

Dissection of Arteria Lusoria by Transradial Coronary Catheterization: A Rare Complication Evaluated by Multidetector CT

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An aberrant right subclavian artery (arteria lusoria) arising from the descending thoracic aorta is an uncommon congenital variant that occurs in about 0.2–1.7% of the population. In such cases, the angular course of the arteria lusoria to the ascending aorta imposes difficulty in passing a guide wire to the ascending aorta during right transradial catheterization. Here, we present the first report of an iatrogenic dissection of arteria lusoria during transradial coronary angiography evaluated by multidetector computed tomography. Computed tomography is useful for assessing the severity and extension of the dissection to guide the clinical management of this complication. [*J Chin Med Assoc* 2009;72(7):379–381]

Key Words: aberrant right subclavian artery, arteria lusoria, complication, dissection, transradial catheterization

Introduction

Since its introduction to coronary angiography in 1989, transradial catheterization has become increasingly popular because it allows patients to ambulate earlier. It has a high success rate and a low risk of complications.^{1–4} However, only 60% of cases in 1 study were successfully performed by transradial approach in patients with arteria lusoria—the aberrant right subclavian artery.⁵ Dissection of an arteria lusoria and aorta as a complication of transradial catheterization as demonstrated by multidetector computed tomography (CT) has not been previously reported. Here, we present a patient who experienced this complication during transradial coronary angiography. We found that CT was very useful in evaluating the severity of the vascular injury and guide the clinical management of the complication.

Case Report

A 50-year-old man with chronic angina was admitted for coronary angiographic evaluation. Clinical examination and laboratory studies revealed no particular findings

except for ischemic change on exercise electrocardiography. During catheterization from right radial artery, the guide wire (0.035 inch; Terumo Corp., Tokyo, Japan) was prone to advance into the descending aorta. After several attempts, the guide wire passed into the ascending aorta. However, resistance was encountered while advancing a pigtail catheter (5-Fr; Bard Inc., Murray Hill, NJ, USA). Stasis of contrast medium was noted after test injection of 5 mL of contrast medium. Catheterization was stopped immediately and emergent multidetector CT was arranged for evaluation of the aortic injury.

Non-contrast CT revealed contrast medium retained in the false lumen of the distal aortic arch and descending aorta (Figure 1A). Multiplanar reformation of CT angiography disclosed a retrograde spiral dissection over the right subclavian artery (Figure 1B) and antegrade dissection to the mid segment of the descending thoracic aorta. In addition, the right subclavian artery arose from the distal aortic arch and had a retrosophageal course—so-called arteria lusoria. The angle between the arteria lusoria and the aortic arch was acute (about 70°; Figure 2). As CT clearly showed that the true lumen at the entrance site of the



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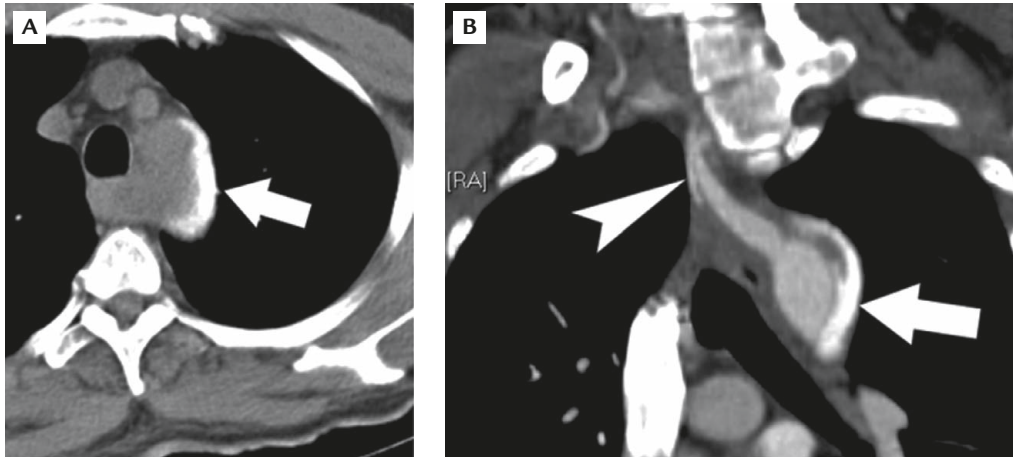


Figure 1. (A) Non-contrast axial and (B) contrast-enhanced multiplanar reconstructed computed tomography reveal a crescent-shaped high-attenuation false lumen over the distal aortic arch and descending aorta (arrows), which confirmed the suspected aortic dissection. Also noted was the spiral dissection in the right subclavian artery which showed partial thrombosis (arrowhead, entrance point).

