Egyptian Society of CARDIOLOGY

45TH

45th Annual International Congress of the
EGYPTIAN SOCIETY OF CARDIOLOGY
CardioEgypt 2018

Coarctation angioplasty and stenting step by step

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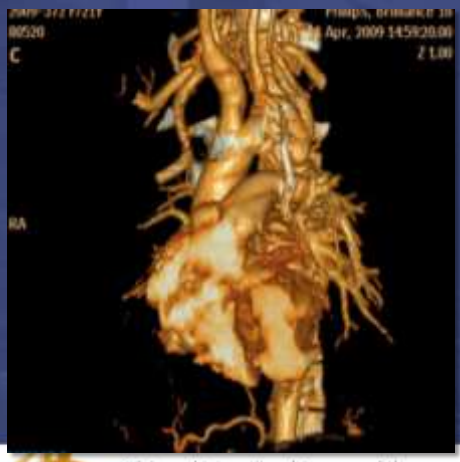
- Coarctation of Aorta accounts for approximately 7% of all congenital cardiac defects, with high occurrence in males
- Associated arch hypoplasia is common
- Associated lesions : bicuspid aortic valve, PDA, VSD, anomalous right subclavian artery

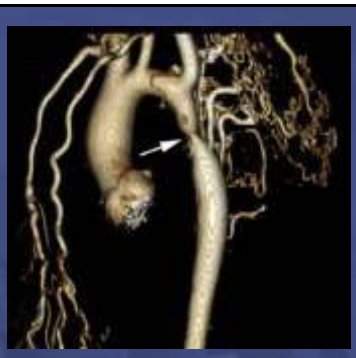
Diagnosis and patient selection

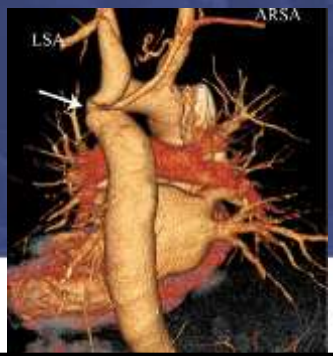
- Clinical examination
- Echocardiography
- MSCT
- MRI

Echocardiography

MSCT







Indications of Balloon Angioplasty/ stenting

Balloon Angioplasty

- Neonatal period and/ Or first 6 months of life in case of poor LV systolic function, sepsis, hemorrhage
- Discrete coarctation whether native or S/P surgery < 15 Kg
- Children below 6-8 years
- Adults with favorable anatomy.

Stenting

- Native or s/p surgery - weight > 15-20 Kg
- Long segment coarctation
- Associated hypoplasia of isthmus and/or aortic arch
- Tortuous coarctation
- Recurrent after surgery or aneurysm following prior balloon or surgery

Equipment – neonates and children

- 4-5F introducer
- Multipurpose, pigtail, JR
- 0.018,0.025,0.035 GW
- Tyshak mini in neonatal period
- Older children – Tyshak II, Opta, Z-med, Powerflex

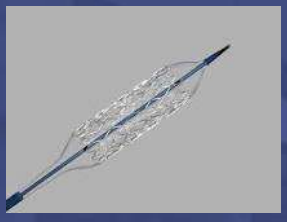
Tyshak mini Double Tapered Balloon

- Super thin for a low deflated profile that maintains tip flexibility.
- Exceptionally low profile
- Requires the smallest introducer possible.

Tyshak, TyshakII

- Coaxially constructed catheter with a distally mounted non-compliant balloon.
- Extremely low profile.
- Due to the coaxial construction, the catheter inflates and deflates extremely fast.

Stents for neonates and small children



Formula Balloon expandable stent
Cook

- Open cell
- Low crossing profile
- No shortening
- 5-10mm can be redilated
- 4-5F flexor sheath – 6F coronary guide cath

VALEO Balloon expandable stent
BARD

- Uniquely flexible stent
- Competitive radial strength with minimal recoil
- 6-10mm can be redilated - forshortens
- 6-7F sheath – 7F coronary guide cath

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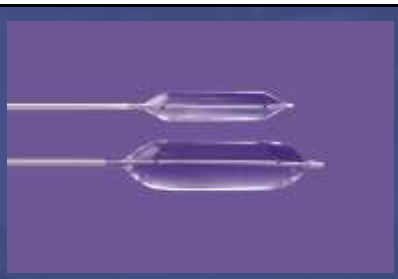
Equipment - Stenting

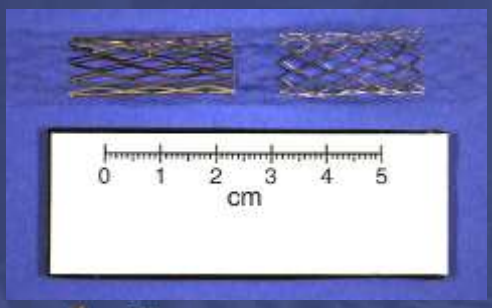


The **Z-MED™** high pressure dilatation catheter is a coaxially constructed catheter with a distally mounted non-compliant high pressure balloon.

