complication rates in both groups. When the first six months of TRCC was compared to the second six months of TRCC, fluoroscopy time (18.8± 18.9 vs. 14.9± 14.1 min, p =0.03) and contrast utilization (180 ± 104 vs. 158 ± 78 mL, p = 0.03) each decreased significantly.

Conclusions:
TRCC is safe and comparable to TFCC when performed by operators in training, and training programs should be encouraged to adopt TRCC as part of their curriculum. Procedural time, fluoroscopy time, and contrast utilization of TRCC each decrease significantly within six months of training.