

승모판 질환에 동반된 심방세동에 대한 고주파 절제술을 이용한 수술 중 폐정맥 분리술의 유용성

홍그루¹ · 신동구¹ · 박종선¹ · 김영조¹ · 심봉섭¹
이장훈² · 정태은² · 이동협² · 한승세²

Effects of Pulmonary Vein Isolation Using Intraoperative Radiofrequency Catheter Ablation for the Treatment of Atrial Fibrillation Associated with Mitral Valvular Heart Diseases

Geu Ru Hong, MD¹, Dong Gu Shin, MD¹, Jong Seon Park, MD¹,
Young Jo Kim, MD¹, Bong Sup Shim, MD¹, Jang Hoon Lee, MD²,
Tae Eun Jung, MD², Dong Hyup Lee, MD² and Sung Sae Han, MD²

¹Department of Internal Medicine, ²Thoracic Surgery, College of Medicine, Yeungnam University, Daegu, Korea

ABSTRACT

Background and Objectives : The pulmonary veins and surrounding ostial areas frequently house focal triggers or reentrant circuits critical to the genesis of atrial fibrillation (AF). The purpose of this study was to assess the efficacy of pulmonary vein isolation, aided by intraoperative radiofrequency catheter ablation, for the treatment of AF associated with mitral valvular heart disease. **Subjects and Methods :** 32 consecutive patients with AF associated with mitral valvular disease, requiring mitral valvular replacement or valvuloplasty were included. We divided these patients into two groups. The first group, PVI, consisted of 16 patients that had mitral valvular operations with intraoperative radiofrequency pulmonary vein isolation, and the other 16 patients, the controls, had mitral valvular operation only. The conversion rate to sinus rhythm and other clinical data were compared between the two groups. **Results :** Circumferential pulmonary vein isolation, with radiofrequency catheter ablation, was achieved in an average of 15 ± 3 min. There were no mortalities or morbidities associated with this procedure. In the immediate postoperative period, the conversion rate to normal sinus rhythm in the PVI group was significantly higher than in the controls (81% vs. 37.5% $p = 0.016$). After 21 ± 4 weeks of follow up, the sinus rhythm maintenance rates in PVI group was also significantly higher than those of the control group (75% vs. 31.2% $p = 0.01$). **Conclusion :** Circumferential pulmonary vein isolation, aided by intraoperative radiofrequency catheter ablation, is simple and effective for the treatment of chronic atrial fibrillation associated with mitral valvular disease. (*Korean Circulation J* 2002;32(7):596-603)

KEY WORDS : Atrial fibrillation ; Pulmonary veins ; Catheter ablation ; Heart valve diseases ; Mitral valve.

: 2002 3 19
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: , 705 - 035 317 - 1
: (053) 620 - 3843 · : (053) 654 - 8386 · E - mail : dgshin@medical.yeungnam.ac.kr

9)

. 가 ,

, 가

가 가 (driver) .²⁸⁾

가 가

.¹⁾ 1% , 60 ,

8 17% ,²²⁾²⁶⁾

80%가 가 .

,²⁷⁾

가 가

. 가 , 가 ,

가 가 가 .

가,²⁾³⁾

.

,

가

.

,

.

가 가 2)

대 상

1999 11 2001 4

Guiradon

4) (Corridor operation), 가 32 (7 , 25 , 5)8)31) , 49 ± 10) . 16 6)7)9)20) (PVI) , 16 () .

가 . , 90% . 20 (62.5%), 8) . 9 (28.1%), 가 3 (9%) . 26 (81.3%), 4 (12.5%), 2 (6.2%) . 28 (87.5%) 31) , 4 (12.5%) .

