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LETTER TO THE EDITOR

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Life-threatening complication of untreated coarctation of the aorta in a teenager solidified in a three-dimensional printed cardiovascular model

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A 15-year-old male football player was referred to the documented hospital due to acute severe chest pain and transient loss of consciousness that occurred during strenuous training. Prior to the incident, the patient had experienced several episodes of chest pain within the last year. Several months prior to this he had consulted a cardiologist because of these symptoms. At that time physical examination, electrocardiography and a troponin test were inconspicuous. Echocardiography (TTE) was also scheduled, but the patient did not show-up. At admission the patient complained of tearing chest pain, had a heart rate 120/min and blood pressure 150/90 mmHg. Emergent TTE revealed non-dysfunctional bicuspid aortic valve (BAV) with ascending aortic aneurysm and aortic dissection with a total diameter of 7 cm. Additionally aortic coarctation (CoA) was diagnosed with a pressure gradient of 36 mmHg. Computed tomography confirmed aortic type A dissection restricted to the ascending aorta with false lumen dimensions of 39 × 53 × 64 mm as well as a tight CoA (5.4 × 7.5 mm).

The patient underwent emergent surgery that encompassed supracoronary graft insertion. Postoperatively pharmacotherapy was prescribed for his arterial hypertension. One month later CoA was treated with percutaneous CP covered stent implantation with good angiographic and hemodynamic results. The patient recovery was uneventful, and he has not experienced any adverse event during a 3-month follow-up. The staged approach combining cardiac surgery and less invasive interventional treatment seemed an optimal therapeutic option in this particular patient and has resulted in excellent mid-term outcome. Despite aortic aneurysm dissection is a well-known complication of untreated CoA, especially with coexisting BAV and arterial hypertension, it occurs extremely rarely in childhood. Although chest pain in children is usually considered benign, the presented case underscores the need of a detailed evaluation of this symptom and the role of proper preparticipation sports screening. Recognizing the high educational value of this case and the related imagery a three-dimensional printed cardiovascular model was prepared for medical students and fellows (Fig. 1).

Conflict of interest: None declared

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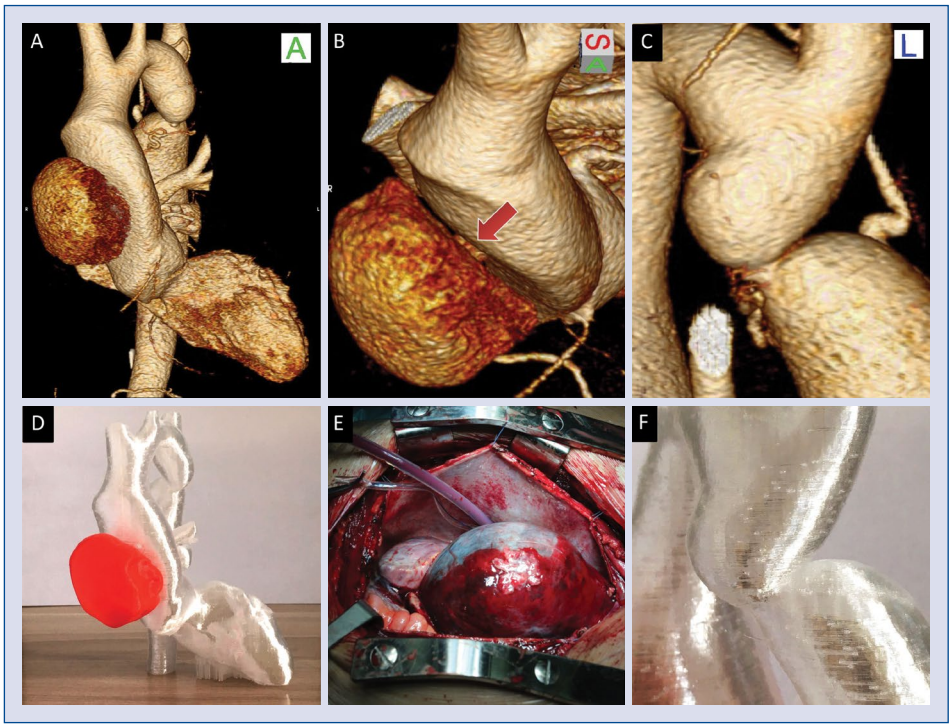

Figure 1. A. Volume rendering of the computed tomography anterior projection showing left ventricle, dilated ascending aorta (pale white) and its rupture into false lumen (orange and red), also the aortic coarctation (CoA) is seen; **B.** Close-up of the rupture region and communication (arrow) between the true and the false lumen; **C.** Lateral view on the region of aortic isthmus showing the CoA; **D, F.** Three-dimensional printed model, views correspond to frames A and C, respectively; **E.** Surgical view, aneurism of the aorta covered by a distended adventitia.