

Wire-Loop Technique

1

. . . . 1

Wire-Loop technique

280

가 30

가 22 , 8 14:16

27 - 77 (51.3) . 16 , 14 .

Wire-Loop technique

3 , 4 , 5 ,

1 , 1 . Snare technique

4 - 20 mm

Wire-Loop technique 86.7%(26/30) . 4 1

가 , 2 50% 1

가 40 210(105) 3

4, 6, 12 80%(24/30), 61%(19/30), 30%(9/30) .

Wire-Loop technique 가 , 79.3%

(222/280) Wire-Loop technique 88.6%

(248/280)

가 Wire-Loop technique

2 (1),
(PTA)
(2-4). 97 4 99 6

PTA PTA 280

가 Wire-Loop tech- 30 가 14 , 가 16

가 PTA 27 77 (, 51.3) . 5

13 (, 62) 1

144 (, 32) .

가 , , .

18 가

가 9 , 가 2 , 1 .

Table 1, 2 .

¹
²

2000 3 14

2000 8 8

PTA
(Cook, Bloomington, U.S.A.) hair
wire (Cook, Bloomington, U.S.A.) 9 가 , Gore - tex
2 Urokinase(, ,)100,000 IU
200,000 IU
7 Desilet - Hoffman sheath (Cook, Bloomington, U.S.A.) . 5F Cobra
catheter(Cook, Bloomington, U.S.A.) 0.035 inch
(Terumo, Tokyo, Japan)

Table 1. The Types of AVF

Type	Number
Radio-cephalic	21
Brachio-cephalic	3
Brachio-basilic	2
Brachio-axillar	2
Brachio-brachial	1
Brachio-jugular	1
Total	30

(Blue
Max; Boston Scientific, U.S.A.)
(Fig. 2A) 가 (Fig. 1B).
150
cm 0.018 inch (Terumo, Tokyo, Japan)
snare technique 0.035
inch (Fig. 2B). Wire - Loop
technique Table 3 .

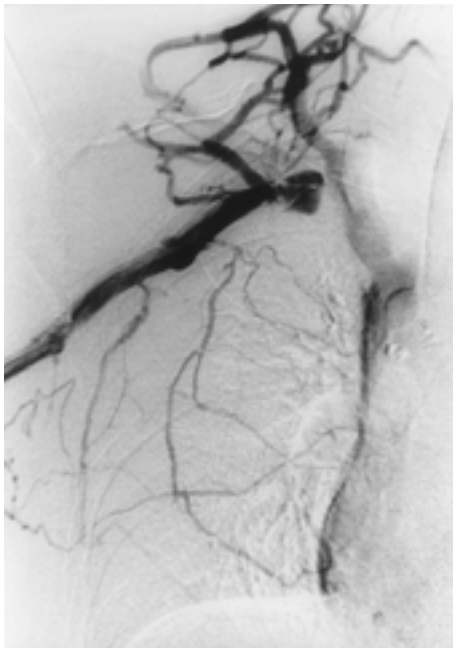
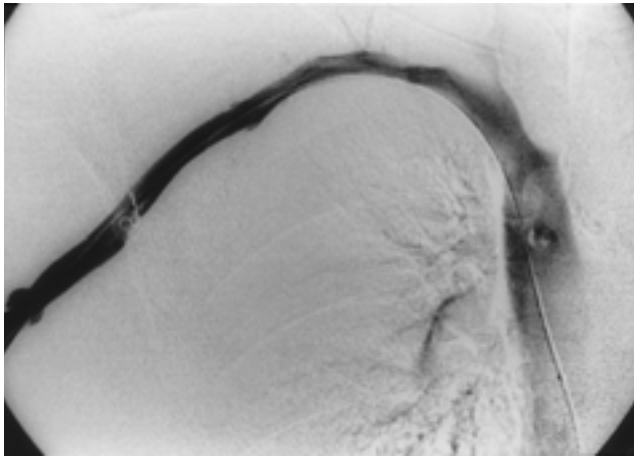
Table 2. The Sites of Occlusion

Occlusion site	Number
Cephalic v*	9
Innominate v	9
Subclavian v	7
Gore-tex-vein anast [†]	3
Median cubital v	1
Radio-cephalic anast	1
Total	30

*V:vein
anast:anastomosis



Fig. 1. 40-year-old-man with radio-cephalic fistula.
A. Fistulogram shows a tortuous and multiple stenosis at the cephalic vein (arrows).
B. The guide wire was easily passed through the angulated stenotic portion, but the balloon catheter could not be advanced.
C. After a sheath was inserted at the just distal vein of the anastomosis, the guide wire was pulled out by using the snare wire and pulled both direction. Spot film shows waisting of stenosis when PTA.
D. Marked improvement of the stenosis and minor rupture (arrow) identified on the venogram obtained immediately after PTA with a 6 mm balloon.

