

대혈관전위의 동맥전환술후 대동맥판 폐쇄부전*

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= Abstract =

Aortic Insufficiency after Arterial Switch Operation in Transposition of the Great Arteries

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Background : The arterial switch operation(ASO) has become a procedure of choice for transposition of the great arteries(TGA) with or without ventricular septal defect(VSD). In spite of current low surgical mortality in immediate surgical period, there are potential problems of late morbidity and mortality. In this study, we evaluate the prevalence and severity of aortic insufficiency(AI) and associated factors with AI.

Method : We retrospectively reviewed medical records and echocardiogram of 125 patients(M89, F36) underwent ASO for TGA at Seoul National University Children's Hospital from July, 1987 to June, 1997. To evaluate for associated factors, we divided patients of TGA to four hemodynamic groups(Group , simple TGA(n = 53) ; Group , associated with ventricular septal defect(VSD)(n = 50) ; Group , associated with VSD and PS(n = 18) ; Group , associated with PS(n = 4)). Grade of AI was assessed by color Doppler analysis(Perry's et al).

Results : Total prevalence rate of AI was 35.2%(31/88) and grade of AI were mild in 61%, moderate in 39%. The incidence of AI in each group was : Group 25.0%(10/40), Group 26.0%(9/36), Group 92.0%(12/13). According to this study, pulmonary stenosis was the only significant factor to AI. During follow-up(39 ± 24 Months), in spite of the normal left ventricular function in most patients with AI, a few patients(3 cases) suffered from progressive AI and some moderate AI patients(2 cases) showed slightly decreased LV function. Two moderate and progressive AI losted.

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Conclusion : In this study, AI(after ASO) was not uncommon and pulmonary stenosis was an important factor to AI. In some cases, AI became worse and developed decreased LV function. This suggests that meticulous follow-up after ASO is necessary.

KEY WORDS : Arterial switch operation · Aortic insufficiency.

서론

(Fig. 1).

가

(fractional shortening)

1975 Jatene ¹⁾

가

가

statistical analysis

system ANOVA Turkey's

Studentized Range Test

2-6).

1986

1987

결 과

1. 환자의 수술시 연령 (Table 1)

I 53 (42.4%) 2

7 (26.3), II 50 (40.0%)

4 56 (4.3), III

18 (14.4%) 38

60 (12), IV 4 (3.2%)

3 3 (1.2)

2. 각군에서의 대동맥판 폐쇄부전 (Table 2)

88 AI

88 31 (35.2%)

AI가 , 가 19 (61%)

Table 1. Hemodynamic groups of TGA and Age at operation

Group	No(%)	Age at operation median(range)
. simple TGA	53(42.4)	26.3D(2D - 7M)
. TGA+VSD	50(40.0)	4.3M(4D - 56M)
. TGA+VSD+PS	18(14.4)	12M(38D - 60M)
. TGA+PS	4(3.2)	1.2M(3D - 3M)

Table 2. Aortic insufficiency in each group

Group	No	Mild	Moderate	Total(%)
	40	7	3(2)*	10(25)
	35	6	3	9(26)
	13	6	6	12(92)
Total(%)	88	19(61)	12(39)	31(35.2)

(2)* : late death

대상 및 방법

1987 7 1997 6

가 가 125 (89 ,

36)

4 (I : (TGA), II

: TGA + (VSD), III : TGA + VSD

+ (PS), IV : TGA + PS)

가

가

가

Doppler Perry ⁷⁾

, 25%

12 (39%) . I 40 10
(25%) AI가 AI 7 ,
AI 3 , II 35 9
(26%) AI가 AI 6 ,
3 , III 13 12
(92%) AI가 AI 6 ,
6 . IV 4
I II AI
가 (P=0.94) I, II III
AI 가 (p<0.01)

3. 수술시 연령과 대동맥판 폐쇄부전 (Table 3)

