

심방중격결손 환자에서 하부 사지유도 심전도의 R파 절흔(Crochetage)의 의의

이현국 · 배우형 · 박용현 · 박용인 · 김성호 · 안병재 · 전국진 · 홍택중 · 신영우

The Significance of a Crochetage Pattern on R Wave in Electrocardiographic Inferior Limb Leads in Atrial Septal Defect

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ABSTRACT

Background and Objectives : The patients with atrial septal defect generally have no symptoms in the childhood, and have nonspecific symptoms such as dyspnea on exertion, fatigue, and palpitation even in the late period of adult. Thus delayed diagnosis for whom surgical correction was undoubtedly needed remains to be resolved. Accordingly, the simple and noninvasive method such as electrocardiography in patients with atrial septal defect having the nonspecific symptoms or having no symptoms warrants to be developed. This study was performed to see whether the crochetage pattern on R wave in inferior limb leads is effective for the electrocardiographic diagnosis of atrial septal defect and relates to the magnitude of left to right shunt. **Methods :** Our subjects were 129 patients diagnosed as the atrial septal defect by the echocardiography and cardiac catheterization from January 1992 to June 1998. We selected 57 persons, as control group, who showed the normal findings under the echocardiography and also showed the incomplete right bundle branch block on the electrocardiography. We compared the frequency of the crochetage pattern in inferior limb leads between the two groups. Also we compared the frequency of the crochetage pattern before operation and after operation according to the quantity of the left to right shunt in the operated 40 patients with atrial septal defect. **Results :** 1) The crochetage pattern was observed in 61.2% in patients with atrial septal defect and its frequency was greater than that of the control group (38.6%, $p = 0.005$). 2) The crochetage pattern was disappeared by the operation in 16/29 patients (55.2%, $p = 0.001$). 3) The frequency of disappearance of the crochetage pattern after operation differed significantly according to shunt severity : 72.2% for a Qp/Qs ≥ 3.0 group, 18.2% for a Qp/Qs < 3.0 group ($p = 0.015$). **Conclusion :** The crochetage pattern on R wave in inferior limb leads was helpful to the electrocardiographic diagnosis of the atrial septal defect. The disappearance of the crochetage pattern after operation was correlated with shunt severity. (Korean Circulation J 1999;29(8):796-801)

KEY WORDS : Crochetage pattern · Electrocardiography · Atrial septal defect.

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서 론

가 , 가 . , 1-3) . 1)4-7) 가 . 가 . 가 . 2.9 5% 1)8-11)18)19)27) R 가 , 1959 11 crochetage R 12) cro - chetage , 129 93 (72.1%) , crochetage 13 (10.1 %), 23 (17.8%), 43 (33.3%) crochetage 79 (61.2%) . 129 57 37.2 17 (29.8%), 4 ±15.0(15 76) 48 , 81 (7.0%), 1 (1.8%) 1 : 1.7 . crochetage 22 (38.6%) . 1997 1 crochetage

대상 및 방법

1992 1 1998 6 129 57 37.2 17 (29.8%), 4 ±15.0(15 76) 48 , 81 (7.0%), 1 (1.8%) 1 : 1.7 . crochetage 22 (38.6%) . 1997 1 crochetage

1998 6 57 39±18.2(12 80) , 1 : 1.5 23 , 34 . 129 40 15 QRS 80 120 ms V1 V2 r' R'가 V2 R peak time 50 ms 14) R cro - chetage , , aVF R 가 - (up and down) R 가 M 20) . chi - square test , McNemar test , Q_P/Q_S(pulm - onary/systemic blood flow ratio)가 3.0

chi - square test , p<0.05

결 과

129 93 (72.1%) , crochetage 13 (10.1 %), 23 (17.8%), 43 (33.3%) crochetage 79 (61.2%) . 129 57 37.2 17 (29.8%), 4 ±15.0(15 76) 48 , 81 (7.0%), 1 (1.8%) 1 : 1.7 . crochetage 22 (38.6%) . 1997 1 crochetage

Table 1. Frequency of the crochetage pattern in inferior limb leads in patients with atrial septal defect and control group

Group	Crochetage pattern in inferior limb leads				
	Absence, n	Presence, n			
		1 lead	2 leads	3 leads	Total*
ASD patients (n=129)	50 (38.8%)	13 (10.1%)	23 (17.8%)	43 (33.3%)	79 (61.2%)
Control group (n=57)	35 (61.4%)	17 (29.8%)	4 (7.0%)	1 (1.8%)	22 (38.6%)