BIB balloon
An inner balloon 1/2 of the balloon diameter of the outer balloon, 1cmm shorter and has a burst pressure of 45.5atm.

Equipment

Palmaz and Genesis Stents



- Balloon expandable stainless steal.
- Closed cell design which gives them high radial strength but makes them less flexible.
- Hand mounted and crimped on the delivery balloon.

Equipment

CP Stent™

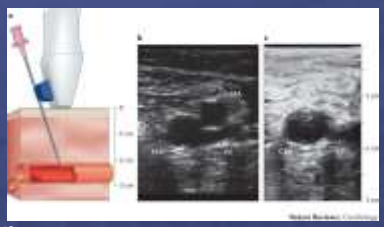
- Composed of 0.013" platinum/iridium wire that is arranged in a "zig" pattern, laser welded at each joint and then over brazed with 24K gold.
- It allows expansion from 12.0mm to 24.0mm.

The **Covered CP Stent™** is comprised of the Bare CP Stent that is covered with an expandable sleeve of ePTFE.

Hand crimped or balloon mounted

Balloon Angioplasty – step by step

- Femoral artery access – 18G needle or 19G scalp
  - Anatomic or ultrasound guided
- <10kgs 3-4F sheath
- Heparin 100 units/kg
- Crossing Multipurpose catheter or JR
- PTCA wires (hydrophilic)
- Pressure gradient and Angiography – pigtail catheter
- Balloon positioning – inflation
- Final Pressure gradient and angiogram
- Hemostasis to avoid complications



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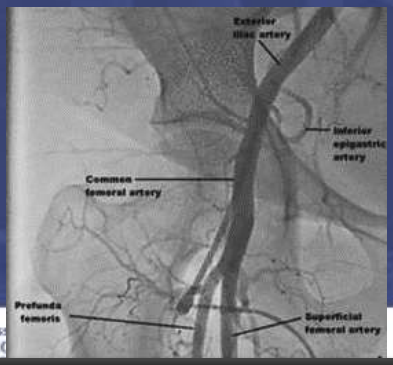
Femoral artery access

- The bifurcation of the CFA occurs in zones 2, 3, 4 and 5, 1%, 9%, 43% and 47% of the time, respectively
- Occurs within the lower third of the femoral head or below the lower border of the femoral head in 90% of patients

A 18 G needle could be ideal
Puncture the skin at zone 5 inferior border of head of femur. Enter the artery at mid point in the Zone 3.
The chances of hitting the femoral artery is near 95 %

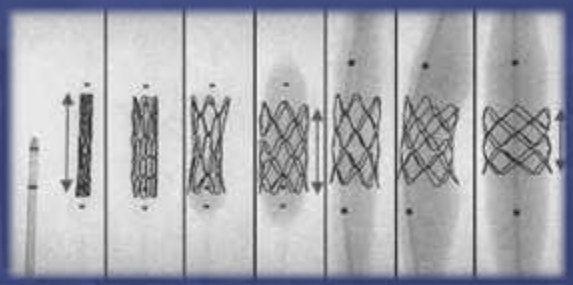


Cardiovascular Intervention and Therapeutics January 2014, Volume 29, 18-23 Madjid Chinikar

Step by Step Stenting

- Femoral artery access – heparin 100U/KG – ACT > 200
- Angiogram in descending aorta
- Crossing the coarctation
- Angiogram above coarctation – measurements
- Crossing with the stiff wire
- Long mullins sheath [size depending on balloon and stent used]
- Preparing balloon and crimping the stent
- Confirming position
- Stent deployment
- Withdrawing the balloon inside sheath
- Final pressure gradient and angiogram

Size of balloon and stent

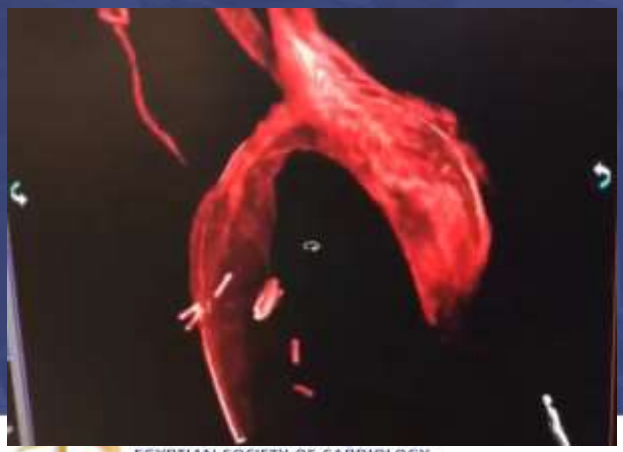


Long sheath

Preparing balloon

Crimping the stent

Stent positioning - Rotational angio



In conclusion

- Balloon angioplasty in children, and stent deployment in adolescents and adults are considered the standard of care
- The anatomy of the coarcted aortic segment and the aortic arch would greatly influence the method of therapy in a given patient.
- Depending on the experience of the center most coarctations can be treated in the cath lab with only cases with very complex anatomy to be referred to surgery

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November 30 – December 1, 2018

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http://www.csi-congress.org/csi-africa.php