**A****B****Fig. 2.** 30-year-old-man with radio-cephalic fistula.**A.** Fistulogram shows complete obstruction of the right subclavian vein with multiple collateral vessels.**B.** Wire-Loop technique of the basilic-femoral type was carried out. The guide wire was pulled out at the basilic vein using a snare wire.**C.** Post-PTA venogram shows no evidence of residual stenosis at the right subclavian vein.**C****Table 3.** Sites of Wire Loop Technique

Central stenosis site	number	Peripheral stenosis site	number
basilic-femoral v*	8	cephalic-cephalic v	4
cephalic-femoral v	3	cephalic-basilic v	3
Gore-tex-femoral v	2	cephalic-femoral v	3
int.† jugular-femoral v	1	Gore-tex-femoral v	2
brachio-femoral v	1	cephalic-radial a†	1
axillar-femoral v	1	cephalic-femoral a	1

* v:vein

† a:artery

‡ int.:internal

Heparin(, ,) 3,000IU

(Fig. 1C)

PTA

. Wire - Loop technique

가 (Fig. 2C)

(Fig. 1D)

50%

Wire - Loop technique

, Kaplan - Meier method

technique

30 26 (86.7%)

PTA

40 210 (, 105

)

60

210 ,

40

200

unpaired t - test p value가 0.7084

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4

1

가

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4

1

가

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4

1

가

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4

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가

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4

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가

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4

1

가

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4

1

가

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4

1

가

280
16 (33.3%),
(6%) Wire - Loop technique48
232 14
. Wire - Loop280 Wire - Loop technique
PTA 79.3%(222/280)
30 Wire - Loop technique
26 가 PTA
88.6%(248/280)

χ^2 - test χ^2 가 8.948 p value가 0.003

가

Wire - Loop technique

가

Wire - Loop technique 30 4, 6, 12
80.0%, 61.0%, 30.0%

PTA

14 7

가

, 5

3

, 2

가

, 가

(6).

2

PTA

. PTA

,

Wire - Loop technique

PTA

,

가

Wire - Loop

가

가

. 3

technique (7).

5

가

1

. Wire - Loop technique

5

Wire - Loop technique

PTA

가

(Fig. 1C) (8).

가

10.4mmol/L

가 가

Wire - Loop technique

Loose

(7)

40

39

1

. Wire - Loop technique

PTA

가

(7, 9, 10)

(11, 12)

가 (13).

, double J

(14).

(10)

3

10

. Ginsburg (9)

. Gaines

technique

(15 - 17)

snare

PTA

4

2

가

Wire - Loop technique

PTA

가

. Ingran (6)

Wire - Loop technique

가

가

7

가

PTA 3

가

Wire - Loop technique

가

PTA

PTA

Wire - Loop tech -

nique

79.3%(222/280)

Wire - Loop technique

88.6%(248/280)

technique

33.3%

6%

Wire - Loop

PTA

가

PTA

가

가

가

가

Wire - Loop technique PTA

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The Usefulness of Wire-Loop Technique for Percutaneous Angioplasty of Insufficient Hemodialysis Fistula¹

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Purpose: To evaluate the usefulness of the Wire-Loop technique, used to perform percutaneous transluminal angioplasty (PTA) in occluded arteriovenous fistula when standard methods fail to pass the balloon catheter across the stenotic segment.

Materials and Methods: In 30 patients [M:F = 14:16; aged 27 - 77 (mean, 51.3) years], the Wire-Loop technique was used to perform percutaneous transluminal angioplasty of insufficiently hemodialysed arteriovenous fistula where a balloon catheter had failed to pass through the stenotic lesion after a guide wire had successfully passed. Native and Gore-tex fistula were used in 22 and eight cases, respectively. Sixteen stenoses were located in the central vein, and fourteen in the peripheral. The puncture sites used in order to perform the technique were the femoral vein in all cases of central stenosis; three basilic, four cephalic, and five femoral veins in cases of peripheral stenosis and one femoral and one radial artery in cases of anastomotic stenosis. The guide wire was passed through the stenotic lesion, pulled out using the snare technique, and then stretched in order to tighten it. The balloon catheter was then passed through the lesion and traditional balloon angioplasty was performed. The technical success rate and complications of the technique, and the patency rate of recanalized arteriovenous fistula, were evaluated.

Results: In 26 of the thirty patients, (86.7%), the procedure was technically successful. In the remaining four cases, failure was due to venous dissection (n = 1), marked residual stenosis (n = 2), or cardiac arrest (n = 1) during the procedure. The average procedure time was 105 (range, 40 - 210) minutes, and in three cases rupture of the vein occurred. The patency rate of PTA was 80% (24/30) at four months, 63% (19/30) at six months, and 30% (9/30) at twelve months. The expected technical success rate of traditional PTA, without the Wire-Loop technique, would have been 79.3%, but using the technique, the rate increased to 86.7%.

Conclusion: The Wire-Loop technique appears to be a safe and valuable procedure in patients with insufficiently hemodialysed arteriovenous fistula, and is therefore useful in cases in which traditional PTA fails.

Index words : Veins, transluminal angioplasty
Veins, stenosis or obstruction
Dialysis, shunts

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