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Case of ruptured aneurysm of the aortic arch into the main pulmonary artery

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Introduction: Thoracic aortic aneurysms are usually asymptomatic, but once aneurysms become symptomatic or painful, thoracic aortic aneurysms are lethal. Aortic rupture occurs with the incidence of 3.5/100,000 patient-years approximately. One study found that only 41% of patients with thoracic aortic aneurysm rupture reach a hospital alive. This report demonstrates a rare case of the ruptured aortic arch aneurysm into the main pulmonary artery. **Case Report:** The patient was a 73-year-old male who had a previous 3.5cm abdominal aortic aneurysm and a brain aneurysm that was under observation. He was referred to our emergency department because of dyspnea, epigastric pain, and chest discomfort. The initial impression was pneumonia and the chest X-ray showed total haziness in the right lung. In the emergency room, he suddenly showed an altered mental status and decreased blood pressure. Transthoracic echocardiography showed near normal LV systolic function and severe RV dysfunction and unenhanced computed tomography showed an 8cm sized saccular aneurysm in the aortic arch with no evidence of pulmonary artery thromboembolism. He suffered recurrent cardiac arrest and was re-suscitated with E-CPR. Despite the ECMO insertion, blood pressure was not maintained and pulse pressure was lost. We performed a transesophageal echo-cardiography to find the cause of hypotension and cardiac arrest; it revealed that the aortic arch aneurysm rupture communicated with the main pulmonary artery that was causing severe RV dysfunction. Unfortunately, he died of ischemic brain injury. **Conclusion:** Rupture of the aortic arch aneurysm into the main pulmonary artery is rare and difficult to diagnose with usual imaging tests. In this case, transesophageal echocardiography was very helpful in con-firming the presence and precise location of the aneurysm rupture.

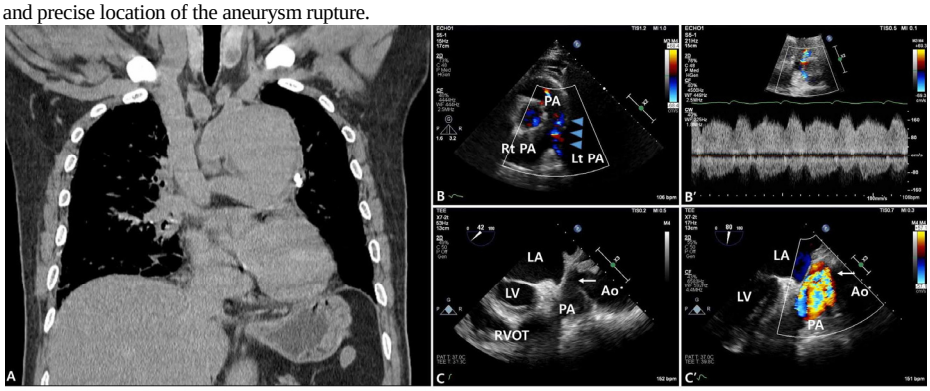

Fig.1.A)Unenhanced computed tomography B)Transthoracic echocardiography C)Transesophageal echocardiography

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한국인 코호트연구를 통한 맥박압과 심혈관질환의 연관성

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목적: 본 연구자들은 한국인 코호트 인원을 대상으로 최초 내원시 맥박압(pulse pressure)과 심혈관질환의 연관성을 살펴보는 연구를 시행하였다. **대상 및 방법:** 본 연구에서는 Korean Health and Genome Study (KHGS) 자료를 분석하였다. 혈압은 총 7,981명(남성 3,906, 여성 4,075)을 대상으로 측정하였다. 혈압은 30분 이상 간격으로 세차례 측정한 혈압측정치의 평균치를 바탕으로 분석하였다. 맥박압은 수축기혈압에서 이완기혈압을 뺀 값으로 계산하였다, 심혈관질환 발생은 2001년부터 2012년까지 관찰하면서 발생한 경우로 정의하였다. **결과:** 9.8년의 추적관찰 기간에, 541명에서 심혈관질환이 발생하였다(관상동맥질환 337명, 뇌졸중 217명). 맥박압을 4분위로 나누어서 분석한 결과, 맥박압이 증가할수록 심혈관질환 발생이 증가하였다. 특히 맥박압이 가장 높은 환자군(47 이상)이 낮은 환자군(34 미만)에 비해서 심혈관질환 발생이 많았다. 맥박압이 가장 높은 환자군의 보정된 위험비(adjusted hazard ratio)는 통계학적으로 유의하게 높았다(HR 1.399, 95% CI 1.055-1.856, p<0.05) **결론:** 본 연구결과 높은 맥박압은 심혈관질환 발생과 유의한 상관관계를 보였다.

