Rapid Aortic Enlargement Requiring Surgery in Patients with Chronic Type B Aortic Dissection

Mitsumasa Hata [1] Kenji Akiyama [1] Shinji Wakui [1] Ayako Takasaka [1] Motomi Shiono [1]

[1] Department of Cardiovascular Surgery, Nihon University, Nerima Hikarigaoka Hospital, Tokyo, Japan

Thorac Cardiovasc Surg 2012;60(S2):e31–e32.

Address for correspondence Mitsumasa Hata, M.D., Department of Cardiovascular Surgery, Nihon University, 30-1 Oyaguchi, Kamimachi, Itabashi-ku, Tokyo 173-8610, Japan (e-mail: hata.mitsumasa@nihon-u.ac.jp).

Abstract

We report the relationship between rapid aortic enlargement of chronic type B aortic dissection and sleep disorder due to anxiety after Tohoku disaster. Five patients underwent surgical procedures due to rapid aortic enlargement after the earthquake disaster. They reported that their morning blood pressure increased to approximately 190 mm Hg after the disaster. They were troubled with severe insomnia due to anxiety about the continuing aftershocks. In primary care for patients with mental stress after a big disaster, it is important to keep a careful monitoring of blood pressure besides assessment of anxiety and sleep.

Keywords
- aortic dissection
- sleep disorder
- Tohoku disaster

Introduction

In March 2011, an unprecedented and disastrous earthquake and tsunami hit the Tohoku area in Japan, killing almost 20,000 people. Since then, moderate to large earthquakes have occurred on a frequent basis, even close to Tokyo. We noticed that several patients suffered from rapid enlargement of the distal aortic arch after the earthquake disaster.

Case Presentation

Five patients with chronic type B aortic dissection (BAD) whose maximum aortic diameters were less than 50 mm before disaster underwent surgical procedures due to rapid enlargement of the distal aortic arch 1 to 2 months after the earthquake disaster. Institutional Review Board approval was obtained before publication of this manuscript and reporting of this information. The patients were all men and average age was 65.8 ± 7.5 years, ranging from 54 to 75 years old. The onsets of acute BAD in all patients were more than 5 years ago, and follow-up computed tomographic (CT) scans were performed every 6 months after onset. The maximum aortic diameters of patients ranged from 40 to 48 mm until December 2010 (►**Fig. 1**). Before the disaster, the mean value of the morning systolic blood pressures of patients at home had been maintained at a stable level of approximately 110 mm Hg for 5 years. However, all patients reported that their morning blood pressure increased to approximately 190 mm Hg in the period after the disaster. Refractory hypertension persisted in all patients despite taking additional antihypertensive medications for 1 month. All patients revealed that they were troubled with severe insomnia due to anxiety about the continuing aftershocks. All patients complained to wake up frequently all over the night and their sleep length was less than 2 hours due to anxiety. The refractory hypertension was lowered through antianxiety medication and sleep inducers. However, 1 month later, periodical CT scans for initial two patients showed rapid enlargement of the distal aortic arch to more than 50 mm; therefore, we recommended the other patients to receive follow-up CT assessment. Then, the CT scans revealed rapid aortic enlargement to more than 50 mm in all patients (►**Figs. 1** to **3**). All patients underwent surgical treatment approximately two months after the disaster. An entire aortic arch replacement with median sternotomy was performed on one patient, whereas distal arch and descending aortic replacement with lateral thoracotomy was performed on the other four patients. The postoperative course of all patients was uneventful.

Comments

Patients with BAD are initially treated using traditional medical methods.[1] Midterm survival of BAD patients should be more favorable by the aggressive hypotensive treatment

received
December 12, 2011
accepted after revision
April 10, 2012
published online
November 24, 2012

© 2012 Georg Thieme Verlag KG Stuttgart · New York

DOI http://dx.doi.org/10.1055/s-0032-1322610.
ISSN 2194-7635.

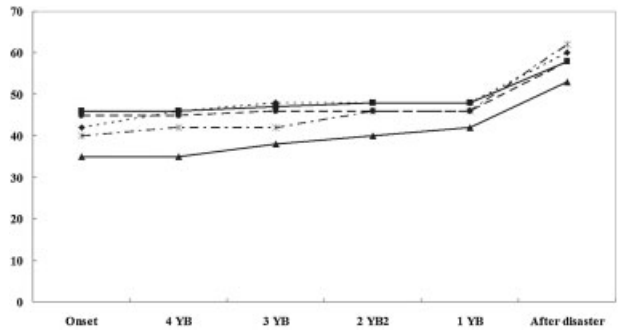

Figure 1 Chronological change of maximum aortic diameter. YB, year before disaster.

and close monitoring by cardiologist or cardiovascular surgeon.[1] When and how many patients require elective surgery for BAD? Several investigators suggest that a maximum aortic diameter exceeding 40 mm at the time of BAD onset is a significant predictor of elective surgery.[2] Our long-term outcomes show a satisfactory 10-year survival rate of 71.8% and 10-year freedom from surgery of 76.0% with aggressive hypotensive therapy and close monitoring.[1] Patients in these previous studies were closely monitored, and morning systolic blood pressure was well controlled. However, the five patients in this study had the sudden complication of refractory hypertension during the follow-up period.

