

## Central Hemodynamics in Pediatric Patients after Successful Aortic Arch Repair

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### Introduction

In patients after aortic arch repair, future hypertension is one of the most important problems. It is reported that the prevalence of hypertension increases with age. Recently, the importance of central blood pressure evaluation in the management of hypertension has been recognized. Therefore, we examined the central hemodynamics in patients after aortic arch repair.

### Methods

This study enrolled 20 patients aged under 15 year ( $7.7 \pm 3.3$  years old) with aortic coarctation (14) or interrupted aortic arch (6) after a successful aortic arch repair (i.e. no pressure gradient in aortic arch). The methods of aortic arch repair were extended to end-to-end anastomosis in 14, subclavian flap in 5 and Blalock-Park operation in 1. The period after aortic arch repair was  $7.6 \pm 3.3$  years. The patients diagnosed as hypertension judging from Japanese guideline were excluded. None of them were taking any medication and none were diagnosed to be suffering from Turner syndrome. The aortic pressure waveform was recorded using a pressure sensor mounted catheter, and central hemodynamical parameters were compared with those in normal aortic circulation patients.

### Results

There were no significant differences in age, height and body weight between the two groups. Central systolic blood pressure ( $100.4 \pm 10.1$  vs.  $90.5 \pm 10.7$  mmHg,  $p = 0.0013$ ) and pulse pressure ( $38.6 \pm 8.0$  vs.  $32.3 \pm 4.8$  mmHg,  $p = 0.0011$ ) were significantly high in patients after aortic arch repair. Augmentation index ( $25.9 \pm 14.2$  vs.  $6.0 \pm 16.5$  %,  $p < 0.0001$ ) and heart rate corrected augmentation index ( $30.4 \pm 14.6$  vs.  $13.4 \pm 19.1$  %,  $p = 0.0012$ ) were also high in the patients.

### Conclusions

Although the brachial blood pressure is not elevated, central hemodynamics demonstrated abnormal profile in patients after aortic arch repair even in childhood. One of the reasons of the elevated central aortic pressure is the enhanced aortic pressure wave reflection. It is important for close observation of these patients, although they do not demonstrate hypertension in childhood.