

## 동일 요골동맥을 이용한 반복 시술 시 요골동맥의 크기 변화 및 시술 결과

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### The Changes of Radial Arterial Diameter and Procedural Outcomes of Repeated-use Radial Artery in Transradial Coronary Procedure

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#### ABSTRACT

**Background and Objectives :** Practical concerns about transradial approach are increasing in consideration of high procedural success rate, low local complications, and patient's convenience. There was no available data about repeated-use of radial artery for coronary procedures. We evaluate the changes of radial arterial diameter and procedural outcomes of repeated transradial procedure. **Materials and Methods :** Of consecutive 1771 transradial coronary procedures, 117 patients received repeated transradial procedures through the same radial artery. Radial arterial diameter, vascular access time and procedural outcomes were evaluated in between the group of first-use and repeated-use of radial artery. **Results :** Among 117 patients of second transradial coronary procedure in the repeated-use group, 47 patients (41.6%) underwent coronary intervention and 66 patients (58.4%) underwent coronary angiography. The right radial approach was used in 82.9% of the cases. There was no significant difference in radial artery mean diameter between pre-procedure and 1 day after procedure in patients with first-use and repeated-use group. There was no significant change of radial arterial diameter after first-use depending on the SAR (the ratio of sheath outer diameter to radial artery inner diameter). However, after repeated-use of radial artery, there was significant reduction of radial arterial diameter 1 day after procedure in the patients with SAR more than 0.9 ( $p < 0.05$ ). In repeated-use group, the mean radial arterial diameter was  $2.63 \pm 0.35$  mm before the procedure and  $2.51 \pm 0.29$  mm during follow-up ( $136 \pm 123$  days) ( $p < 0.05$ ). There was no significant difference of the vascular access time between the first-use and repeated-use procedures ( $2.9 \pm 3.1$  vs  $3.3 \pm 3.6$  minutes,  $p > 0.05$ ). The procedural success and vascular complication rate of repeated-use of radial artery were as similar to those of the first-use, but total occlusion of radial artery was higher in the repeated-use group (2.6% vs 0.7%,  $p < 0.05$ ). **Conclusion :** The diameter of radial artery after transradial procedures was significantly reduced during follow-up and the incidence of

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asymptomatic radial artery occlusion was more frequent after repeated-use. However, repeated-use of radial artery was feasible in most patients with high procedural success rate and low vascular complications. (**Korean Circulation J 2000;30(12):1501-1506**)

**KEY WORDS** : Radial artery · Coronary angiography · Coronary angioplasty.

## 서 론

TRAMARK<sup>®</sup>9 ; Advanced Technology Laboratories Inc., Bothell, WA, USA)<sup>1)7)</sup> 가 , Allen Allen test . Allen test Doppler flow . 6 가 Doppler . (the ratio of sheath outer diameter to radial artery inner diameter : SAR)

## 대상 및 방법

대 상 1997 4 1999 7 가 1997 4 1999 7 Allen 가 ,<sup>1)7)</sup> Killip , IABP 가 1771 2 117 (2 102 , 3 11 , 4 4 ) - Allen 2 2 가 3 4 . 방 법 SPSS 8.0 (SPSS Inc., Chicago. IL, USA) 가 (UL - t - SAR

ANOVA  
Chi - square . p 0.05

, 80 (68.4%) 1  
(Table 2).

## 결 과

### 시술 후 요골동맥 내경의 변화

임상적 특징

1771 117  
(6.6%) 60 ± 11 가 mm, 1 2.61 ± 0.37 mm , 2.64 ± 0.44 mm  
48 (41%) . 2.53 ± 0.39 mm 1 2.51 ± 0.29 mm 2.63 ± 0.35

PTCA  
63 (53.8%) 가 , 33 1 가  
(28.2%), 15 (12%), (p>0.05).  
6 (5.1%) (Table 1).

요골동맥을 통한 반복 시술의 특성

1160 (70.1%) , 97 (82.9%) 가 (0.03 0.10 mm), SAR 0.91 0.99  
0.18 ± 0.07 mm 가  
가 96 1.0 0.17 ± 0.06 mm  
(82.1%) , 가 0.90  
가 (p<0.05, Fig. 2).

47  
(41.6%) 70 (59.8%) 2.63 ± 0.35 mm 136 ± 123  
8 가 2.53 ± 0.39 mm  
37 (31.6%) 30 (81.1%) (p<0.05, Fig. 1).

**Table 1.** Baseline clinical data

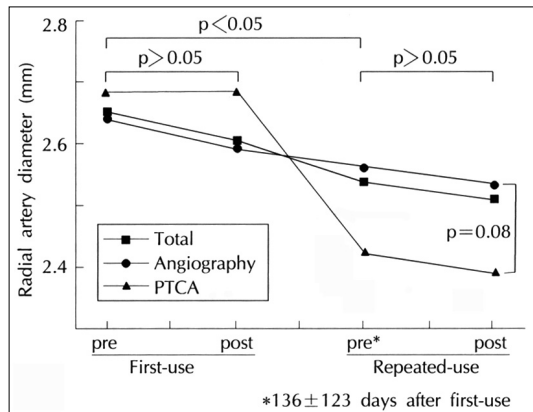
	Repeated	use
No. of patients	117	1654
Age (years)	60.1 ± 11.2	60.5 ± 10.2
Male (%)	48 (41.0)	966 (58.4)
Clinical diagnosis		
Stable angina		458 (27.7)
Unstable angina	33 (28.2)	422 (25.5)
Vasospastic angina		45 ( 2.7)
Atypical chest pain		192 (11.6)
Acute MI	15 (12.8)	192 (11.6)
Old MI		63 ( 3.9)
Follow-up	63 (53.8)	108 ( 6.5)
Others*	6 ( 5.1)	174 (10.5)

