

요골동맥을 이용한 관상동맥 조영술 및 중재술의 유용성과 문제점

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최영진 · 두영철 · 이남호 · 홍경순 · 유규형 · 임종윤 · 이광학 · 이영

Feasibility and Problems in Transradial Coronary Angiography and Intervention

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ABSTRACT

Background and Objectives : The transradial coronary angiography and intervention is on the increase with its satisfactory results. It gives advantages of reduced vascular complication and increased comfort of patients. We evaluated the feasibility and problems of transradial coronary angiography and intervention as a routine procedure. **Materials and Method :** Between February 1998 and December 1999 transradial approach was attempted in 750 patients with normal Allen test. Radial angiography was performed to assess the radial artery spasm and tortuosity. Arterial sheath was removed immediately after the procedure and vascular complications were evaluated before discharge. **Results :** Radial artery puncture was successful in 738 (98%) patients. Transradial coronary angiography was successful in 719 (96%) patients. We failed in coronary angiography in 19 patients and the main reasons were tortuous subclavian artery in 11 patients and radial artery spasm in 5 patients. Transradial coronary angioplasty was performed successfully in 185 (95%) of 194 patients. In 9 patients intervention was switched to transfemoral approach because of tortuous subclavian artery. Complications were severe radial artery spasm in 13 (1.8%), minor subcutaneous hemorrhage in 7 (0.9%), non-ischemic radial artery occlusion in 4 (0.5%) and radial artery perforation in 1 (0.1%). But, there were no major complications requiring vascular surgery or transfusion. **Conclusion :** Transradial coronary angiography and intervention might be useful and safe as a routine procedure. The major limitations in transradial approach were radial artery spasm and tortuosity of brachial or subclavian artery. (**Korean Circulation J 2000;30(9):1083-1091**)

KEY WORDS : Transradial · Coronary angiography · Coronary intervention.

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773

서 론 Allen 가 750 Allen intraaortic balloon pump(IABP) 가 ,

Idinger¹⁾ 1953 Se - Seldinger technique , 1959 Sones²⁾ Sones (Sones technique) Seldinger (Seldinger technique) 요골동맥 천자 (femoroiliac artery) (styloid process) 가 , 1 cm 2% (1 2 cc) 가 , 11 , 3) (median nerve) 18 G IV catheter needle 10 cm 4) 5F (Radifocus introducer II) , Campeau⁵⁾ 1989 6 8F , 1992 Kiemen - 5,000 unit heparin , (tortuosity) 가 . (nitroglycerin 200 µg, verapamil 100 µg, lidocaine 10 mg, 10 ml) 가 .

대상 및 방법

연구대상 1998 2 1999 12

관상동맥 조영술 3 side hole 가 4F Multipurpose (Jung Sung, Korea) 5F Judgkins 5F Amplatz 가 (Radiofo - cus Guidewire M. 0.032 150 cm, Terumo, Japan)

가 .
 .
 (Radiofo -
 cus Guidewire M, 0.035" 260 cm, Terumo, Japan)
 . 4F Multipurpose
 가

통계분석

SPSS for Windows v8.0

± ,
 (%) .

결 과

관상동맥 연속유발시험

대상환자 및 임상특성

1998 2 1999 12
 750
 194 ,
 60 (59.6 ± 9.2) 가 518 (69%) .
 279 (37%) 가 가
 230 (31%),
 114 (15%), 78 (10%)
 , 49 (7%)

관상동맥 중재술

Jud -

(Table 1).

kins Amplatz
 . Judkins Amplatz
 Kimny , Hockeystick

요골동맥을 이용한 관상동맥 조영술

Allen 가 750 738 (98%)
 , 719 (96%)
 가 738
 509 (69%)
 , 229 (31%)
 201 (28%) , 2 237 (33%), 3
 64 (9%) , 18
 (3%) (Table 2). 209

유도초의 제거와 지혈

, (4 × 8") 가 2 3
 .
 4
 가 .

Table 1. Clinical characteristics of the 750 cases

Age (years)	59.6 ± 9.2
Male gender	518 (69%)
Clinical diagnoses	
Unstable angina	279 (37%)
Acute myocardial infarction	230 (31%)
Stable angina	114 (15%)
Old myocardial infarction	78 (10%)
Atypical chest pain	49 (7%)

(29%) Multipurpose , 474 194 ,
 (66%) Judkins left , 36(5%) Am -
 platz left .
 424 (59%) Multipurpose , 가 9 185 (95%),
 273 (38%) Judkins right , 22 (3%) 204
 Amplatz right (Table 3).
 9
 가 11
 (1.5%), 5 (0.7%), 69
 2 (0.3%) (37%) , 12
 1 (0.1%) 19 (Table 4). 가 3 ,
 가

요골동맥을 이용한 관상동맥 중재술

2 , 24

Table 2. Angiographic data

Successful transradial approach	738/750 (98%)
Right radial approach	509 (69%)
Left radial approach	229 (31%)
Successful transradial CAG	719/750 (96%)
Normal or minimal lesion	187 (26%)
1 vessel disease	201 (28%)
2 vessel disease	237 (33%)
3 vessel disease	64 (9%)
Left main disease	18 (3%)
Coronary spasm test	12 (1%)

CAG : coronary angiography

Table 3. Catheters used in transradial coronary angiography (N = 719)