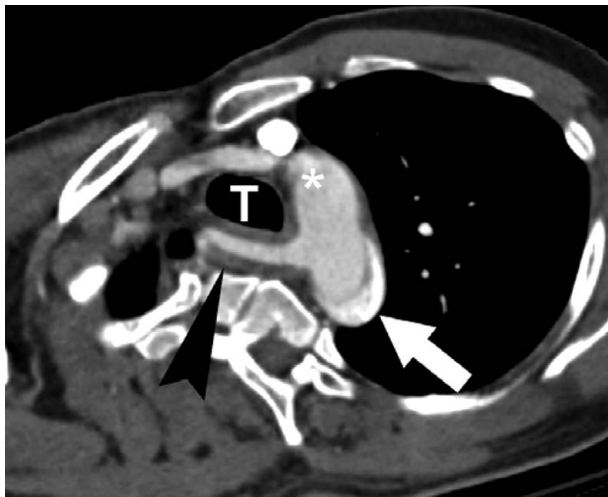


Figure 2. Multiplanar reconstructed computed tomography angiography shows the aberrant right subclavian artery (arrowhead) arising from the distal aortic arch and forming an acute angle (70°) with the proximal aortic arch (*), which underscored the difficulty in passing a guide wire to the ascending aorta. Arrow indicates the false lumen with retained contrast medium. T=trachea.

dissection was not compromised, and there was no apparent discrepancy in blood pressure between the bilateral arms, no further intervention such as stenting was done. Two months later, follow-up CT showed complete resolution of the false lumen in arteria lusoria and aorta.

Discussion

An aberrant right subclavian artery (arteria lusoria) arising from the descending thoracic aorta is an

uncommon but well-known congenital variant. It is the fourth most common aortic arch anomaly and has an incidence of 0.2–1.7% in the literature.⁶ Abnormal involution of the fourth right aortic arch causes the persistence of the intersegmental artery, which assumes a retroesophageal position and distal aortic arch origin.^{7,8} Despite its frequency, it is not often diagnosed as the anomaly is usually asymptomatic.

Since transradial catheterization was introduced to coronary diagnostic procedures in 1989 and coronary intervention in 1993, it has become increasingly popular because it allows patients to ambulate earlier. It has a high success rate and a low risk of complications.^{1–4} However, according to the literature, only 60% of cases were successfully performed by transradial approach in the setting of an arteria lusoria.⁵ This congenital variant makes the right transradial route difficult to approach the ascending aorta, as it requires the catheter to curve back to reach the aortic root. It is difficult to identify this variant on postero-anterior projection of conventional angiography. However, the guide wire from the right subclavian artery repeatedly entering the descending aorta rather than the ascending aorta should indicate this possibility.⁹ In this situation, an oblique view of the right subclavian angiogram showing the right subclavian artery arising distal to the left subclavian artery might be helpful.¹⁰

To the best of our knowledge, retrograde dissection of arteria lusoria to the aorta as a complication of transradial coronary angiography has not previously been reported in the literature. CT provides a detailed assessment of this common variation of the aortic arch and explanation for the potential risk of iatrogenic dissection. Familiarity with variant anatomy also facilitates the

use of an alternative guide wire technique to approach the ascending aorta.

Since the success rate of the right transradial approach in the setting of an arteria lusoria is only 60%, with an additional potential risk of dissection as in our patient, we suggest that arch anomaly be considered and included in pre-intervention planning.^{11,12} For this purpose, images from previous chest CT performed for other indications should be reviewed if available; alternatively, a short range of CT scan covering the aortic arch could be added into the protocol of CT coronary angiography to evaluate arch anatomy.

In conclusion, an aberrant right subclavian artery (arteria lusoria) arising from the descending thoracic aorta is an uncommon congenital variant. This first report of dissection of arteria lusoria during right transradial catheterization alerts us to the importance of this congenital variant. Caution should be taken in this scenario to avoid this complication.

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