



# Coarctation: Will there still be a need for Surgery in the Future?



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“A chance to cut is a chance to Cure”  
“Nothing heals like cold Steel”



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# Disclosures

- None
- Except I am a surgeon

# Back-Up

- Can facilitate a bolder, potentially more complete procedure
  - “don’t worry I got your back”
- Planned ECMO or bypass support for anticipated hemodynamic instability
- Planned surgical procedure if transcatheter option not possible

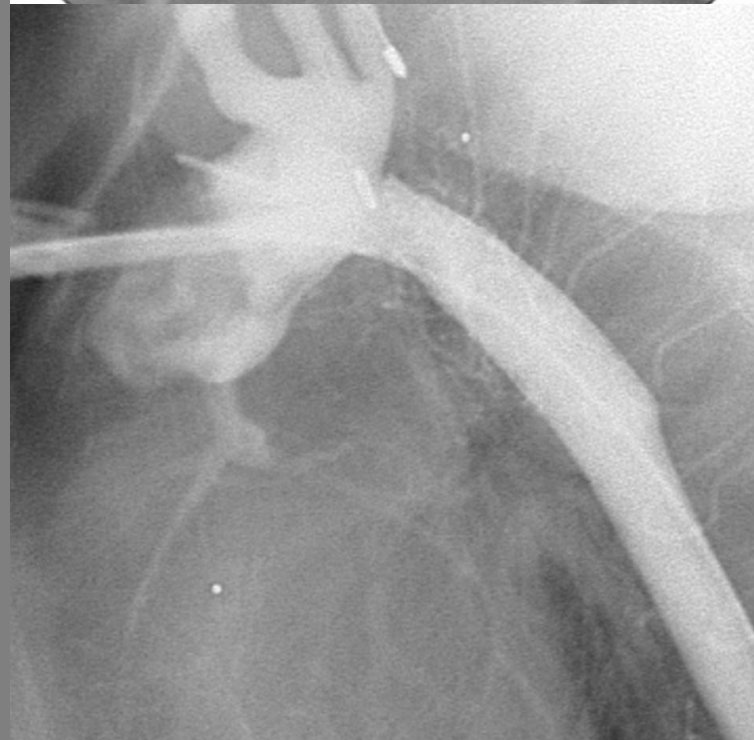
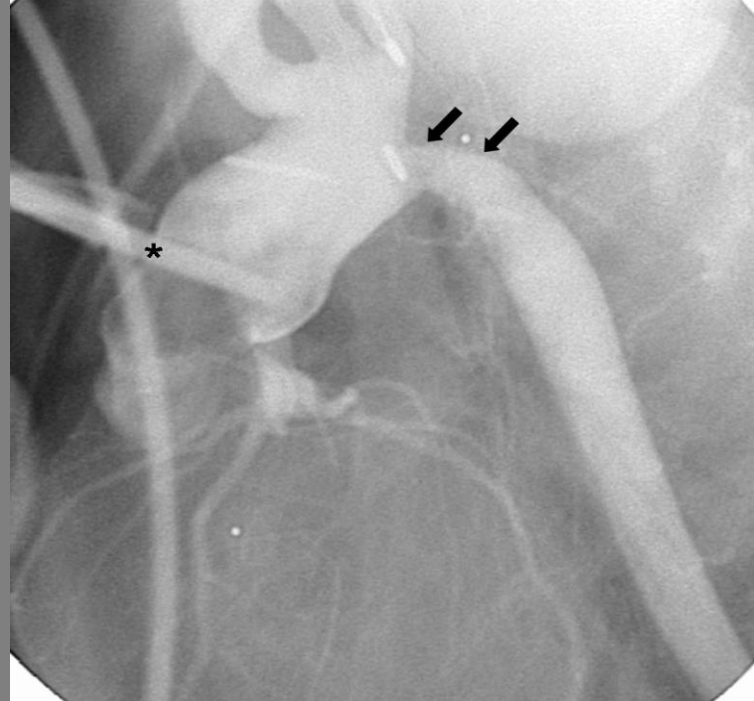
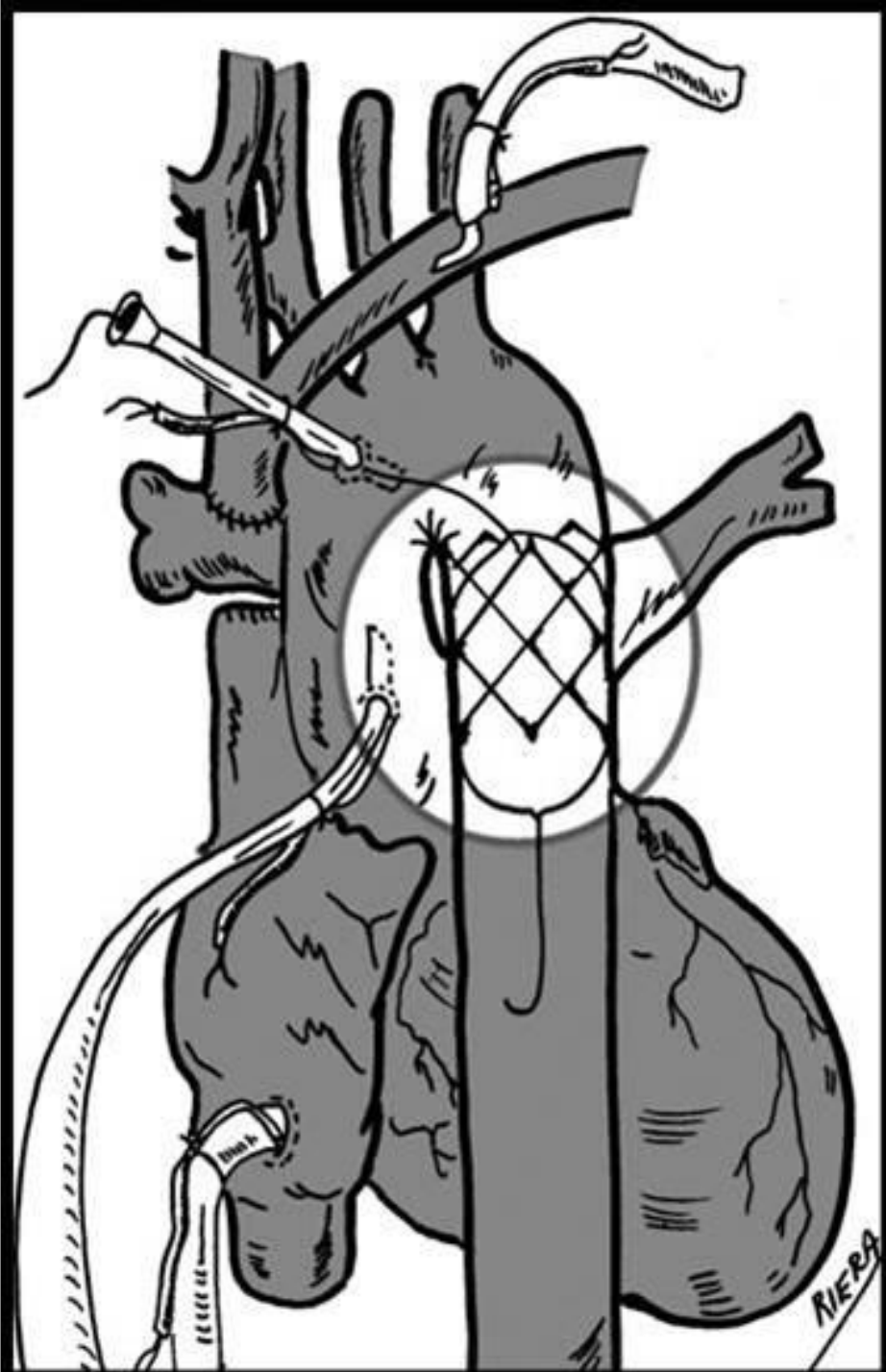


