

# Coarctation of Aorta in a 21-year-old Female: A Case Report

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**Abstract Background:** The aortic coarctation is a congenital malformation of the aorta, characterised by the narrowing of the aorta. It represents for 5 – 10% of congenital heart diseases and it shows a male predominance. Its diagnosis is usually posed and treatment done early in life. **Objective:** In this case report, we present a late diagnosis of isthmic aortic coarctation in a 21-year-old female. **Clinical and para-clinical presentation:** The patient was relatively asymptomatic until she was fortuitously diagnosed with hypertension. Physical examination showed blood pressures of 182/89 mmHg (left arm) and of 194/89mmHg (right arm), a bradycardia of 52 beats/minute. On cardiovascular physical assessment was recorded a systolic murmur of intensity 3/6, posterior over the thoracic spine and subclavicular space and a decrease in femoral pulse. Biological exams such as creatininemia and kalemia were normal. The transthoracic echocardiogram showed a stenosis at the isthmic part of the descending aorta, with an increased peak velocity of 3.6 m/s (max gradient = 50 mmHg) and no associated patent ductus arteriosus. Thoracic computerised tomographic (CT) angiography showed an aortic isthmus coarctation with a rounded arch. The CT angiography also recorded duplicated superior vena cava, dilatation of collateral partway below the coarctation to hypertrophied intercostal, internal mammary artery dilatation and Cardiomegaly with left ventricular dilatation. The electrocardiogram recorded a sinus bradycardia at 47 bpm. The chest X-ray noted an enlargement of the cardiac figure, without notching of the ribs. She was addressed to the Cardiac Center of Saint Elisabeth Catholic Hospital of Shison for a surgical management. Meanwhile, she was placed on combined therapy (Atenolol 50mg and Nifedipine 20mg daily) and a good clinical condition was achieved. **Conclusion:** A fortuitously discovered case of late aortic coarctation, diagnosed in a 21 year female during the evaluation of an asymptomatic hypertension. Echocardiographic assessment permitted to pose de diagnosis. Prior to surgical management, Blood pressure controlled was achieved on pharmacological treatment. Due to financial constraint her interventional therapy is pending. The particular aspect in this case was the association of a duplicated superior vena cava.

**Keywords** Aortic isthmic coarctation, Hypertension, Young, Echocardiography, CT angiography

## 1. Case Presentation

We report the case of a relatively asymptomatic 21 year

old woman in whom a grade III Hypertension was fortuitously discovered during a systematic visit in September 2017. She was addressed for a cardiologist consultation during which was recorded elevated blood pressure values on physical examination. She had a blood pressures of 182/89 mmHg (left arm) and of 194/89mmHg (right arm), a bradycardia of 52 beats/minute. On cardiovascular physical assessment was recorded a systolic murmur of intensity 3/6, posterior over the thoracic spine and sub-clavicular space. Femoral pulses were palpable

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bilaterally but weak and delayed compared to the brachial pulses. Her ambulatory blood pressure measurement (ABPM) showed a permanent systolic and paroxysmic diastolic hypertension, with a daytime adrenergic component in a dipper. A regular sinus bradycardia on electrocardiographic examination with heart rate of 47 beats per minute. A mild enlarged cardiac silhouette without notching of the ribs were observed on the chest radiography (Figure 1). The transthoracic echocardiogram showed a stenosis at the isthmic part of the descending aorta, with an increased peak velocity of 3.6 m/s (max gradient = 50 mmHg) (Figure 2) and no associated patent ductus arteriosus. Thoracic

computerised tomographic (CT) angiography showed an aortic isthmus coarctation with a rounded arch (Figure 3A), the presence of a duplicated superior vena cava (Figure 4A), dilatation of collateral pathway below the coarctation to hypertrophied intercostal (Figure 4B), internal mammary artery dilatation (Figure 3B) and Cardiomegaly with left ventricular dilatation; no lungs lesion. These findings are represented in figures below. Biological assessment done for renal function, glycaemia, lipid profile and blood uric acid level where normal. The patient was placed on Atenolol 50mg and Nifedipine 20mg daily then referred to cardiothoracic surgery for an angioplasty.

