

Dissection of Arteria Lusoria during Transradial PCI: A Rare Complication revealed and followed by Multidetector CT

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Abstract: Though the radial artery is an ideal site of access for coronary percutaneous interventions (PCI), anatomical variations may render this procedure more challenging. An aberrant right subclavian artery (arteria lusoria) arising from the descending aorta is an uncommon congenital variant that occurs in about 0.2–1.7% of the population. In such cases, the angulated retroesophageal course of this artery to the descending aorta imposes difficulties in advancing a guide wire to the ascending aorta during right transradial catheterization. Performing angioplasty by the same way becomes also a difficult task, and requires greater perseverance and skills. We present a report of a iatrogenic dissection of the arteria lusoria during right transradial coronary percutaneous intervention evaluated and confirmed by multidetector computed tomography. This imaging modality is useful to assess the severity and extension of the dissection in order to guide the clinical management of this complication.

Keywords: Aberrant right subclavian artery, arteria lusoria, complication, dissection, transradial catheterization.

INTRODUCTION

Transradial cardiac catheterization and PCI have become increasingly popular because they have a low risk of complications and allow the patients to ambulate earlier [1-4]. However, anatomical variations may render this procedure more challenging. An aberrant right subclavian artery (arteria lusoria) arising from the descending aorta is an uncommon congenital variant that occurs in about 0.2–1.7% of the population. In such cases, only 60% of cases are successfully performed by right transradial approach in patients with arteria lusoria [5]. Dissection of an arteria lusoria and aorta as a complication of right transradial catheterization as demonstrated by multidetector computed tomography (MDCT) has been reported only once previously [6]. Here, we present a patient who experienced this complication during transradial coronary angiography and PCI. 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 69-year-old man with acute infero-lateral ST elevation myocardial infarction was admitted to our

Hospital. The patient underwent primary PCI of the proximal circumflex artery (the “culprit lesion”) through a right femoral approach. The coronary angiography revealed also a stenosis on the distal tract of the right coronary artery. Some days later, an dobutamine stress echocardiography proved silent ischemia. So the patient was underwent a staged procedure for the right coronary artery.

During catheterization through right radial artery, the second line guide wire (0.035 inch; Terumo Corp., Tokyo, Japan) was prone to advance into the descending aorta. After several attempts, it was impossible to advance the guide wire into the ascending aorta. The operator decided to cross over to the left femoral artery. From this approach successful and uncomplicated PCI of the right coronary artery was performed. Twelve hours later, the patient complained of right arm pain and a small hematoma was evident in the middle of right arm. An urgent MDCT was planned for evaluation of the arterial course. The MDCT revealed a retrograde spiral dissection in the subclavian right artery (Figure 1). The MDCT revealed also an anatomic variation consisting of a subclavian artery arising from the descending thoracic aorta just distal to aortic arch, with retroesophageal course (arteria lusoria, Figures 2, 3). The angle between the arteria lusoria and the aortic arch was acute (about 70°; Figure 2).

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Figure 1: 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 spiral dissection of the subclavian arteria lusoria with partial thrombosis (arrows, entry point).

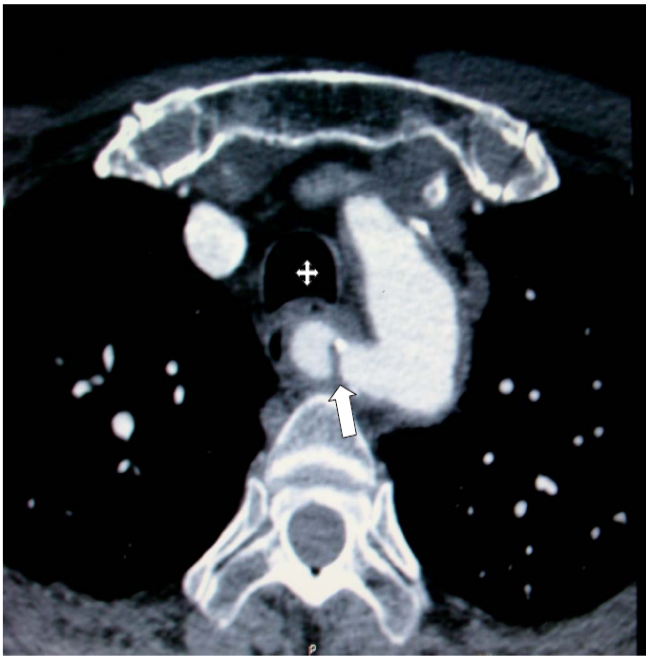


Figure 2: Multiplanar Computed Tomography shows the aberrant right subclavian artery arising from the distal aortic arch and forming an acute angle (70°) with the proximal aortic arch, which underscored the difficulty in passing a guide wire into the ascending aorta. The arrow indicates the false lumen with retained contrast medium. The + indicates the trachea.

