# **Aortic Aneurysm: Dissection from the Root to Pelvis**

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## Abstract

Isolated pelvic pain caused by aortic dissection is a very uncommon clinical presentation. This life-threatening cardiovascular lesion needs prompt diagnosis and intervention to prevent rupture. We report the case of a 45-year-old woman with Marfan syndrome who presented to our gynecologic clinic with low abdominal pain. Bedside point-of-care ultrasound revealed the bilocular echo lucent cystic lesion indicating the dissection of common iliac artery in her pelvis.

Keywords: Aortic dissection, Marfan's syndrome, pelvic pain, pointofcare ultrasound

## INTRODUCTION

It is always a challenge to reach the diagnosis of aortic dissection due to its various clinical presentations. The classic signs and symptoms are sudden onset of chest pain, upper back or stomach pain, dyspnea, or weakness in limbs. The presentations are associated with the extension of dissection originated from the aortic root to iliofemoral artery [Figure 1]. This high morbidity and mortality condition of aortic dissections and rupture are strongly related with hypertension and other specific underlying causes.

# **CASE REPORT**

A 45-year-old woman diagnosed with Marfan syndrome at youth, visited gynecology clinic with a compliant of dull, persistent low abdominal pain which radiated to her pelvis for 2 days. She had also hypertension and diabetes mellitus for years. Physical examination revealed the soft abdomen and gynecological pelvic ultrasound showed small fibroids in the uterus. Concurrently, a 3-cm bilobular echo lucent cystic lesion with turbulent blood flow was detected at the left lower abdomen [Figure 2a and b transabdominal ultrasound, arrow]. Immediate abdominal ultrasound was referred to an internist, revealing aortic dissection with intimal tear of the false lumen at the descending aorta in the upper abdomen. An axial computed tomography angiogram (CTA) of the chest, abdomen, and pelvis was then performed immediately

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at emergency department (ER), which demonstrated that an extensive DeBakey Type III aortic dissection, measuring with a dilated aortic diameter of 3 cm, from the ascending aorta all the way down to the descending aorta and into the common iliac artery and the right iliac artery [Figures 3 and 4 sagittal image, white arrows]. The celiac trunk, superior mesentery, and right renal artery were arising from the false lumen without signs of organ ischemia or vessel occlusion. Surgical repair was immediately arranged, but the patient had a sudden drop of blood pressure and failed to revived from resuscitation in the intensive care unit.

CME Credits

## DISCUSSION

Aortic aneurysms tend to remain asymptomatic with a long latent period, but once they rupture, or dissecting, would has a high mortality rate of over 80%.<sup>[1,2]</sup> Basically, there are two common types of classifications, the Standfort and the Debakey. According to the Stanford type, which divided aortic dissections into two types by the most proximal involvement: Type A: Any place the aortic wall and the ascending aorta (as for Debakey Types 1 and II) and Type B: Aortic wall dissecting from the lower artery opening of the left clavicle and extends into the distal descending aorta (as for Debakey Type III). According to the De Bakey classification, dissection is divided into three

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Figure 1: Classifications of aortic dissection: Standfort and Debakey



Figure 3: Transverse view of abdominal aorta through computed tomography angiogram

types [Figure 1]. The CTA in this case presented at ER was classified as the severe Standfort Type A or Debakey Type III.

The underlying risk factor with aneurysm is weakening of the intimal layer of aortic wall, causing tear and progressive dissection or even rupture. Some aortic aneurysms have a clear traumatic etiology and some are secondary to underlying conditions, such as atherosclerotic disease, connective tissue disease (i.e., Marfan syndrome and Ehlers–Danlos Type IV), infectious disease (i.e., tuberculosis, syphilis, bacteria, and fungi), and inflammatory diseases. Among the above-mentioned conditions, connective tissue diseases such as Marfan syndrome and Ehlers–Danlos Type IV are the most underlying diseases associated with aortic aneurysm. Marfan syndrome with lacking of Fibrillin 1 tends to nave reduced elastin content and easy ruptured of elastic fibers, resulting in the high incidence of aortic aneurysm or dissection.<sup>[2,3]</sup>

Symptomatic aneurysms can be detected easily using ultrasound by ER and cardiovascular medical staffs. When the diameter of the aortas measuring >25 cm are classified as "abnormal"



**Figure 2:** Transverse view of abdominal aorta through abdominal ultrasound. (a) A 3-cm bilobular echo lucent cystic lesion, presenting as the true and false lumen. (b) Turbulent blood flow in true and false lumen



Figure 4: An axial computed tomography angiogram showing the aortic dissection in the chest, abdomen, and pelvis

and basically those measuring <2.5 cm are as "normal."<sup>[4-6]</sup> The typical CTA presentation of aorta dissection is the bi-luminal of the true and false lumens. True lumen is often compressed by the greater pressure of the false lumen and has outer wall calcifications. The true lumen would involving the aortic root, the origins of the celiac trunk, superior mesenteric artery, and right renal artery. The false lumen is often having the larger lumen size due to higher pressure, has lower contrast density due to delay opacification. Associated with beak sign, cobweb sign and the left renal artery usually arises from the false lumen. In summary, ultrasound has been used as a successfully tool to exclude an abdominal aortic dissection in symptomatic patients with pain or hypotensive in the ER. As well as for routine aortic diameter monitoring in specific populations with susceptibility gene mutations or expression high levels of pathogenic proteins or metabolite. Furthermore, a high sensitivity and specificity, approximately 99% of the population can be reliably visualized by performing the ultrasound for diagnosing aortic aneurysm. The screening for aneurysms is therefore worth to reduce the incidence of sudden ruptured aneurysms and hence reduce unnecessary mortality. In addition, pelvic artery aneurysm screening could also provide prognostic value in patients with a history known of having thoracic aortic aneurysms.<sup>[1,4,6]</sup>

# CONCLUSIONS

Aortic dissection has always be aware of in patients with Marfan's syndrome. Point-of-care ultrasound is a useful bedside tool for the rapid diagnosis of aortic dissection not only at ER but also in the gynecology clinic.

#### Ethical statement

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and its amendments. The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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#### **Conflicts of interest**

There are no conflicts of interest.

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