

Navigating through tortuosity: “A S-shaped abdominal aorta”

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ABSTRACT

Tortuosity of the abdominal aorta is common to encounter during transfemoral intervention in the elderly cohort but an extreme form of abdominal tortuosity assuming S-shape has not been reported so far. We report a case of an extreme form of abdominal aorta tortuosity in 65-year-old male in whom successful coronary intervention was performed with Amplatzer extra stiff (0.038) wire and larger guide catheter (EBU 7F 3.5) for good back up support. Rare to encounter, this extreme S-shaped tortuosity in a young-old patient remembers us the fact that “arteries and aorta can also kink early.”

Key words: Aorta, Coronary artery, Tortuosity

INTRODUCTION

The abdominal aorta (aorta abdominalis) begins at the median aortic hiatus of the diaphragm, anterior to the lower border of the twelfth thoracic vertebra, and the thoracolumbar intervertebral symphysis, and terminates at the body of the fourth lumbar vertebra by dividing into two common iliac arteries [1]. At its origin, the aorta is approximately 20 mm in diameter. After giving off its major branches or at the level of L2 vertebra, it is 16.5 mm in diameter. From this point to the bifurcation, it reduces in diameter slightly, being 15.9 mm at its termination [2].

Variations in the abdominal aorta are also not common [3]. The “S”-shaped tortuosity of the abdominal aorta has not been described in the literature so far; hence, our case is a unique presentation of degenerative atherosclerotic aorta assuming a peculiar S-shaped configuration through which successful coronary intervention was accomplished.

CASE REPORT

65-year-old non-diabetic male presented with complaints of retrosternal chest discomfort with diaphoresis and shortness of breath for the past 18 h. History revealed that he had walk through angina for the past 2 years with no history of limb claudication.

On clinical examination, he had a pulse rate of 96 beats/min with a blood pressure of 106/70 mmHg in the right arm supine position and had left ventricular fourth heart sound (S₄) on auscultation.


Electrocardiogram revealed acute ST elevated myocardial infarction. Echocardiography revealed regional wall motion abnormality in the left anterior descending (LAD) artery territory and was subjected to the transradial coronary angiogram. Significant tortuosity at innominate bifurcation precluded left main coronary artery (LMCA) engagement with routine 5F tiger catheter. The left coronary injection was done with JL 6F 3.5 catheter which revealed subtotal occlusion in mid-LAD artery and planned for elective coronary angioplasty.

Engagement of the 6F extra backup (EBU) guide was difficult and the guide was also unstable due to the S-shaped tortuosity of the abdominal aorta (Fig. 1) which was overcome with Amplatzer extra stiff 0.038 wire and 7F EBU guiding catheter was used to engage the LMCA with which successful stenting of mid-LAD was done with drug-eluting stent.

Although tortuosity is a common phenomenon in the elderly and females, this extreme form of S-shaped tortuosity of the abdominal aorta is rare to encounter in routine interventional practice. Exchange with a more stiff wire, upgradation of the guide catheter, and putting a long sheath (45 cm) overcome the issue of catheter stability during coronary intervention. Slow advancement of the coronary hard ware is the dictum to prevent inadvertent aortic dissection and perforation while negotiating through this tortuosity.

DISCUSSION

Tortuosity of the abdominal aorta ranges from mild tortuosity to corkscrew aorta [4,5]. S-shaped tortuosity of the abdominal aorta has not been described in the literature so far. Although

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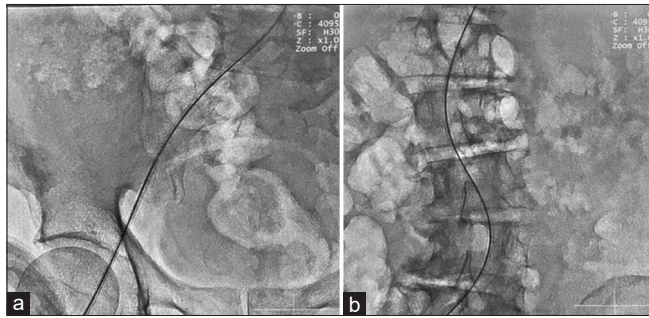


Figure 1: (a) No significant tortuosity in common iliac artery; (b) S-shaped abdominal aorta as evident with the course of super stiff guide wire

tortuosity is more common to encounter in the seventh decade, we encountered this rare form of extreme tortuosity in a young-old person of 65 years of age with atherosclerotic involvement of coronary arteries.

Common differential diagnosis is mid aortic syndrome which is an uncommon entity affecting children and young adults characterized by progressive narrowing of the abdominal aorta and its major branches [6]. Arterial tortuosity syndrome (ATS) is another close differential diagnosis which is a rare hereditary, autosomal recessive connective tissue disorder [7]. It is characterized by twists and turns of the blood vessels, tortuosity arises from abnormal elongation of the arteries; since the endpoints of the arteries are fixed, the extra length twists and curves besides developing stenosis and aneurysms.

In ATS, joints are hypermobile, may have contractures with unusually soft and stretchable skin; they may have arachnodactyly, scoliosis, pectus carinatum, pectus excavatum, abdominal or inguinal hernia, or diverticulae of the intestine. People with ATS look older than their age and have distinctive facial features with a narrow face, droopy cheeks, blepharophimosis, beaked nose, high-arched palate, micrognathia, large ears, and keratoconus.

Intervention through tortuosity mandates special techniques such as the use of an extra stiff wire, long transfemoral sheath, good guide catheter support, and slow and steady navigation through the tortuosity. Naganuma *et al.* also described successful transfemoral aortic valve replacement with buddy wire technique

in a patient with an extremely tortuous abdominal aorta [8]. Although tortuosity of the abdominal aorta comes with aging, this type of extreme S-shaped abdominal aorta tortuosity is very rare as the interventionists navigate with new techniques to perform a successful coronary intervention.

CONCLUSION

Navigating arterial tortuosity in the elderly cohort is a common problem in coronary or vascular intervention but this form of extreme S-shaped tortuosity of the abdominal aorta is rare to encounter in clinical practice. Negotiating these tortuosities with extra stiff wire, the use of a long arterial sheath, buddy wire technique, and large EBU guide may overcome the difficulties during the intervention and result in a successful outcome.

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