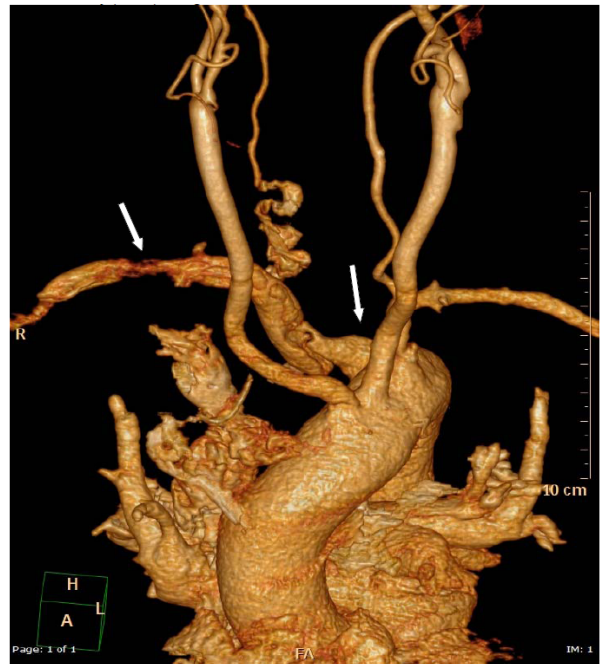


Figure 3: Multiplanar Computed Tomography angiography (reconstruction 3D) shows the aberrant right subclavian artery (arrows) arising from the distal aortic arch.

The MDCT showed that the true lumen at the entrance site of the dissection was not compromised. Moreover, there was no apparent discrepancy in arterial pressure between the two arms, and no echodoppler alterations were noted. Based on these findings, no further intervention was done. Three months later, follow-up MDCT showed complete resolution of the dissection in the arteria lusoria.

DISCUSSION

An aberrant right subclavian artery (arteria lusoria) arising from the descending thoracic aorta is an uncommon but well-known congenital variant. 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 for percutaneous coronary procedures, it has become increasingly popular because it has a low risk of complications and it allows patients to ambulate earlier [1-4].

However, anatomical variations may render this procedure more challenging. In patients with arteria lusoria, only 60% of cases are successfully performed by right transradial approach [5]. This congenital variant makes the approach to the ascending aorta

difficult from the right transradial route, as it requires the catheter to curve backwards to reach the aortic root. It is difficult to identify this variant on a postero-anterior projection with conventional fluoroscopy. However, in case the guide wire repeatedly enters the descending aorta rather than the ascending aorta from the right subclavian artery, this possibility should be suspected [9].

In this situation, an right anterior 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 the arteria lusoria to the aorta as a complication of transradial coronary angiography has been previously reported only once in the literature [6]. Computed tomography provides a detailed assessment of this common variation of the aortic arch and explanation for the potential risk of iatrogenic dissection. Familiarity with this anatomical variation may facilitate 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 not high and with an additional potential risk of dissection (as in our patient), we suggest that arch anomalies may be considered if the guide wire, in expert hands, is not able to pass into the ascending aorta. This analysis should be included in the pre-intervention planning [11, 12].

For this purpose, images from previous chest MDCT performed for other indications should be reviewed if available. Alternatively, a short range of MDCT scan covering the aortic arch could be added into the protocol of MDCT coronary angiography to evaluate arch anatomy.

In conclusion, an aberrant right subclavian artery (arteria lusoria) arising from the descending aorta is an uncommon congenital variant. Our report of a dissection of the arteria lusoria during right transradial catheterization alerts us for the importance of this congenital variant. Caution should be taken to promptly switch to another access site before the complication

occurs or even better to avoid completely the right radial access site in this scenario.

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