Editorial

Warning Signs in Aortic Dissection

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Last month my colleague saw a 41-year-old lady who presented to our emergency department (ED) with initial syncope and general weakness. Although she was clear conscious at the triage, sudden collapse with loss of vital sign happened to her ten minutes after arrival of ED. After my colleague immediately resuscitated and arranged computed tomography (CT), Stanford type a aortic dissection (AD) was diagnosed. Unfortunately, she died of aortic dissection although aggressive resuscitation was applied without delay. Aortic dissection with neurologic presentation is relatively high risk to mortality (2.3-fold) than those aortic dissection patients without neurologic presentation [1]. It is a life-threatening disease in ED although the diagnosis was already made.

AD is a relatively seldom seen cardiovascular emergency in the ED. It occurs when the aortic intima tears and blood flows into the aortic media forming a false lumen in image study. Uncontrolled hypertension, connective tissue disorders, congenital aortic valve disorder, syphilis infection, illicit drug usage, and medial degeneration of aorta are risk factors in AD. It tended to happen more commonly in elderly (56.4%) and male (male: female = 2.9: 1) patients [2].

There are two system classified AD cases. The Stanford classification divides dissections into two types, type A and type B. Type A involves the ascending aorta (DeBakey types I and II); type B does not (DeBakey type III). The other classification is DeBakey classification, and it divides dissections into three types. Type I involved the ascending aorta, aortic arch, and extending to descending aorta. Type II is confined to the ascending aorta. Type III is confined to the descending aorta [3]. In the anatomical classification, Stanford type A is the more common type (54%) than Stanford type B (46%) [2].

In circadian and season distribution, 57.7% of aortic dissections are happened in the night time (19:00 p.m. till next day of 7:00 a.m.) and winter (35%) [2]. AD occurred most in winter, because the cold weather causes vasoconstriction and blood pressure elevation. High blood pressure is a significant risk of happening AD [4].

In comorbid diseases, there are 71 to 75% AD patients are hypertensive (SBP > 140 mmHg) while arrival of ED in the year of 2007 and 2008 [3,5]. But only near half of AD patients (47.4%) presented to the triage of ED with systolic blood pressure (SBP) at triage > 140 mmHg in the year of 2015 [2]. Obviously, diabetes mellitus (DM) is relative uncommon in patients with AD, only 9% of AD patients having DM [2].

In symptoms, the character of chest pain (41 to 63%) is tearing, probably radiating to the back, or extending from the chest to the abdomen with probably seen cold sweating. The patients in AD involving coronary artery have the clinical appearance mimicking acute coronary syndrome (ACS). Nevertheless, patients in AD involving descending aorta have pain or paresthesia involving upper chest, dorsum, waist, abdomen or lower limbs [3,5]. In the elderly AD patients showed relative lower systolic blood pressure (SBP) and more instances of hyperglycemia and neurologic deficit (28.9%), but less chest and abdominal pain presented [4]. Above seventy of AD patients had typical presentations such as chest pain and/or chest tightness, but only 26% having abdominal discomfort and 17 to 19% having neurological symptoms (headache, transient global amnesia, stroke-like, seizure, syncope) [2,4].

Clinically we can find widened mediastinum or abnormal aortic contour in chest X ray of AD patients, and the sensitivity of AD plain chest X ray abnormal results reaches about 90% [2]. Actually mediastinal width (MW) is associated with aging, those of lethal cases and wider in longer hospital stay. The mediastinum width (MW) in expired AD cases is wider than survival ones (9.9 cm vs. 9.4 cm). MW is not strongly related to gender, type classification of AD, and history of DM [2]. In other diagnostic tool, standard or transesophageal echocardiography (TEE) can also reliably detect aortic dissections, even very small ones [5].

Generally speaking, the inter-limbs blood pressure differences (BPD) are one of the clues in diagnosing AD. Many emergency physicians consider the BPD is meaningful when above 20 mmHg. Actually a retrospective study was made and inter-arm SBP difference is 14.5 +/- 15.7 mmHg, and the inter-leg SBP difference is 12.5 +/- 14.3 mmHg. So the range varies, and BPD is not a reliable tool to diagnose AD by this finding of research [3]. Interestingly the inter-arm systolic BPD (IASBPD) plays an important role in the SBP on arrival of ED. We found the lower SBP on arrival to the ED in the IASBPD > 14.5 mmHg group was found. On the other hand, the inter-leg systolic BPD (ILSBPD) affects the hospital stay major. The higher ILSBPD is, the longer hospital-stay needed [3].In treatment, most studies suggest operations for cases of Stanford type A and complicated Stanford type B AD, while non-complicated Stanford type B was usually managed with medication [4]. Mortality rate is around 24.4%. Warning sign in risk factors of mortality in AD patients are elderly (2-fold), female, hypotension (3.7-fold), presentations of neurologic symptoms (2.3-fold), wider MW, higher D-dimer levels, longer hospital stay, higher possibilities for surgical interventions and hospitalized during the

weekends [2]. For emergency physician, it is important not only to early diagnose AD but also to pay attention to the AD patients with warning signs.

References

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