PERCUTANEOUS RECANALIZATION OF AORTIC ISTHMUS ATRESIA USING KISSING TECHNIQUE AND COVERED STENT IN AN ADULT PATIENT
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HISTORY AND PHYSICAL
A 23-year-old female with recently diagnosed severe CoA was referred to us with history of refractory hypertension and shortness of breath (NYHA II) of four months duration. On physical examination, the blood pressure in the right upper limb was 220/110 mm Hg. The patient received three types of antihypertensive with poor control of blood pressure. A radio-femoral delay was apparent and a pressure gradient of 100 mm Hg was noted between the upper and lower extremities. The pulsations in the lower limbs were faint. Routine blood chemistry and urine analysis were within normal values. A chest x-ray delineated rib notching. A 2-D echocardiogram revealed concentric left ventricular hypertrophy, normal aortic valve without obstruction or regurgitation and suspicion of coarctation of aorta with complete atresia of isthmus with no detectable turbulence by color Doppler or significant gradient by continuous wave Doppler. Pulsed wave Doppler revealed loss of pulsatility of abdominal aorta. A poor quality of contrast CT angiogram was done that was not helpful.

INDICATION OF INTERVENTION
As the patient has severe hypertension that not relieved by combined antihypertensive drugs. To avoid complications of severe hypertension like intracranial hemorrhage.

INTERVENTION
The procedure was performed under general anesthesia first using the retrograde transfemoral approach. Administration of antibiotic prophylaxis and intravenous heparin at 100 mg/kg to maintain an activated clotting time of > 250 ms throughout the procedure is recommended. During vascular access, we ensured that we entered the femoral artery at the level of the femoral head to avoid artery injury if arterial approach was done at level of superficial femoral artery. Immediately upon entry with the arterial sheath, an angiography in descending aorta was done with failure to cross the coarctation segment to ascending aorta.

A decision was made to proceed the procedure using (Kissing technique) via right transradial approach, first angiography was done by pig tail catheter in ascending aorta which revealed a blind stump of coarctation segment and massive collaterals. First, trying to cross atretic segment using guiding Judkin right catheter 6Fr, PTCA Moderate support guide wire (Boston Scientific) and small coronary balloon 2x20mm but no progress of guide wire. Multiple hand injections were done distally through Judkin right catheter to be ensure that the distal and cephalic segment of atretic coarctation were positioned in the same plane .Then a straight Terumo wire was manipulated through the distal part of the aorta, then the wire passed through the atretic lumen of the aorta . The ascending aorta angiogram confirmed the absence of any resultant vascular complication. Therefore, we proceeded further for dilation of atretic segment by PT2wire and coronary balloon 2x20mm
(SeQuent NEOB/BRAUN). A Terumo wire 0.035x260 passed through the atretic segment from transradial approach, then it was snared from the femoral artery.

A pig tail was advanced over Terumo wire and manipulated to ascending aorta, then replaced by super-stiff wire (St. Jude Medical, St. Paul, MN) wire. 12 F Mullin sheath was advanced over the super stiff wire to ascending aorta.

The distance from left subclavian artery through the isthmus was 34mm, the diameter of transverse arch was 18mm. A 39 mm PTFE covered Cheatham-Platinum stent (NuMED Inc., Hopkinton, New York) mounted on 16x40mmZ-Med balloon (Numed Canada Inc., ON, Canada) was positioned successfully at the coarctation. For optimal stent positioning, we maintained the delivery sheath just beyond the proximal part of the stent slowly expanded the distal stent to its full size (Fig 3). We then pull the sheath far away from the balloon catheter and deployed the remainder of the stent across the coarctation segment.

Following stent deployment, MP2 catheter was used for obtaining pressure pull back through stent. Multiple angiograms were done by Pigtail catheter just above the stent and in ascending aorta in many views to show the position of stent. No gradient found by pull back catheter through the stent. Hemostasis was achieved manually as Perclose device was not available. Aspirin is prescribed in a dose 5mg/Kg for six months. Only one type of antihypertensive described for the patient with good control of blood pressure.

**LEARNING POINTS OF THE PROCEDURE**

We described successful perforation of complete atresia of aortic isthmus in an adult patient using the stiff end of Terumo wire by kissing technique in case of unavailable Radiofrequency. To avoid complications and increase efficacy implantation of CP covered stent was used.

![Angiography in the descending aorta in the anteriosuperior (AP) view showing complete atresia of the aortic isthmus](image.jpg)
aortic isthmus; Right upper: AP view showing the straight end of Terumo guidewire that has perforated the atretic area.

Fig2. Angiography in descending aorta in anteroposterior (AP) view showing recanalization of atretic segment without vascular trauma. After dilatation with a 2x20mm coronary angioplasty balloon.
Fig 3. AP view showing inflation of distal part of stent across the atretic segment.

Fig. 4. AP angiography through the pig tail catheter above the stent showing well positioned stent without complication.