

Amplatzer Septal Occluder를 이용한 이차공 심방 중격 결손증의 폐쇄

가¹,²³
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Transcatheter Closure of Atrial Septal Defect Using Amplatzer Septal Occluder

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ABSTRACT

Background and Objectives : Transcatheter occlusion (TCO) may be an alternative method for the surgical closure of a secundum atrial septal defect (ASD) below 20 mm in diameter. We performed this study in order to evaluate the safety and feasibility of an Amplatzer septal occluder for closing ASD bigger than 20 mm in diameter percutaneously. **Subjects and Methods** : Thirty three of 39 patients presenting with ASD were included in this study (3 patients with a large defect over 32mm and 3 with multiple defects were excluded). The median age was 8.6 years (2.2 -54) and median weight was 27 kg (10.7 -85). The mean defect size was 15 ±3 mm as measured by transthoracic echocardiogram, 17 ±5 mm by transesophageal echocardiogram, and 21 ±6 (11 -32) mm by balloon stretched diameter. The balloon stretched diameter was larger than 20 mm in 20 of 33 patients. The mean Qp/Qs was 2.3 ±0.7. The mean device size was 22 ±6 mm and the mean fluoroscopic time was 13 ±7 min. **Results** : The device was successfully implanted in 29 of 33 patients. The 4 patients in which implantation failed showed a left disc protrusion into the right atrium. Three of these patients were treated surgically, and one underwent a successful second attempt of TCO 12 months after the first trial. Complete closure was obtained in 30 patients in follow-up. The complications encountered included ; cobra-shaped deformity of the device (3), transient AV block (Wenckebach) (1), embolization of the radioopaque marker into the left atrial appendage (1), failure in the first device (1), and mild mitral regurgitation at 3 months follow-up due to device protrusion into the mitral valve (1). **Conclusion** : The Amplatzer septal occluder appears to be a promising device for TCO of ASD up to 32 mm in diameter, however, long-term follow-up in a large number of patients is warranted. (**Korean Circulation J 2002;32(1):17-24**)

KEY WORDS : Heart septal defects, atrial ; Transcatheter closure ; Amplatzer septal occluder.

: 2001 8 23
 : 2001 10 9
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서 론

(Atrial Septal Defects, ASD)

가
(Qp/Qs) 2.3 ± 0.7 (Table 1).

방 법

1976 King¹⁾
가

Four chamber view

, 5 Fr. Right Judkins

0.035 Rosen wire(Cook Inc.,

가

가

Bloomington, IN)

sizing balloon

(Boston Scientific, Water-

town, MA) wire

(20 34 mm)

2

가

가 가

가 20 mm

가 sizing balloon

가 20 mm

Amplatzer

balloon stretched diam-

septal occluder(AGA medical Corp, Golden Valley, Minnesota) 32 mm

eter(BSD)

BSD 1 2 mm

ASO

del-

ivery wire

sheath

. ASO

7 10 Fr. long

sheath

sh-

eath dilator wire

sheath

. ASO가

sheath

long sheath

ASO

. ASO

sheath

left

대상 및 방법

대 상

1998 12 2001 2 가

39 33

Amplatzer septal occluder(ASO)

가

가 10

가 23

2.2 54

(8.6) . 10.7 kg 85 kg

(27 kg) .

15 ± 3 mm,

17 ± 5 mm, balloon stretched diameter 21 ± 6

mm(11 32) , 39

가 32 34 mm

3

(multiple defects)

3

. 33

32

Table 1. Clinical data of patients

Number	33
Male : Female	10 : 23
Median age (years)	8.6 (2.2 - 54)
Median weight (kg)	27 (10.7 - 85)
Defect size	
Transthoracic echocardiogram	15 ± 3 mm
Transesophageal echocardiogram	17 ± 5 mm
Balloon stretched diameter	21 ± 6 mm
Qp/Qs	2.3 ± 0.7

atrial disc ASO waist ri -
 ght atrial disc radioopaque marker sheath
 sheath ASO 가 sh -
 eath right atrial disc wire
 disc가 ASO가
 , , ,
 wire ASO wire
 100 IU/kg ASO
 20 IU/kg/hr
 24
 5 mg/kg X -
 6 ASO
 2
 1 1
 X - 3 12

Table 2. Implantation data

Device size (mm)	22 ± 6
General anesthesia	32/33
Fluoroscopic time (min)	13 ± 7
Successful implantation	29/33 (88%)

Table 3. Complications

Cobra-shaped deformity of device	3
Transient AV block	1
Embolization of marker	1
Fail in first device (22-26 mm)	1
Mild MR at 3 months F/U	1

AV : atrioventricular, MR : mitral regurgitation

ASO 가 26 mm 가 3
 , 가
 1

(Table 3).

