

장기간의 대동맥 협착으로 유발된 비후심장근 내측부의 허혈성 괴사

김성숙 · 한동선* · 박이태**

= Abstract =

Subendocardial Ischemic Necrosis in Hypertrophied Rabbit Heart Induced by Chronic Aortic Constriction

Sung Sook Kim, M.D., Dong-Sun Han, M.D.,* Je Tae Park, M.D.**

Department of Pathology, Ulsan University Hospital, Ulsan, Korea

Department of Cardiology, Pohang Christian Hospital, Pohang, Korea*

*Department of Thoracic Surgery,** Dan Kook University Hospital, Seoul, Korea*

Background : Cardiac hypertrophy is the compensatory response of the myocardium to increased workload. Compensatory mechanisms come into play when the hypertrophied heart can no longer accommodate the increased demand or persistent stimuli. Although it has been reported that the molecular changes in hypertrophied hearts that initially mediate enhanced function may contribute to the development of heart failure, the structural/biochemical/molecular basis for myocardial contractile failure is still obscure. This study was aimed to clarify the structural basis for relation between hypertrophy and failure.

Method : Nine pairs of rabbits were sacrificed at 8, 12, 24, 48 hours and 1, 2, 4, 6, 8 weeks after experimental aortic constriction. Their hearts were studied with routine histopathology. Each heart was weighed and compared with total body weight. Multiple sections were embedded in paraffin, sectioned at 5 μ m, and stained with hematoxylin and eosin and Masson's trichrome and analysed.

Results : The heart weight to body weight ratio(g/Kg) increased progressively with time after aortic banding. Banding of the aorta in the rabbit resulted in multifocal areas of myofiber degeneration, necrosis and fibrosis through the wall of the left ventricle, in the papillary muscles of the left ventricle and in the left ventricular portions of the interventricular septum in rabbit of 6 and 8 weeks after aortic banding. By 4 weeks after banding, the foci of necrosis were not observed.

Conclusion : These findings suggest that the increased necrosis, fibrosis in animals with cardiac hypertrophy induced by banding the aorta may play a role in progression to heart failure.

KEY WORDS : Cardiac hypertrophy · Ischemic necrosis · Heart failure.

4 , 가 (Masson's trichrome)
 0 , 가 (reticulin hrome)
 1 , 2 , 3 , 4

가 (Fig. 2).
 가 (contraction band ne-
 crosis)가 8 가 (Fig. 3)
 가 (Fig. 4).

결 과

1. 심근 비후의 정도

Table 1

가 가

2. 병리조직학적 검색

1) 심근괴사

2 , 4
 6 , 8
 가 가

Table 2

6 가 (Fig. 1) 8 가

Table 1. Heart weight/body weight(g/kg) and measurement of heart size(cm)

	HW/BW(g/kg)	Thickness of LV(cm)	Diameter of heart(cm)
Control	2.1	0.3	2.7
8 hours	2.2	0.4	2.7
12 hours	2.1	0.4	2.8
24 hours	2.4	0.7	2.9
48 hours	2.3	0.6	2.9
1 week	2.9	1.1	3.2
2 weeks	2.9	1.1	3.2
4 weeks	2.8	1.0	3.0
6 weeks	3.3	1.2	3.8
8 weeks	3.4	1.2	4.0

Table 2. Degree of necrosis, fibrosis

Histology\weeks	1	2	4	6	8
Grade of necrosis	0	0	0.5	3	3.5
Grade of fibrosis	0	0	0.5	2.5	3

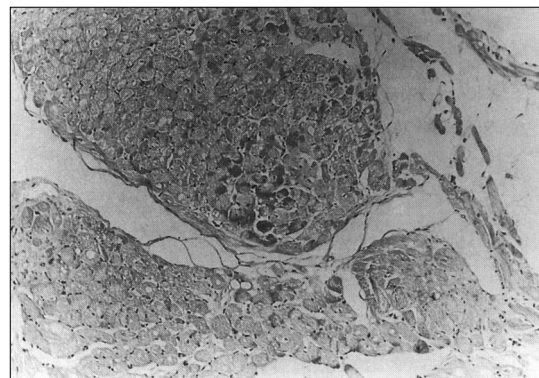


Fig. 1. Microscopic view of hypertrophic heart produced by 6 weeks' banding ; Moderate degree of focal coagulation necrosis is evident in the subendocardial side of myocardium(H & E, × 100).