I II AI가
I AI가
19.2 (2 2) AI
가 33.5 (5 7
) (P=0.36). II
AI가 2.8 (4
13) AI가 11.2
(30 56)
(P=0.16)

4. 대혈관 크기차이와 대동맥판 폐쇄부전 (Table 4)

I 1.62 ± 1.60
mm II 4.52 ± 3.21mm 가
(p>0.01), AI 25% 26%
AI

5. III군에서 폐동맥협착의 유형과 대동맥판 폐쇄부전 (Table 5)

III 18 6 (AI
3) 2
가 AI 1
12
11 1 10
AI가 AI 5
가 (subpulmonic
membrane), (ridge), (septal
deviation) 5

Table 3. Age at operation in AI(-) vs AI(+) in Group II
Mean(Range)

Group	AI(-)	AI(+)	P
I	19.2D(2D- 2M)	33.5D(5D- 7M)	0.36
II	2.8M(4D-13M)	11.2M(30D-56M)	0.16

Table 4. Relation of size discrepancy of aorta and pulmonary artery with prevalence of AI in Group I, II

Group	D(PA-Ao)(mm)	Prevalence of AI(%)
I	1.62 ± 1.60	25
II	4.52 ± 3.21	26

*p<0.001 (I vs II)

D(PA-Ao) : size discrepancy of aorta and pulmonary artery

Table 5. Relation of pulmonary stenosis and aortic insufficiency in Group III

PS type	No. of Cases	No. of survival	AI
Valvar	6	2	2
(bicuspid PV)	(3)	(1)	(1)
Subvalvar	12	11	10
Total	18	13	12

PV : pulmonary valve

Table 6. Pulmonary artery banding and aortic insufficiency

Group	No	AI
I	6(1)*	2
II	2(1)**	1
Total	8(2)*	3

*S/P) Senning **Death : 1

(infundibular hypertrophy)

6. 폐동맥 밴딩과 대동맥판 폐쇄부전 (Table 6)

8 (I 6 , II 2)
2 , 1
5 3 (60%) AI가 2
Senning I
II 1

7. 대동맥판 폐쇄부전의 진행성 (Fig. 2 - , ,)

AI (grade)가

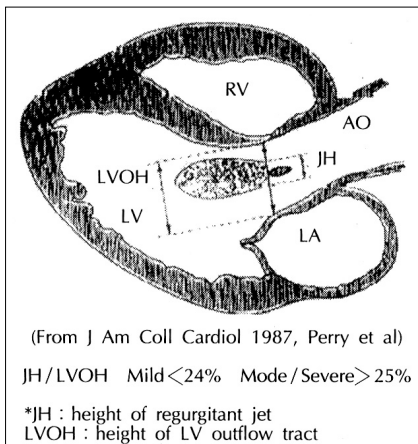


Fig. 1. Color Doppler analysis of severity of AI.

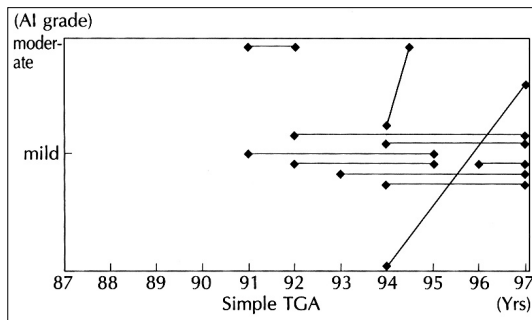


Fig. 2-I. Progression of AI in Group I.

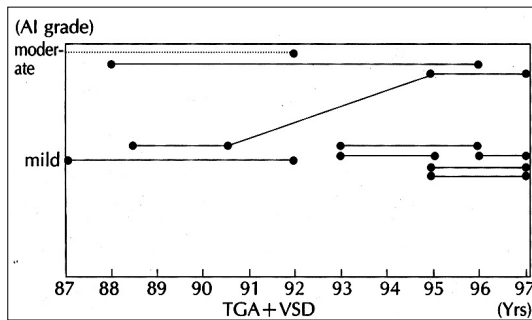


Fig. 2-II. Progression of AI in Group II.