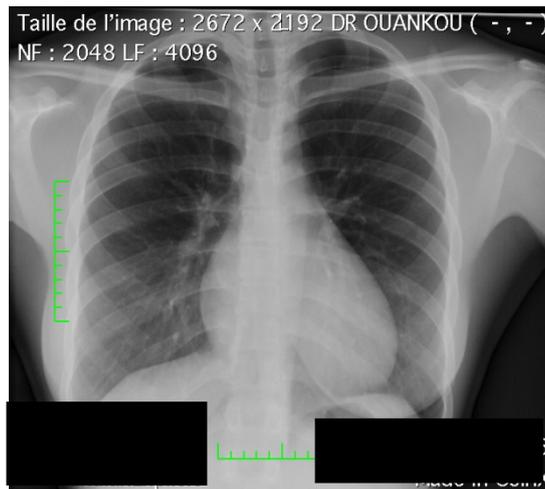


Figure 1. Mild cardiomegaly on chest radiography, without rib notching

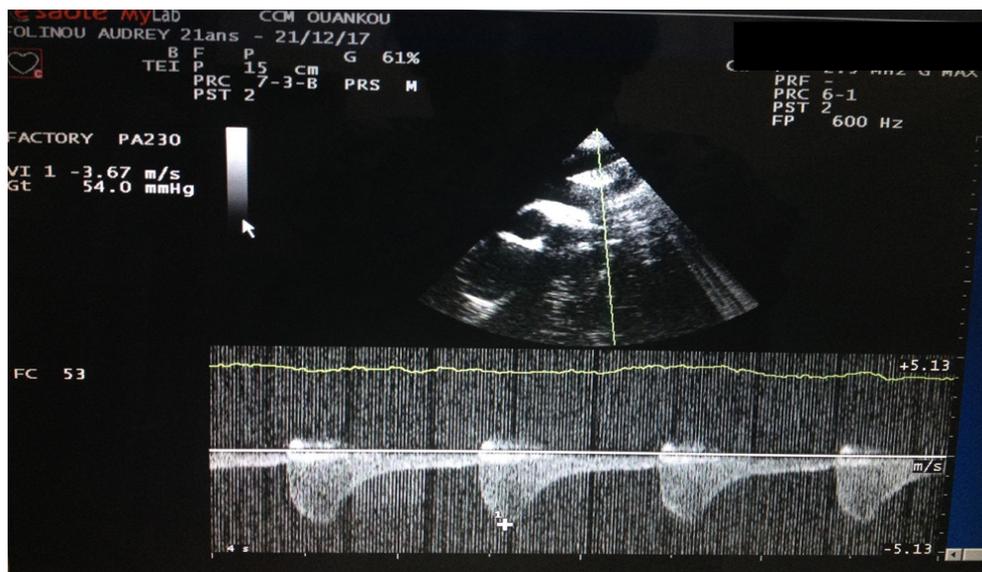
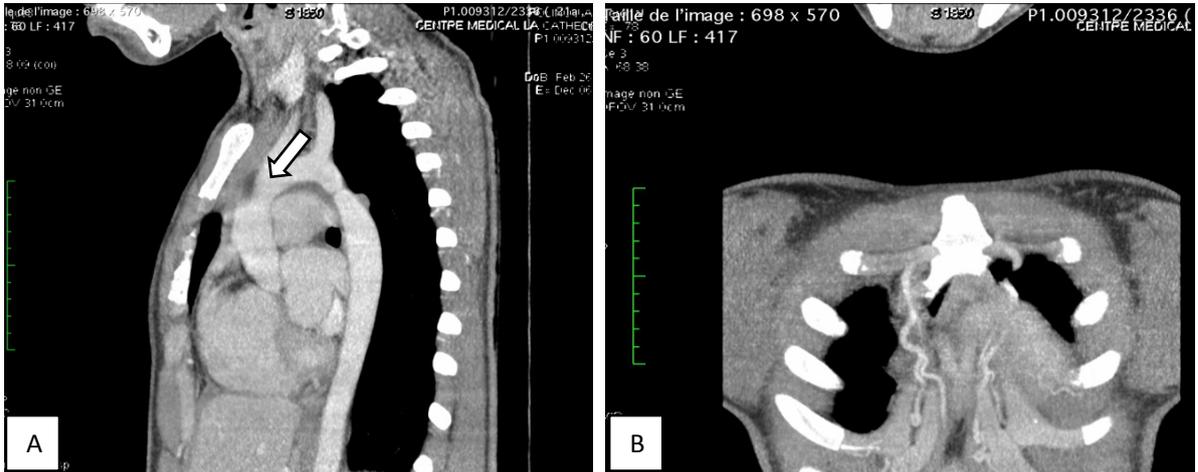
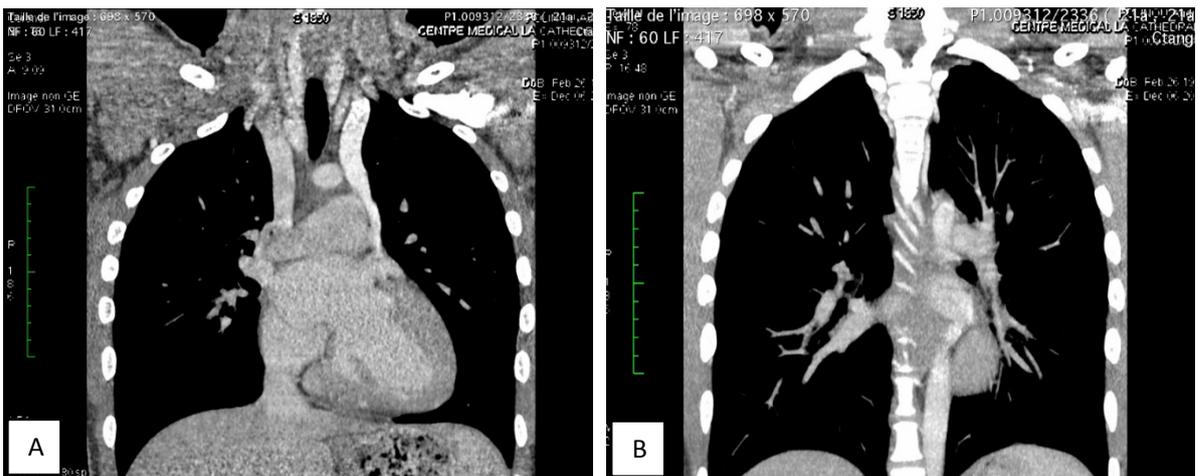