*p value=0.005

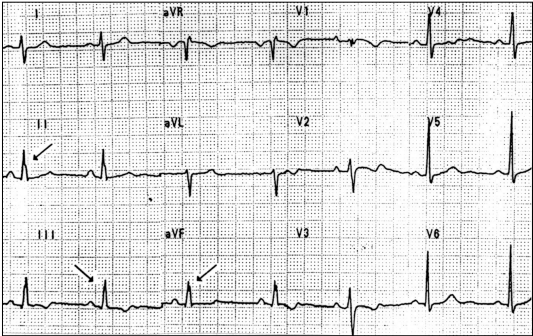


Fig. 1. Example of ECG tracings with the crochetage pattern in inferior limb leads I, II, III, aVR, aVL, and aVF in patient with atrial septal defect. Note the notches (arrows) on the R wave (rapid up-and-down motion of the R wave tracing on its ascendant branch or nearapex).

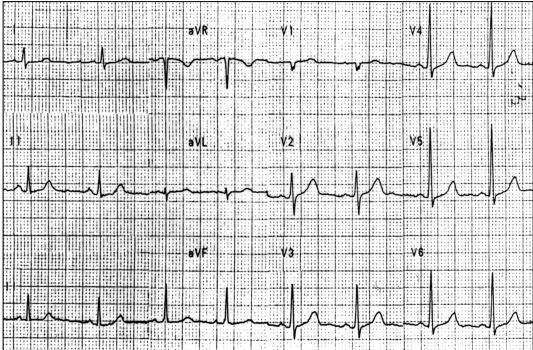


Fig. 2. ECG finding after operation of the same patient of the Fig. 1. Note the disappearance of the notches on R wave in inferior limb leads.

Table 2. Number of patients with the crochetage pattern in inferior limb leads according to the magnitude of the Left to right shunt in 40 patients with atrial septal defect

ECG	Qp/Qs 3.0 (n=21)		Qp/Qs<3.0 (n=19)	
	A*	B†	A*	B†
1 lead	2	0 (0%)	2	0 (0%)
2 lead	3	2 (66.7%)	3	0 (0%)
3 lead	13	11 (84.6%)	6	3 (50.0%)
Total‡	18	13 (72.2%)	11	2 (18.2%)

* A : presence of notch before operation

† B : disappearance of notch in one lead at least after operation

‡ p value=0.015

(55.2%)

crochetage (p = 0.001)(Figs. 1 and 2).

Qp/Qs

40
Qp/Qs 1.5 38 (95%), Qp/Qs <1.5
2 (5%) 1.5 1.5
Qp/Qs >1.5
Qp/Qs 3.0
21 (52.5%), Qp/Qs<3.0 19
(47.5%), Qp/Qs>1.5 3.0
crochetage 18 (85.7%)
18 13
(72.2%) 3.0 crochetage
11 (57.9%) 11
2 (18.2%)

Qp/Qs>1.5 3.0

crochetage 85.7% 57.9%
가 (p = 0.2)
3.0 72.2% 3.0 18.

(p=0.005),
crochetage
가 (p=0.001)(Table
1). 129 40
crochetage
29 (72.5%)
16/29

2% (p=0.015)(Table 2).

고 안
, 1 10
40 가 4%
1)
1)4)6)
1959
R
M
crochetage
11)27) 1996 Heller
crochetage
73.1%, 92.6%
crochetage
가 100% 가
cro -
20 1% chetage 1
, 50 가 75%, 60 가 90% 61.2%
2) Murphy 41 가 38.6% (p=0.005).
3)
가
Qp/Qs가 1.5 45
31)
crochetage
36% 9%
6 1
31)
1)3)13)15)
crochetage
1)17)20)
QRS 80 ms
QRS
1)8-11)
가 40

20) , croche - tage

Q_P/Q_S 가 3.0 , Q_P/Q_S 3.0 85.7% , $Q_P/Q_S < 3.0$ 57.9% crochetage

3.0 72.2%, 3.0 18.2% 가 crochetage (p=0.015).

crochetage 가 ,

crochetage

요 약

서 론 :

대상 및 방법 :

1992 1 1998 6

129

57

129 40

결 과 :

1) (61.2% vs 38.6%, p=0.005).

6%, p=0.005).

2) 40

29 (63%) ,

16 (55.2%)

(p=0.001).

3) 40

Q_P/Q_S 가 3.0 72.2% , Q_P/Q_S 가 3.0 18.2%

(p=0.015).

결 론 :

R crochetage

crochetage

중심 단어 : Crochetage

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