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Mini Review

Review of Coarctation of Aorta

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Abstract

Coarctation of the aorta is a narrowing of the descending aorta that occurs in relation to the site of the ductus arteriosus. This relationship is either preductal or post ductal. The age of presentation as well as, the clinical findings vary according to the degree of narrowing of the descending aorta. While tight coarctation presents early in neonatal period, mild coarctation usually presents later on life. Echocardiographic diagnosis depends on visualization of the narrowed segment and the characteristic Doppler findings. Management depends on the age of the patient and the site of narrowing.

Keywords: *Coarctation; Aorta*

It is a mini review which gives concise knowledge about coarctation of the aorta. Furthermore, it contains echocardiography images which depict the pathognomonic signs for the diagnosis.

Coarctation of the aorta is a narrowing of the descending aorta that occurs in relation to the site of the ductus arteriosus. This relationship is either preductal or postductal.

Coarctation may occur either as a localized constriction of the aorta (discrete) or as tubular hypoplasia of the aortic arch and proximal descending aorta.

Presentation

The age of presentation depends on the degree of narrowing of the arch:

- **Tight coarctation:** Usually presented in neonatal period after the closure of the PDA, with signs and symptoms of acute heart failure, sometimes severe shock which may lead to death if left untreated.
- **Mild coarctation:** May presented late in infancy, childhood or even adulthood with headache from hypertension as well as systolic or continuous murmur at the back, due to development of collaterals.

Clinical findings

In Neonates, the most important clinical finding is weak or absent femoral pulse, presence of blood pressure difference between the right upper and any of the lower limbs, provided that the proper cuff is used. If the blood pressure is higher in the arms than in the legs by 20 mmHg or more, the difference is considered significant. Recently, right upper limb and lower limb saturation recording was approved as a screening tool for neonates before discharge after delivery. The presence of LL saturation less than 96% or a difference between right upper limb and any of the lower limbs saturation more than 3% is considered an indication of urgent echocardiography.

In older children: The examination of the heart may reveal cardiac enlargement. Palpation in the suprasternal notch reveals a prominent aortic pulsation and perhaps a thrill in patients with a coexistent bicuspid aortic valve. An ejection-type murmur is present along the sternal border, at the apex, and over the back between the left scapulae and the spine in the fourth interspace. The murmur is generally grade 2/6 - 3/6.

Investigations

Chest x ray

- **In symptomatic infants:** Cardiomegaly and the lung fields show pulmonary venous congestion.
- **In older children:** Cardiac size and pulmonary vasculature are usually normal Rib notching may be apparent in older children and adolescents, but its absence does not rule out the diagnosis of coarctation. The inferior margins of the upper ribs show scalloping caused by pressure from enlarged and tortuous intercostal arteries serving as collaterals.

ECG

In the neonatal and early infancy periods, the electrocardiogram usually reveals right ventricular hypertrophy. While it shows left ventricular hypertrophy in older children.

Echocardiography

Suprasternal notch view reveals narrowing at the site of coarctation with posterior projection causing the narrowing called posterior shelf.

Color Doppler shows a turbulent signal at the stenosis. Doppler shows high-velocity flow from the transverse aortic arch to the descending aorta with a continuous pattern extending from systole into diastole (diastolic tail).

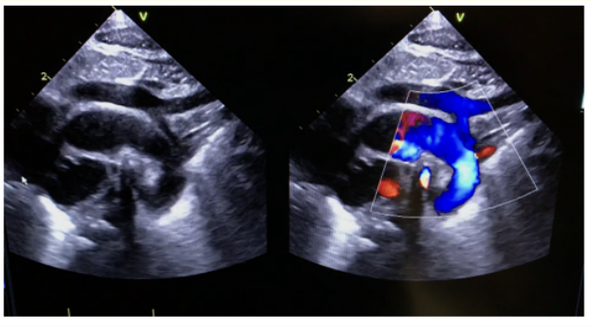

Figure 1: *Severe hypoplasia of the aortic arch between second and third branch in few hours old neonate. Large PDA is seen connecting the main pulmonary artery and the descending aorta (ductal arch).*

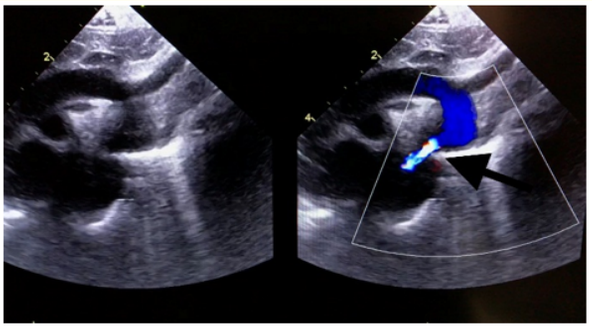

Figure 2: *Tight discrete coarctation with prominent posterior shelf (arrow).*

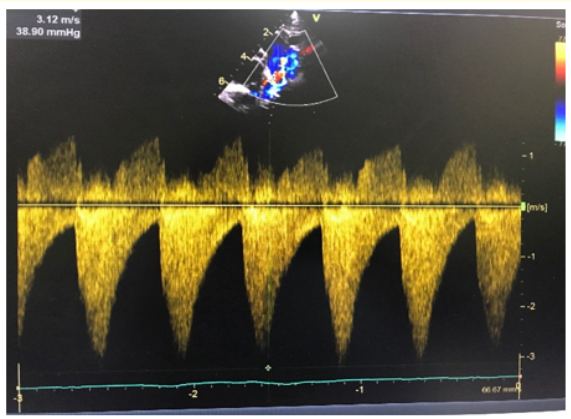

Figure 3: *Diastolic tail.*

Management

Immediate prostaglandin infusion for neonates with suspected coarctation, and after confirmation of the diagnosis till surgery.

Surgery

Excision and end-to-end anastomosis. A discrete coarctation is excised and the two ends of the aorta are reanastomosed. An elliptical incision is made to minimize narrowing that may accompany growth of the patient and/or shrinkage of the anastomotic scar.

Interventional catheterization

Balloon dilatation of native coarctation has been successful for patients above 6 months of age. However, there is incidence of aneurysm formation later.

Balloon dilatation of restenosis after surgical repair is more successful with less incidence of aneurysm formation.

Transcatheter Stent Implantation

Considered the treatment of choice for adolescents and adults, Children around the weight of 30 kg can benefit from stent provided that it will require dilatation as they grow. Using covered stent showed low risk of complications such as aneurysm formation [1-15].

Conclusion

Clinical presentation and management of coarctation differs according to age of the patient. Tight coarctation tends to present in neonatal period and early infancy with heart failure. While, mild coarctation tends to present late usually with hypertension. Furthermore, Surgery is the management of choice for native coarctation presented early in life. Whereas, trans catheter stent implantation can be used in older children and adolescents.

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