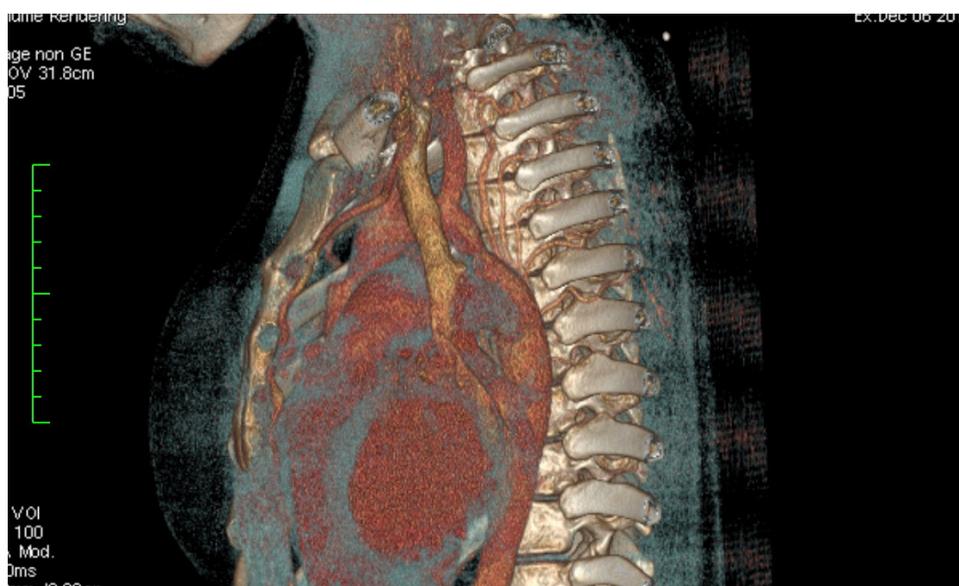
Figure 2. Continuous wave Doppler characteristics, including high speed jet spectrum during systole and extended speed reduction during diastole