방 법

가

28 29
(Fig. 1)

5 6 cm 가
RF Ablation Cathter(7 Fr Blazer
II Ablation Catheter, EPT, USA) EPT 1000 Ca-
rdiac Ablation Generator

50 watt ,
60

30 (gap)

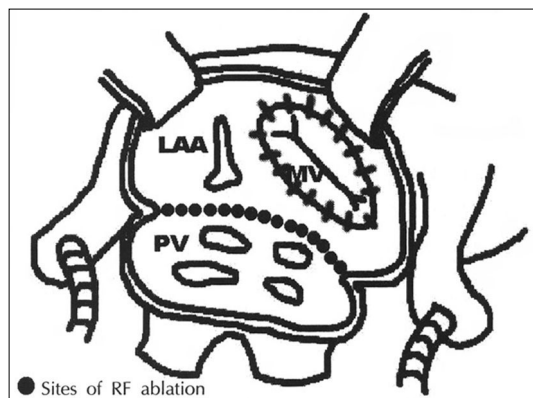


Fig. 1. Diagram illustrating scheme of endocardial radiofrequency (RF) ablation in LA. LAA : left atrial appendage, MV : mitral valve, PV : pulmonary vein.

24
PVI
20 ± 4 , 22 ± 3
24

통계 분석

±
SPSS (SPSS ver 10.0 for windows)
Student's
t - test chi square test . p 0.05
p 0.05
0.09

결 과

대상환자의 특성

PVI 49 ± 9 ,
49 ± 12 가 ,
NYHA class, 가

(Table 1).

2 3 PVI

수술소요시간

ACC(Ao-
rtic Cross Clamp) time PVI 137 ± 34 ,
120 ± 17 가 , CPB
(Cardiopulmonary Bypass) time PVI
170 ± 40 , 159 ± 25
가 (Table 2). PVI
323 ± 42 , 297 ± 42
가

Table 1. Clinical characteristics of the patients

	Control (n=16)	PVI (n=16)	P
Age (yrs)	49 ± 12	49 ± 9	NS
Sex (male)	4	3	NS
CVA history	1	2	NS
Hypertension	1	1	NS
Diabetes	1	1	NS
NYHA class	3.0 ± 0.6	2.7 ± 0.6	NS
AF duration (yrs)	6.2 ± 3.5	5.9 ± 3.9	NS
Echocardiographic findings			
LAD (cm)	5.4 ± 0.9	5.1 ± 0.6	NS
LVEF (%)	52 ± 10	55 ± 13	NS
E velocity (cm/sec)	95 ± 29	90 ± 37	NS
LA thrombus	3	4	NS
Cardiac catheterization			
PApr (mean, mmHg)	33 ± 4	29 ± 7	NS
LAPr (mean, mmHg)	19 ± 5	22 ± 10	NS

PVI : pulmonary vein isolation, CVA : cerebrovascular accident, AF : atrial fibrillation, LAD : left atrial dimension, LA : left atrium, PApr : mean pulmonary arterial pressure, LAPr : mean left atrial pressure, NYHA : NewYork heart association

Table 2. Comparison of procedure-related time and follow-up results between 2 groups

	Control (n=16)	PVI (n=16)	P
ACC time (minutes)	120 ± 17	137 ± 34	NS
CPB time (minutes)	159 ± 25	170 ± 40	NS
OP time (minutes)	297 ± 42	323 ± 42	NS
PVI time (minutes)		15 ± 3	
In-hospital stay (days)	16 ± 6	15 ± 5	NS
Death	1	1	NS

ACC : aortic cross clamp, CPB : cardiopulmonary bypass, OP : operation, PVI : pulmonary vein isolation

15 ± 3 (Table 2).

동율동 전환율 (Table 3, Fig. 2)

PVI 13 (81%)

6 (37.5%)

(p=0.016). 21 ± 4 PVI

12 (75%)

5 (31.2%) (p=0.01).