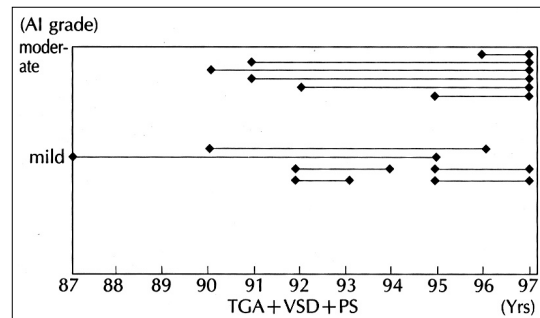


Fig. 2-III. Progression of AI in Group III.

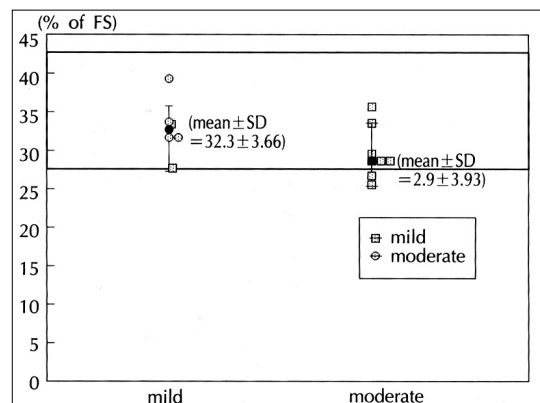


Fig. 3. Fractional shortening of LV with AI.

, II AI

8. 대동맥판 폐쇄부전 환자의 임상경과 (Fig. 3)

AI가 39 (: 2 107)

58 (2 12 4)

가 6 (7 35)

(FS) AI

32%, AI

29% .

AI 2 가 (FS)

25% 26%

AI

3

2 가 6 15

2 , II 1) AI

1 5 ,

가 1 . I

AI

(pul -

monary cusp)

6 가 , 가
 가 AI가 Doppler 가^{14,15)} Radio -
 , 1 AI graphic angiography stroke volume index
 가 가¹⁶⁾
 . Perry⁷⁾

고 안 24%
 , 25%
 1975 Jatene¹⁾ 가 61%, 39%
 .

가 ,
 ,
 ,
 가 ,
 가 2,3). thickening ,
 1986 가 4 - 6,8,9).
 ,
 가
 가 (surgically remediable)
 4 - 6).
 ,
 (fibrous ridge), (th -
 ickening of infundibular septum),
 9,17).
 ,
 2 - 6).
 17).
 가
 .
 1987 1997 I () 25%, II () 26% III () 92% I II
 , 가 I,II III 가
 가 Wernovsky¹²⁾ 41% AI
 .
 7% 41% ,
 가
 2 - 6,8 - 14). 1987 1997 가 가
 AI 가
 가 AI
 31
 35.2% . AI 가

4 4 . 3 (2 6) 가
 III 18 3
 가
 (fractional shortening)
 6 , 12
 6 3
 13 (6 2 , 32%, 29%
 12 11) 12 (2
 2 10)
 92% 25% 27%
 가
 2,10)
 58 (2 12 4)
 ,
 가 2 가
 AI 가
 8 1 6 , II
 2 2 Senning 가가
 1 1
 6 5 3 요 약
 가 연구배경 :
 Yasui ¹³⁾ button 가
 Valsalva
 36% 8%
 가
 방 법 :
 1987 7 1997 6
 가
 , 가 가 가 125 (89, 36)
 가
 I 10 , II
 9 , III 12 34 (2 107
) 6 Doppler Perry Color
 24%

, 25%

결 과 :

88
31 (35.2%) AI가 가19
(61%), 12 (39%)
AI 1 25%(10/40), 2 26%(9/35), 3 92%
(12/13)

AI

결 론 :

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