**Figure 3.** (A) Coarctation of the aorta: oblique sagittal reconstruction; (B) Hypertrophy of the internal mammary arteries: coronal reconstruction



**Figure 4.** (A) CT angiography showing the presence of a duplicated superior vena cava; (B) Intercostal arteries hypertrophy: coronal reconstruction



**Figure 5.** Volume reconstruction with surface rendering

## 2. Discussion

Aortic coarctation is a congenital vascular lesion typically diagnosed in early life, accounting for 5 to 10% of all congenital cardiovascular malformations [1] but may go undetected well until adulthood [2]. Its clinical presentation beyond infancy is usually asymptomatic. However, they may be clinical signs as: hypertension, headache, nosebleed, leg cramps, muscle weakness, cold feet, or neurologic changes may be seen [3]. Diagnosis is usually based on clinical suspicion and physical findings [4, 5]. The latter include blood pressure difference between the upper and lower extremities, pulse delay and systolic murmur over the thoracic spine [3, 6]. This malformation is usually associated to the Turner syndrome or some congenital cardiac defects like left side obstructive or hypoplastic defects and ventricular septal defects, bicuspid aortic valve, aortic arch hypoplasia, and rarely, various right side obstructive lesions [7]. In this case, we reported a relatively asymptomatic patient until she was fortuitously recorded hypertension during a routine check-up. The clinical suspicion was evident with classical findings in aortic coarctation such as permanently high blood pressure (grade 3 ESH); a typical systolic murmur on examination and a weak and delay femoral pulse. Moreover, there are paucity of reported cases of patients first diagnosed with uncorrected aortic coarctation at very late age [3, 8, 9]. A morphological diagnostic imaging is essential to determine the location, characteristics and severity of lesions. Ultrasound diagnosis for aortic coarctation has an accuracy rate of 90.6%, from a study from by Zhenxing Sun and collaborators [10]. In our case echocardiography permitted pose the diagnosis. This case presented a patient with isthmus aortic coarctation which describes some common diagnostic features described in literature and some absent of common features such as: no rib notching and no common associated cardiovascular defects were founded [11, 6]. Whereas, an uncommon abnormality was founded in this case with a duplicated superior vena cava. Patient management consisted of antihypertensive therapy, endocarditis prophylaxis and surgical corrective treatment for coarctation lesions is pending. In accordance to actual protocols [12]. This correction will be through an intravascular stent therapy. Once the stent is positioned across the obstructive lesion, inflating the balloon results in implantation of the stent. The diameter over which the stent is mounted will determine the diameter of the implanted stent [13]. A study demonstrated a procedural success of 97.9% [14]. Nevertheless, are described rare incidence at 1.6% of Aortic wall complications, including dissection or rupture, which may lead to circulatory collapse and death [14]. Multicentre reports showed excellent acute, intermediate and long-term success of stent placing. A report in a cohort of 302 patients showed acute procedural success of 96%, intermediate success of 86% (41% of the patients from the cohort completed follow-up), and long-term success of 77% of patients [15].

## 3. Conclusions

Through this case, we presented a young female with an aortic coarctation fortuitously discovered during the evaluation of an asymptomatic hypertension. The diagnostic was easily obtained during her echocardiographic assessment. Prior to surgical management, Blood pressure controlled was achieved on pharmacological treatment. Due to financial constraint her interventional therapy is pending. The particular aspect in this case was the association of a duplicated superior vena cava.