PVI 3

, 13 . 13 10

Table 3. Comparison of normal sinus rhythm (NSR) conversion rate between 2 groups

	Control (n=16)	PVI (n=16)	P
Follow-up duration (wks)	22 ± 3	20 ± 4	NS
Success, immediate postop (%)	6 (37.5)	13 (81.2)	0.016
Success, follow-up (%)	5 (31.2)	12 (75.0)	0.01

PVI : pulmonary vein isolation, NS : not significant

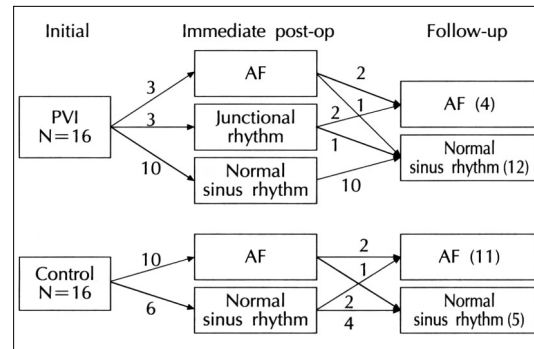


Fig. 2. Rhythm change after circumferential pulmonary vein isolation in PVI (pulmonary vein isolation) and control group. AF : atrial fibrillation.

Table 4. Postoperative echocardiographic change in two groups

	Control (n=16)	PVI (n=16)	P
LA size (cm)	4.6 ± 0.9	4.4 ± 0.4	NS
LVED (cm)	51 ± 6	48 ± 7	NS
LVEF (%)	50 ± 19	56 ± 11	NS
E wave velocity (cm/sec)	95 ± 29	90 ± 37	NS
A wave velocity (cm/sec)	49 ± 17*	57 ± 20	NS

* : data of 5 control patients who recovered normal sinus rhythm after operation, LA : left atrium, LVED : left ventricular end-diastolic dimension, LVEF : left ventricular ejection fraction, PVI : pulmonary vein isolation

, 3 (junctional rhythm)

3

6

2

10 1

(Table 3).

술후 심초음파도상 좌심방의 수축기능

가

5.4 ± 0.9 cm, PVI 5.1 ± 0.6 cm
 4.6 ± 0.9 cm, 4.4 ± 0.4 cm . 가 가 .¹¹⁾

A , Kosakai¹⁵⁾ 84% ,
¹⁶⁾ 90% . ,

(Table 4).

고 찰¹⁷⁾
 가 , , ,
 79% .³⁾

, , co-
²⁾ , , mpartment operation, radial operation
 가 , ,¹²⁾ .
²¹⁾ .
 , , (pulmonary vein isolation)
 , , proarrhyth-
¹³⁾ mia
 가 . Sueda²⁶⁾²⁷⁾
 , Melo⁹⁾
 , Pappone²⁰⁾ . Su-
 eda 86 91%(74%)
 , Melo 62% , Pappone 85%)
 62%(3) 4
 Corridor⁹⁾ 14)
 (sinus impulse)가 ,
 , 82%
 81%, 75%
 ,
²⁹⁾
 Sueda
 Cox⁵⁾⁸⁾ ,
 가
 (Maze procedure) 1987
 가 . 90% 83% .⁶⁾⁷⁾

가 ,

. Haissaguerre ¹⁰⁾ Jais ¹⁹⁾ 가

, 가

, ¹⁸⁾ . PVI

가 ,

, 가 (slurred upstroke)

, 가 ²⁰⁾

가 (arrhythmogenic) time ACC(aortic cross clamp) CPB(cardiopulmonary bypass) time, 가

, (remodeling) 15 ± 3 Melo ⁹⁾ 7 ± 4

가 가 가

가 가 , ²²⁾²³⁾

(driver) PVI 3

, 13 , 10

(initiation) () , 3 (junctional rhythm)

(maintenance) 3 2

, ,

20%

²⁴⁾ , 3

²⁵⁾ 6

2

(debulking) , (ligament of Marshall) 10 1

(denervation) (Table 3). PVI

81%, 5 75% 38%,

31% proarrhythmia

가

(reentrant wavefront) 가

A 57 ± 20 cm/sec ,

90 ± 37 cm/sec
71 93%

94 99%

방 법 :

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32

16

, 16

결 과 :

PVI 13 (81%)

6 (37.5%)

(p=0.016).

21 ± 4

PVI

12 (75%)

5 (31.2%)

(p=0.01).

15 ±

3

결 론 :

가

연구의 제한점

21 ± 4

중심 단어 :

;

;

;

;

2001

요 약

배경 및 목적 :

가

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