A large epidemiological study covering the active ages showed that the incidence of hypertension among patients with sleep disorders was double that of those without sleep disorders.[3] Adrenergic stress is increased as a result of shortened sleep length or lower sleep quality. In a previous study, it was evident that patients who had sleep disorders suffered markedly from refractory hypertension due to the persistent day-long activity of the adrenergic nervous system.[4] Although the patient has no sleep disorder, anxiety itself is also associated with hypertension and cardiac events.[5] In this study, the reason patients suffered refractory hypertension was not clear initially. Therefore, there may be cases where optimal care for patients with BAD was slightly delayed. In fact, there must be many patients who suffered from sleep disorders due to anxiety after the disaster not only in Japan, but all over the world. As mentioned earlier, sleep disorders are considered to be a risk factor for rapid enlargement of the distal aortic arch in patients with BAD due to the complication of refractory hypertension.

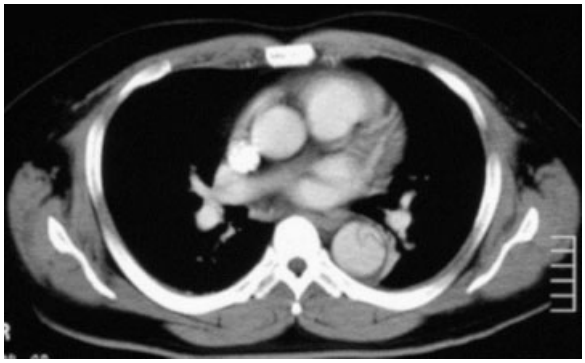

Figure 2 Contrast computed tomographic findings before the disaster.

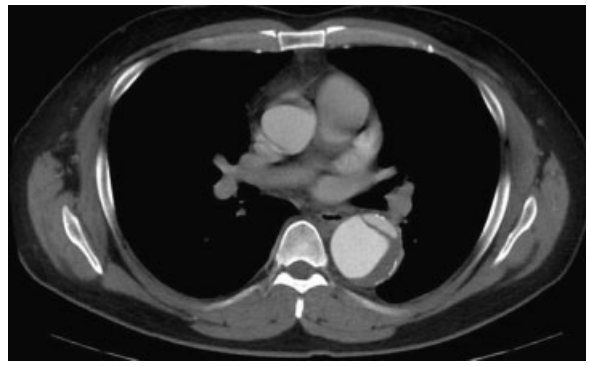

Figure 3 Contrast computed tomographic findings after the disaster.

Study Limitation

This study has several limitations. It is a retrospective observational analysis of a single institution. Therefore, the sample size is small. The direct causality between the aortic enlargement and big disaster is scientifically hard to prove. However, we may suspect that insomnia as a result of catastrophe lead to refractory hypertension, which in turn, lead to rapid aortic enlargement of chronic type B dissection from a review of the relevant literatures. Further research is required on this subject.

Conclusions

In primary care for patients with mental stress after a big disaster, it is important to keep a careful monitoring of blood pressure besides assessment of anxiety and sleep. If patients have severe sleep disorders, appropriate treatment is essential to prevent refractory hypertension.

Conflict of Interest
There are no personal conflicts of interest.

References

1 Hata M, Sezai A, Niino T, et al. Prognosis for patients with type B acute aortic dissection: risk analysis of early death and requirement for elective surgery. Circ J 2007;71(8):1279–1282
2 Kato M, Bai H, Sato K, et al. Determining surgical indications for acute type B dissection based on enlargement of aortic diameter during the chronic phase. Circulation 1995;92(9, Suppl): II107–II112
3 Suka M, Yoshida K, Sugimori H. Persistent insomnia is a predictor of hypertension in Japanese male workers. J Occup Health 2003; 45(6):344–350
4 Tochikubo O, Ikeda A, Miyajima E, Ishii M. Effects of insufficient sleep on blood pressure monitored by a new multibiomedical recorder. Hypertension 1996;27(6):1318–1324
5 Frasure-Smith N, Lespérance F, Talajic M. The impact of negative emotions on prognosis following myocardial infarction: is it more than depression? Health Psychol 1995;14(5):388–398