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

Usman Javed, Ehrin Armstrong, Jeffrey Southard, Kristopher Klem, Andrew Kwa, Garrett Wong, Khung Yeo, Reginald Low, John Laird, Jason Rogers

Division of Cardiovascular Medicine, UC Davis Medical Center

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, 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

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

Patient Characteristics	Femoral (n = 1,438)	Radial (n = 339)	Radial Early (n = 163)	Radial Late (n = 176)	*p* value, Femoral vs. Radial	*p* value, Radial Early vs. Late
BSA (m^2)	1.98 ± 0.27	1.97 ± 0.26	1.97 ± 0.27	2.01 ± 0.28	0.66	0.19
Age	62.7 ±12.6	62.3 ± 13.7	64.3 ±12.7	60.5 ± 12.3[a]	0.04	0.005
Male Gender	915 (63)	208 (61)	104 (64)	104 (64)	0.27	0.43
Hyperlipidemia	921 (64)	230 (68)	108 (66)	122 (69)	0.04	0.56
PVD	77 (5)	23 (7)	12 (7)	11 (6)	0.16	0.83
Diabetes Mellitus	486 (38)	109 (32)	53 (32)	56 (32)	0.87	0.21
CHF	244 (17)	70 (21)*	43 (26)	27 (15)[a]	0.03	0.001
Previous CABG	193 (13)	38 (11)	25 (15)	13 (7)[a]	0.29	0.02
Previous PCI	328 (23)	74 (22)	35 (21)	39 (22)	0.26	0.89
Indications For Catheterization						
CHF	430 (30)	93 (27) *	48 (29)	45 (26)	0.006	0.71
Stable Angina	281 (19)	54(16) *	12 (7)	42 (24)[a]	0.002	0.0001
Unstable Angina	359 (25)	101 (29)	59 (36)	42 (24)[a]	0.08	0.017
NSTEMI	239 (17)	46 (14)	28 (17)	18 (11)	0.63	0.06
STEMI	142 (10)	27 (8)	17 (10)	10 (6)	0.56	0.1

Values reported as mean ± standard deviation or n (%); *, $p<0.05$ vs. femoral approach; [a], $p<0.05$ early vs. late radial experience.

Table 2. Procedural Trends

Indices	Femoral (n = 1,438)	Radial (n = 339)	Radial Early (n = 163)	Radial Late (n = 176)	*p* value, Femoral vs. Radial	*p* value, Radial Early vs. Late
PCI	513 (36)	93 (27) *	40 (25)	53 (30)	0.004	0.25
Fluoro Time (min)	18.8 ± 16.8	18.5 ± 18.7	18.8 ± 18.9	14.9 ± 14.1[a]	0.38	0.03
Proc Time (min)	69 ± 40	68 ± 43	73 ± 47	63 ± 29[a]	0.34	0.02
Contrast (ml)	186 ± 102	167 ± 109	180 ± 104	158 ± 78[a]	0.17	0.03
Periprocedural Complications						
MI	8	2	1	1	0.94	0.96
CVA	4	2	1	1	0.34	0.96
Severe bleeding	13	5	2	3	0.41	0.14

Values reported as mean ± standard deviation or n (%); *, $p<0.05$ vs. femoral approach; [a], $p<0.05$ early vs. late radial experience.

Results

Overall procedural success rate was high with minimal crossover rate:

- 95.6% (n=324) in the TRCC group
- 99.9% (n=1,436) in the TFCC group

Patients who underwent TRCC were more likely to have chronic heart failure or stable angina and less likely to get PCI.

Procedure/fluoroscopy times and contrast use were not significantly different between TRCC and TFCC groups.

Periprocedural and vascular complication rates were low in in both groups.

When the first six months of TRCC was compared to the second six months of TRCC, fluoroscopy time and contrast utilization each decreased significantly.

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/coronary artery not measured.
Fluoroscopy and procedure times for PCI were not separately documented.

Disclosures

None

UCDAVIS

Procedural Trends Associated with Successful Initiation of a Transradial Program at an Academic Training Institution

Usman Javed, Ehrin J. Armstrong, Jeffrey Southard, Khung Keong Yeo, Garrett Wong, Kristopher Klem, John R. Laird, Reginald I. Low, Jason H. Rogers

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. We describe procedural variables and clinical outcomes of TRCC in a teaching program.
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.