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## REFERENCES

- [1] Diagnostic and surgical trends, and epidemiology of coarctation of the aorta in a population-based study. V, Grech. 2, 28 Feb 1999, *Int J Cardiol*, Vol. 68, pp. 197-202.
- [2] Asymptomatic severe coarctation in an 80-year-old man. Cevik S, Izgi C, Cevik C. 2004, *Tex Heart Inst J*, pp. 429-431.
- [3] Coarctation of the Aorta, Known Yet Can Be Missed. Asim Al Balushi, Sunny Zacharias, Khalfan Al Senaidi. 3, 2013, *Oman Med J*, Vol. 28, pp. 204-206.
- [4] Warnes CA, Deanfield JE. Congenital heart disease in adults. In: (ed.) Alexander RW. et al. *Hurst's The Heart Volume 2*, 11th edition. New York: McGraw Hill Professional. 2004: 1866.
- [5] Natural history of coarctation of the aorta. M, Campbell. 5, Sep 1970, *Br Heart J*, Vol. 32, pp. 633-640.
- [6] A severe coarctation of aorta in a 52-year-old male: a case report. Cicek D, Haberal C, Ozkan S, Muderrisoglu H. 6, 2010, *Int J Med Sci*, Vol. 7, pp. 340-341.
- [7] Anomalies Associated with Coarctation of Aorta Particular Reference to Infancy. Anton E. Becker, Mies J. Becker, Jesse E. Edwards. 1970, *Circulation*, Vol. 41, pp. 1067-1075.
- [8] Aortic coarctation: a rare and unexpected cause of secondary arterial hypertension in the elderly. Convens C, Vermeersch P, Paelinck B, Van den Heuvel P, Van den Branden F. 1996, *Cathet Cardiovasc Diagn*, Vol. 39, pp. 71-74.
- [9] Highly effective compensatory mechanisms in a 76-year-old man with a coarctation of the aorta. Miro O, Jimenez S, Gonzalez J, De Caralt TM, Ordi J. 1999, *Cardiology*, Vol. 92, pp. 284-286.
- [10] Diagnostic Value of Transthoracic Echocardiography in Patients with Coarctation of Aorta: The Chinese Experience in 53 Patients Studied between 2008 and 2012 in One Major Medical Center. Zhenxing Sun, Tsung O. Cheng, Ling Li, et al. 6, 1 Jun 2015 Jun, *PLoS One*, Vol. 10.
- [11] CT and MRI of Aortic Coarctation: Pre-Postsurgical Findings. Ali D.K, Ranish D.A., Mehmet R.O and Mannudeep K.K. 2015, *American Journal of Roentgenology*, Vol. 204, pp. 244-233.
- [12] Benefits of surgical repair of coarctation of the aorta in patients older than 50 years. Bauer M, Alexi-Meskishvili V, Bauer U. 2001, *Ann Thorac Surg*, Vol. 72, pp. 2060- 2064.

- [13] Transcatheter stent therapy in children: An update. Sahu, P. Syamasundar Rao and Raj. 2012, *Pediat Therapeut*, Vols. S5:001. doi: 10.4172/2161-0665.S5-001.
- [14] Procedural results and acute complications in stenting native and recurrent coarctation of the aorta in patients over 4 years of age: a multi-institutional study. Forbes TJ, Garekar S, Amin Z, Zahn E, Nykanen D, Moore P, et al. 2, 1 Aug 2007, *Catheter Cardiovasc Interv*, Vol. 70, pp. 276-85.
- [15] Stenting of aortic coarctation: acute, intermediate, and long-term results of a prospective multi-institutional registry--Congenital Cardiovascular Interventional Study Consortium (CCISC). Holzer R, Qureshi S, Ghasemi A, Vincent J, Sievert H, Gruenstein D, et al. 4, 1 Oct 2010, *Catheter Cardiovasc Interv*, Vol. 76, pp. 553-63.