고 찰

결 과

가
 33 29 (88%),
 20 가 20 mm
 ASO 22 ± 6 mm fluo -
 roscopic time 13 ± 7 (Table 2). 4
 disc
 가 , 1 1
 3 . 30
 7 3
 ASO (cobra shaped de -
 formity)

Wenckebach type 가 20 mm
 1 , long sheath radioopaque marker
 (embolization) 1 septal margin (5 mm)
 Amplatzer snare . 1 22 mm 7)

2)

. 1953 Rubio

, , , 2.5% 13%
 3) 가 4)
 7.8% 16.7% 5)6)

1976 King¹⁾ tissue가

1980 Lock⁷⁾ double - umbrella 가 (centering)

Clamshell ASD occlusion device(USCI, Bard, Boston, Massachusetts) , 1989 FDA sheath 12Fr. 13Fr. (Food and Drug Administration) Investigational Device Exemption(IDE) Bard clamshell device 25 mm 가 . Rickers¹⁵⁾ 105 Das Angel Wings device 96%(72) 27%(20) , 3 가 20 mm , reposition 가

가 20 mm (arm) ASDOS nitinol wire polyurethane umbrella gu - ide wire loop device가 disc가 central hub , Hausdorf¹⁶⁾ 86%, Wings device⁹⁾(Microvena corp, White - Bear Lake, Minn), Atrial septal defect occluder system(ASDOS)¹⁰⁾(Osypka Corp, Rheinfelden, Germany), Amplatzer device¹¹⁾ (AGA medical Corp, Golden Valley, Minn) . FDA 90% , 6 42% . Ho - epp¹⁷⁾ ASDOS 20 5 (25%) wire , 8 (40%) ASDOS 가 1999 FDA Clamshell device CardioSeal septal occluder(Nitinol Medical Technologly Inc, Boston, Mass) 가 , 45% nit - 2001 ASO inol wire polyester fabric mesh Sharafudin¹⁸⁾ , device 가 , 26% 33% umbrella가 unfold recap - turing repositioning 가 ,¹²⁾ 1990 가 . Clamshell, Sideris bu - Sideris buttoned device unbuttoning ttoned device, ASDOS 2 2.5 7% , 가 repositioning 가 Amplatzer device 1.5 가 20 mm Das¹⁴⁾ Angel Wings device .¹¹⁾ Berger¹⁹⁾ 3 superelastic nitinol wire polyester

98% , eed ²⁶⁾ .
1.9% ,
(3 days Rickers ¹⁵⁾ An -
vs 8 days) (5/61 vs gel Wings device 가
12/61) Amplatzer device 가 (fossa ovalis) (coronary
Chan ²⁰⁾ 100 , 가 4 mm
Amplatzer device 7 (paradoxical septal motion)
1 (Qp : Qs)가
3 99% 1.5 : 1 , (paradoxical em -
가 , Dhillon ²¹⁾ bolism), (embolic stroke),
Chan ²⁰⁾ . (transient focal neurologic deficit),
가 Formigari ²²⁾ Si - (peripheral arterial embolism)
deris buttoned device, Angel Wings device, Ampl -
atzer device 3 Am - (migraine)
platzer ,
, Walsh ²³⁾ Sideris buttoned , fenestrated
device Amplatzer device .
Amplatzer (83% vs 44%)
2 , fluoroscopic time (13.4 min ,
vs 23.7 min) . Amplatzer device ,
가 device ,
가 ,
Amplatzer device ,
, Amplatzer device 가 10 kg . Berger ¹⁹⁾ Ampla -
disc (skirt) device tzer device ,
, 5 mm , 가
(endothelialization) .
¹⁸⁾²³⁾ Amplatzer device ,
(bulky shape) , Acar
²⁴⁾ device가 가
가 Amplatzer 9.2 cm³, Ca -
rdioSeal occluder 3.5 cm³ ,
가 ,
²⁰⁾ nitinol wire (nickel)²⁵⁾ 가
balloon stretched diame -
30 ter
가 7 Amplatzer septal device Berger ¹⁹⁾
. Ta - 7 mm 26 mm(13 mm), Acar ²⁴⁾

Table 4. Comparisons with reported data (ASD closure using Amplatzer septal occluder)

	Success	Defect size (BSD) (mm)	Fluoroscopic time (min)
Taeed et al (1998) ²⁹⁾	16/18	13.2 ± 1.4 (5-22)	22.5 (13.3-34.6)
Walsh et al (1999) ²²⁾	37/39	15 (7-26)	13.4 (8-41)
Dhilon et al (1999) ¹⁶⁾	20/20	20 (13-28)	15.2 (8.4-24.7)
Berger et al (1999) ¹⁴⁾	61/108*	14 (7-26)	7.3 (0-20.3)
Chan et al (1999) ¹⁵⁾	94/101†	14 (4-26)	16 ± 8 (6-49)
Jo & Kim et al (2001)	29/33	21 ± 6 (11-32)	13 ± 7 (7-42)

ASD : atrial septal defect, BSD : balloon stretched diameter, PFO : patent foramen ovale, * : unselected patients, † : patients with ASD (87), PFO (7), fenestrated fontan (7)

12 mm 25 mm(18 mm), Taeed ²⁶⁾ 5
mm 22 mm(13 mm), Angel Wings device
Rickers ¹⁵⁾ 10 mm 20 mm(
13 mm, 17 mm)
가 21 mm, 32 mm

요 약

배경 및 목적 :

(Table 4).

가

가

가 20 mm

Amplatzer septal occluder

20

mm

방 법 :

1998 12 2001 2 가

가 25 ± 6 mm

ASDOS Sideris buttoned device 가

Amplatzer device 가

²⁸⁾²⁹⁾ Amplatzer device 가

. Amplatzer device

가 39 33 Am -
platzer septal occluder

가 가 10 가 23

2.2 54 (

8.6) , 10.7 kg 85 kg (

27 kg) . 15 ±

3 mm, 17 ± 5 mm, Balloon stret-

ched diameter 21 ± 6 mm

(Qp/Qs) 2.3 ± 0.7 .

결 과 :

가 가

가 39 가

32 34 mm 3

(multiple defects) 3

가 . 33 32

4 disc가

26 mm sheath marker, 22 mm device, 29 mm Amplatzer septal occluder

중심 단어 : ; ; Amp-latzer septal occluder.

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