Table 1. Baseline characteristics of the study population

Characteristics (N = 7,981)	CVD (-), n = 7,440	CVD (+), n = 541	P value
Years of follow-up	9.77 ± 0.21	9.77 ± 0.21	0.790
Age, years	51.20 ± 8.66	57.40 ± 8.11	< 0.001
BMI (kg/m²)	24.37 ± 3.08	24.50 ± 3.20	0.340
Waist circumference (cm)	81.94 ± 8.63	84.66 ± 9.00	< 0.001
Fasting glucose (mg/dL)	88.07 ± 20.69	93.19 ± 28.74	< 0.001
HbA1c (%)	5.73 ± 0.85	6.11 ± 1.40	< 0.001
SBP (mm Hg)	115.09 ± 16.94	123.34 ± 17.35	< 0.001
DBP (mm Hg)	74.02 ± 11.18	77.32 ± 10.90	< 0.001
Pulse pressure	41.06 ± 10.31	46.05 ± 11.63	<0.001
TC (mg/dL)	192.10 ± 35.68	196.65 ± 36.37	0.004
TG (mg/dL)	154.50 ± 103.73	172.2 ± 102.09	< 0.001
HDL (mg/dL)	46.60 ± 10.90	45.26 ± 10.52	0.006
LDL-C (mg/dL)	117.85 ± 35.33	120.66 ± 34.14	0.074
HOMA-IR	1.65 ± 1.28	1.88 ± 1.80	< 0.001
Current smoker	1952 (26.3)	163 (30.2)	0.049
Exercise ≥3 days/week	1372 (18.4)	77 (14.2)	0.013

Values are expressed as mean±SD or number (%). CVD, cardiovascular disease; BMI, body mass index; HbA1c, glycated hemoglobin; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; TG, triglycerides; HDL-C, high density lipoprotein cholesterol; LDL-C, low density lipoprotein cholesterol; HOMA-IR, homeostasis model of assessment-insulin resistance.

Table 2. Risk of cardiovascular disease and death based on pulse pressure during follow-up.

N=7,981	pulse pressure quartile categories			
	<34	34-39	40-46	≥47
Number of subjects	1,748	2,175	2,072	1,986
CVD (n=541)	62 (3.5)	115 (5.3)	131 (6.3)	233 (11.7)
CHD (n=337)	41 (2.3)	74 (3.4)	74 (3.6)	148 (7.5)
Stroke (n=217)	21 (1.2)	42 (1.9)	63 (3.0)	91 (4.6)
CVD death (n=65)	8 (0.5)	9 (0.4)	18 (0.9)	30 (1.5)
Total death (n=359)	50 (2.9)	69 (3.2)	82 (4.0)	158 (8.0)
Adjusted hazard ratio				
Multivariate model 1				
CVD	1	1.431 (1.041-1.967)*	1.499 (1.095-2.051)*	2.099 (1.551-2.841)*
CHD	1	1.389 (0.942-2.049)	1.285 (0.869-1.900)	2.061 (1.424-2.984)*
Stroke	1	1.511 (0.890-2.568)	2.063 (1.247-3.413)*	2.171 (1.319-3.575)*
CVD death	1	0.798 (0.306-2.082)	1.320 (0.566-3.076)	1.352 (0.597-3.060)
Total death	1	1.005 (0.688-1.469)	1.025 (0.708-1.484)	1.352 (0.954-1.916)
Multivariate model 2				
CVD	1	1.396 (1.007-1.936)*	1.483 (1.073-2.048)*	1.968 (1.439-2.692)*
CHD	1	1.383 (0.925-2.069)	1.312 (0.875-1.967)	1.939 (1.316-2.856)*
Stroke	1	1.416 (0.829-2.421)	1.959 (1.177-3.261)*	2.031 (1.226-3.364)*
CVD death	1	0.891 (0.328-2.417)	1.258 (0.504-3.139)	1.274 (0.530-3.067)
Total death	1	0.998 (0.674-1.477)	0.991 (0.673-1.460)	1.281 (0.889-1.845)

Data are expressed as number of patients (%) or hazard ratio (95% confidence interval) of patients (%). CVD, cardiovascular disease; CHD, coronary heart disease. Model 1: adjusted for age and sex. Model 2: adjusted for age, sex, LDL-C, waist circumference and fasting plasma glucose. * p < 0.05