MI : myocardial infarction

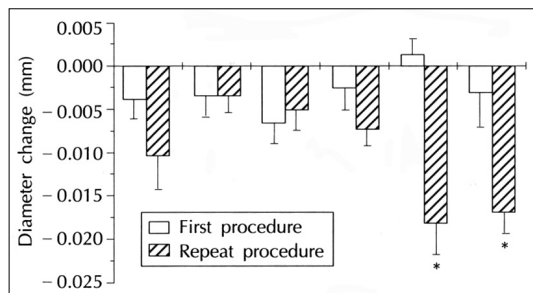
\* : silent ischemia, preoperative evaluation, peripheral, et al.

**Table 2.** Distributions of vascular access site and procedures

	Repeated-use (n= 117)	First-use (n= 1654)
Access site (%)		
Right	97 (82.9)	1160 (70.1)
Left	20 (17.1)	494 (29.9)
Type of first procedure		
Diagnostic	96 (82.1)	1324 (80.0)
Angioplasty	21 (17.9)	330 (20.0)
Type of second procedure		
Diagnostic	70 (59.8)	
Angioplasty	47 (40.2)	
Days after prior procedure	136 ± 123	
Within 8 days	37 (31.6)	
Beyond 8 days	80 (68.4)	



**Fig. 1.** Time course of radial arterial diameter in repeated-use group. There was not a significant difference in radial arterial mean diameter between before procedure and 1 day after procedure. In repeated-use group, the mean radial arterial diameter was  $2.63 \pm 0.35$  mm before the first procedure and  $2.51 \pm 0.29$  mm late  $136 \pm 123$  days after the first procedure ( $p < 0.05$ ). There was no significant change of radial arterial diameter between the patient with diagnostic procedure and PTCA.



**Fig. 2.** Relation between diameter change of radial artery and SAR# (the ratio of sheath outer diameter to radial artery inner diameter) in repeated-use group. After the first procedure, there was no significant change of radial arterial diameter depending on SAR. But after repeated-use, there was significant reduction of radial arterial diameter 1 day after procedure of the patient with SAR more than 0.9.

**Table 3.** Procedural results and complications

	Repeated-use (n = 117)	First-use (n = 1654)
Vascular access time (min)	$3.3 \pm 3.6$	$2.9 \pm 3.1$
Radial arterial diameter (mean, mm)		
First procedure	$2.63 \pm 0.35$	$2.64 \pm 0.44$
Second procedure	$2.53 \pm 0.39$	
Sheath size (mean, Fr)		
First procedure	$5.3 \pm 0.61$	$5.2 \pm 0.59$
Second procedure	$5.5 \pm 0.72$	
SAR <sup>†</sup> (mean)		
First procedure	$0.68 \pm 0.12$	$0.67 \pm 0.22$
Second procedure	$0.70 \pm 0.12$	
Success rate (%)	15 (98.3)	1601 (96.8)
Cross-over <sup>‡</sup>	2 ( 1.7)	26 ( 1.6)
Puncture failure	0 ( 0)	17 ( 1.0)
Vascular complications (%)		
Perforations	0 ( 0)	7 ( 0.4)
Occlusion*	3 ( 2.6)	11 ( 0.7)
Major bleeding	0 ( 0)	0 ( 0)

<sup>†</sup> : the ratio of sheath outer diameter to radial artery inner diameter,

<sup>‡</sup> : cross-over to femoral artery, \* :  $p < 0.05$

cross - over  
가  
 $3.3 \pm 3.6$   
2.9 ±  
3.1  
가  
3 (2.6%),  
11 (0.7%)가  
( $p < 0.05$ )(Table 3).

고 안

가 가

( $p = 0.08$ , Fig. 1).

시술 결과 및 혈관 합병증의 비교

98.3%  
(96.8%) 가 ,

Nagai <sup>10)</sup> 0.15 ± 0.4 mm  
2.4 ± 0.4 mm

2

2.3±0.4 mm 3 2.2±0.4 가 .

가 1.3% 4Fr 0.8%

가 4 Fr 2.6% Nagai <sup>10)</sup> 2%

가 Saito <sup>12)</sup> 6.8% Stella <sup>14)</sup> 5.3%

가 SAR

가 Saito <sup>12)</sup> SAR 1 : 1 ,

가 ,

가

가

<sup>10)11)</sup> 가

2

SAR

가

1 SAR 가

SAR 0.9

Saito <sup>12)</sup>

1 : 1 , Saito SAR

13%

가 , SAR 1.1

4%

SAR 0.9 가

SAR 0.9

가

요 약

배경 및 목적 :

가

<sup>1)2)</sup>

대상 및 방법 :

가 1771

2 117

13)15)

결 과 :

1) 47 (41.6%)

66 (58.4%)

97 (82.9%)

2) 136

(p<0.05).

1 (

2.64±0.44 mm, 1 2.61±0.37 mm, p>0.05), 가 0.9

1

(p<0.05).

3) 가

(2.6% vs. 0.7%,

p<0.05) 가 .

결 론 :

중심 단어 :

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