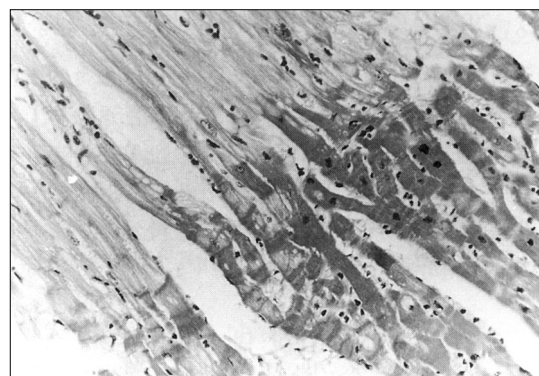


Fig. 2. Severe degree of diffuse coagulation necrosis in hypertrophic heart produced by 8 weeks' aortic banding(H & E, × 100).

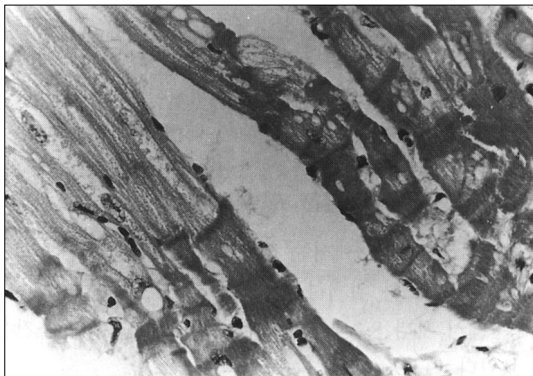


Fig. 3. Higher magnification of Fig.2 showing cytoplasmic hypereosinophilia with nuclear pyknosis and some areas of contraction band necrosis(H & E, $\times 200$).

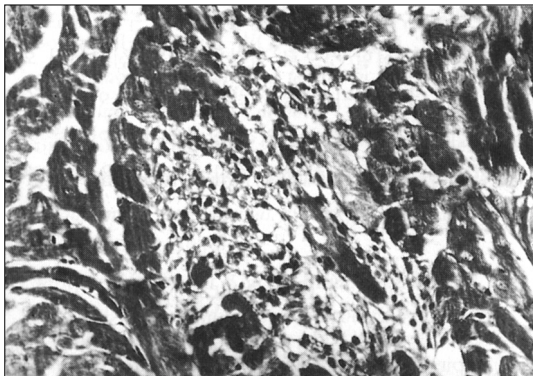


Fig. 4. Increased fibrosis and mild inflammatory cells infiltration in the area of necrosis are observed in hypertrophic heart produced by 8 weeks' aortic banding(H & E, $\times 200$).

2) 섬유화

6 8 가

고 안

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1,9,10)

가

aorta

apoptosis

가

17).

가
Opie 23)

가

가가

24)

protein kinase

가 25,26).

15,27).

가

11 - 13).

가

가

16,17).

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가

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18 - 22).

c -

fos c - myc
18 - 20).

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RNA

가,

가,

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14).

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9,10,16).

가

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group

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방 법 :
4 , 6 , 8

가

1

가 6 adenylyl

cyclase 가 28)

결 과 :
1 , 2 , 4
6 , 8

4

apoptosis 가 29,30)

apoptosis 가 necrosis가 apopto -

sis 가

가

6 8 가

결 론 :

가

6 가 8 가 가

가

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요 약

연구배경 :

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