Key words : Type A aortic dissection, motion artifact

Motion Artifact Mimicking a Type A Aortic Dissection

Masayoshi UMESUE*

Abstract

Acute Type A dissection is an emergent entity requiring a surgical correction and usually diagnosed on enhanced CT and/or trans-esophageal echogram. On the CT, false positive diagnosis can be caused by many conditions including streak artifacts, periaortic structures (eg, pericardial recess, pericardial effusion, arch branches and veins) and motion artifact of aortic wall. We present an emergent case that had been diagnosed by enhanced computed tomography with multidetector row as having a dissection on the ascending aorta and proved as having no dissection by open surgery. The preoperative CT finding was considered as a motion artifact of aortic wall based on the operative findings. Perceptive interpretation of clinical findings and images is required when the diagnosis of aortic dissection is made on a computed tomography alone.

A 32-year-old tall man presented to a local hospital with a stubborn chest pain of sudden onset and palpitation. He had a family history of sudden death, his father and two uncles having died with unknown etiology at the ages of 30, 30 and 42, respectively. He was referred to us for further treatment on the basis of a transthoracic echocardiography which showed dilated valsalva sinus of 67 mm and moderate to severe aortic insufficiency. An enhanced computed tomography (CT) with multidetector row (Aquilion 8, Toshiba Medical Systems, Japan) demonstrated a linear low attenuation in the ascending aorta at the level of the bifurcation of pulmonary trunk (**Fig. 1 A**, grey arrows). Coronal view (**Fig. 1 B**) showed a dilated aortic root of pear-like shape (black arrow heads) and a short linear low attenuation (white arrow) extending from the ridge between the dilated and non-dilated segments of the ascending aorta. The CT also revealed two flaps in the descending aorta dividing the aorta into three lumens (**Fig. 1 C**). On the basis of the clinical history and CT findings, a presumptive diagnosis of Stanford type A dissection, based on the annulo aortic ectasia with etiology of Marfan's syndrome, was made. Aortic root replacement and total arch replacement were planned and he was transferred to the operating room promptly. Intraoperative transesophageal echocardiography showed markedly dilated aortic root, severe aortic regurgitation and aortic dissection on the descending aorta, but no apparent intimal flap on the ascending aorta. A median sternotomy was made and his ascending aorta was found to be pear-like in shape and of a normal color. The aortic root was dilated saccularly and 70 mm in diameter at the sinotubular junction level. The distal portion of

*Department of Cardiovascular Surgery, Matsuyama Red Cross Hospital

the ascending aorta was normal in size and clamped under cardiopulmonary bypass. The ascending aorta was transected horizontally at the sinotubular junction level and opened with a longitudinal aortotomy, and found to contain no dissection inside. At this stage, our original preoperative diagnosis, which presumed a dissection on the ascending aorta, was abandoned and the linear low attenuation on the ascending aorta on the CT scan was considered as a motion artifact of the aortic wall especially around the ridge between proximal dilated segment and non-dilated distal segment of the ascending aorta. His aortic valve had three stretched leaflets and dilated annulus. Aortic root replacement was conducted with a composite graft comprising a mechanical valve and a straight Dacron graft. Coronary arteries were reimplanted onto the composite graft. The postoperative course was uneventful. The patient was discharged from intensive care unit the next day and admitted to a cardiology department for medical treatment of the aortic dissection of his descending aorta.

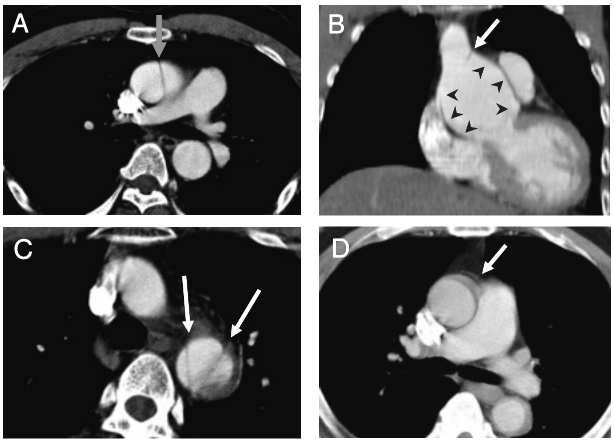

Fig. 1

A) Axial CT scan showing a linear low attenuation (grey arrow) on the ascending aorta at the level of the bifurcation of pulmonary trunk.

B) Coronal view showing a pear-like shaped dilated aortic root (black arrow heads) and a short linear low attenuation (white arrow) extending from the ridge between the dilated and the non-dilated segment of the ascending aorta.

C) Axial CT scan showing two flaps (white arrows) dividing the descending aorta into three lumens with one lumen partially thrombosed.

D) A CT scan from another patient showing a typical aortic motion artifact of crescent shape structure simulating a false lumen around one o'clock (white arrow), which was proved as false positive by an epi-aortic ultrasound echogram under a median sternotomy and also by a repeated CT scan later on.

Acute Type A dissection is an emergent entity requiring a surgical correction and usually diagnosed on enhanced CT and/or trans-esophageal echogram. On the CT, false positive diagnosis can be caused by many conditions including streak artifacts, periaortic structures (eg, pericardial recess, pericardial effusion, arch branches and veins) and motion artifact of aortic wall (**Fig. 1 D**)[1)2)]. Proper diagnosis needs perceptive interpretation of clinical findings and images.

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A型大動脈解離と診断された大動脈 motion artifact

梅末　正芳*

*松山赤十字病院　心臓血管外科

スタンフォードA型解離は緊急手術を要する大動脈疾患であり，通常，造影CTや経食道超音波検査にて診断がなされる．CT検査においては，ストリークアーチファクトや大動脈周囲の構造物（例えば心嚢窩，心嚢液，大動脈弓部分枝等），および大動脈壁のモーションアーチファクトを大動脈解離と判断してしまう可能性がある．今回マルチディテクターCTにて上行大動脈に解離があると判断し手術施行するも，手術所見において解離を認めなかった緊急症例を経験したので報告する．術中所見より，術前CTにて認めた大動脈解離の所見は大動脈壁のモーションアーチファクトによるものと考えられた．CT所見のみにて大動脈解離の診断を行う際には，臨床所見並びに画像所見を注意深く解釈する必要がある．

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