Left coronary artery	
Multipurpose	209 (29%)
Judkins left	474 (66%)
Amplatz left	36 (5%)
Right coronary artery	
Multipurpose	424 (59%)
Judkins right	273 (38%)
Amplatz right	22 (3%)

Table 4. The causes of failure in coronary angiography (overall failure = 19)

Tortuous brachial and subclavian artery	11 (1.5%)
Radial artery spasm	5 (0.7%)
Inability to advance guidewire into the ascending aorta	2 (0.3%)
Radial artery perforation	1 (0.1%)

가 98 (48%) 가
 가 55 (27%), 51
 (25%) . A 14
 (7%) , B1 73 (36%), B2 88
 (43%) , C 29 (14%) .
 133 (72%) ,
 52 (28%)
 . 204 131 (64%)
 가 , 3 rotablation
 (Table 5).
 rotablation 3

Table 5. Transradial coronary intervention in 185 patients (204 lesions)

Target vessels	
Left anterior descending artery	98 (48%)
Left circumflex artery	55 (27%)
Right coronary artery	51 (25%)
Lesion types	
A	14 (7%)
B1	73 (36%)
B2	88 (43%)
C	29 (14%)
One-stage PTCA	165 (89%)
Two-stage PTCA	20 (11%)
Right TRI	133 (72%)
Left TRI	52 (28%)
Stent implantation	131 (64%)
Rotablation	3 (2%)

TRI : trans-radial coronary intervention

Table 6. Guiding catheters used in transradial coronary intervention

LAD	
Judkins left	77 (79%)
Kimny	12 (12%)
Amplatz left	9 (9%)
LCX	
Judkins left	27 (49%)
Amplatz left	25 (46%)
Kimny	3 (5%)
RCA	
Judkins right	29 (56%)
Amplatz right	12 (25%)
Amplatz left	7 (13%)
Hockeystick	3 (6%)

Table 7. Complications

Puncture-related complications (N = 738)	
Radial artery spasm	13 (1.8%)
Minor subcutaneous hemmorrhage	7 (0.9%)
Radial artery occlusion	4 (0.5%)
Radial artery perforation	1 (0.1%)
Procedure-related complications (N = 185)	
Hypotension	2 (1.1%)
Ventricular tachycardia	1 (0.5%)
Sinus bradycardia	1 (0.5%)
No-reflow phenomenon	1 (0.5%)
Acute myocardial infarction	0
Cerebrovascular complication	0
Death	0

7F , 6F
가
77 (79%) Judkins left ,
12 (12%) Kimny , 9 (9%) Am - 11
platz left 가
27 (49%) Judkins left 12)
, 25 (46%) Amplatz left , 3
(5%) Kimny 가
29 (56%) Judkins right
, 12 (25%) Amplatz right
, 7 (13%) Amplatz left , 3 (6%)
Hockeystick (Table 6).

시술과 관련된 합병증

가 13 (1.8%) ,
7 (0.9%) 1 2
가 4 (0.5%)
1 (0.1%)
,
2 (1.1%) ,
, noreflow 1 (0.5%)
(Table 7).

고 찰

가
,
가
가
가
가
Kiemeneij 10) 900
,
Park 11)
, Yoon
Cha 13)
(learning curve)

가

Allen 검사
Allen 1929 3 thromboangitis obliterans
(patency)
가
가 유도초 삽입후와 제거후의 항응고요법
2.5 10%
5)6)
10
가
가
15)
Allen
가
773
750 (97%)
(3%) Allen
우측 또는 좌측 요골동맥의 선택
Wu 7)
가
가
가
3
가
가
가 4
도관의 선택
4 Fr Multipurpose
194 (27%)

가 2 ,

가 24 ,

4 Fr Multipurpose 24

가

5 Fr Judkins Amplatz

가

6 Fr

Judkins Amplatz

가 ,

. Yoon ²¹⁾ Cha ²²⁾ Ochiai ²³⁾

Hockeystick Kimny ²⁰⁾

, Rotablator

7 Fr Judkins

가 87 (69%) 가 ,

가

, Multipurpose

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12

1 . 12

가

31 (4%)

가 12 ,

가 11 ,

verapamil nitroglyce -

rin

가 5 ,

가 2 ,

가 1

요골동맥을 이용한 관상동맥 중재술

9 (5%)

가 6F

가

6F

가

가

가 3 ,

시술 및 천자부위와 관련된 합병증의 분석

방 법 :
 , Noreflow 1 2 1998 2 1999 12 Allen test가
 750 719 185
 , 가
 5)6)24) 가
 가 19)
 20 guage (cannula) 가
 25 38% 25-27) 결 과 :
 1) Allen test가 750 738 (98%)
 , 719 (96%)
 . 2).
 17)19)
 가 4 (0.5%) 가 11 (1.5%),
 5 (0.7%),
 Allen 가 2 (0.3%)
 가 1 (0.1%) 19 . 3)
 2 6 194
 28)
 , 9 185 (95%)
 가 . 4)
 13 (1.8%)
 7 (0.9%), 가 4
 1 (0.1%)
 관상동맥 조영술 및 중재술을 시행하는데 있어서 일상 (0.5%),
 적인 요골동맥 이용의 가능성 Allen
 가 결 론 :

요 약

중심 단어 :

연구배경 :

1999

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