# Making Covered Stents



# Access

- Cutdown
  - carotid, femoral, etc
- Per-ventricular
  - RV via subxiphoid, LV via mini-thoracotomy
- Trans-thoracic
- Hybrid Approach
  - Via ascending aorta sheath

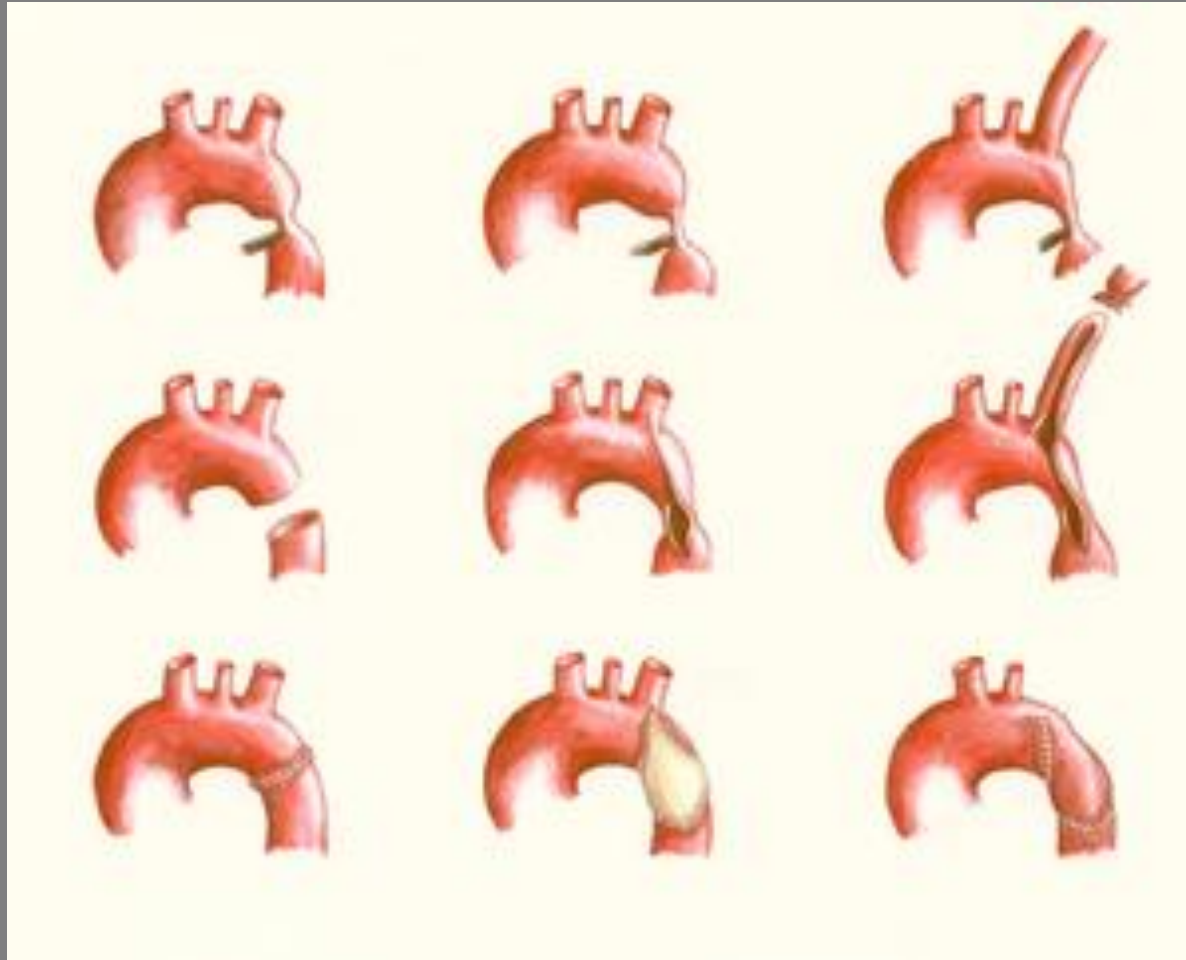


# Coarctation Repair Goals

- Complete relief of obstruction
- Return to normal anatomy & physiology
- Durable, life-long repair
- Low risk, short & long-term
- Low cost, short & long-term



# Surgical Techniques

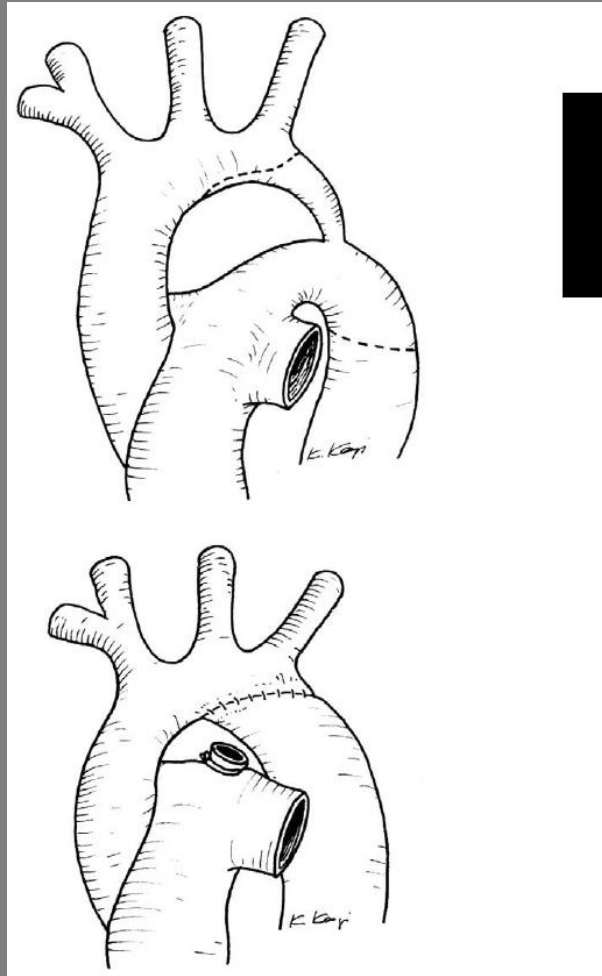


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# Extended End to End Repair

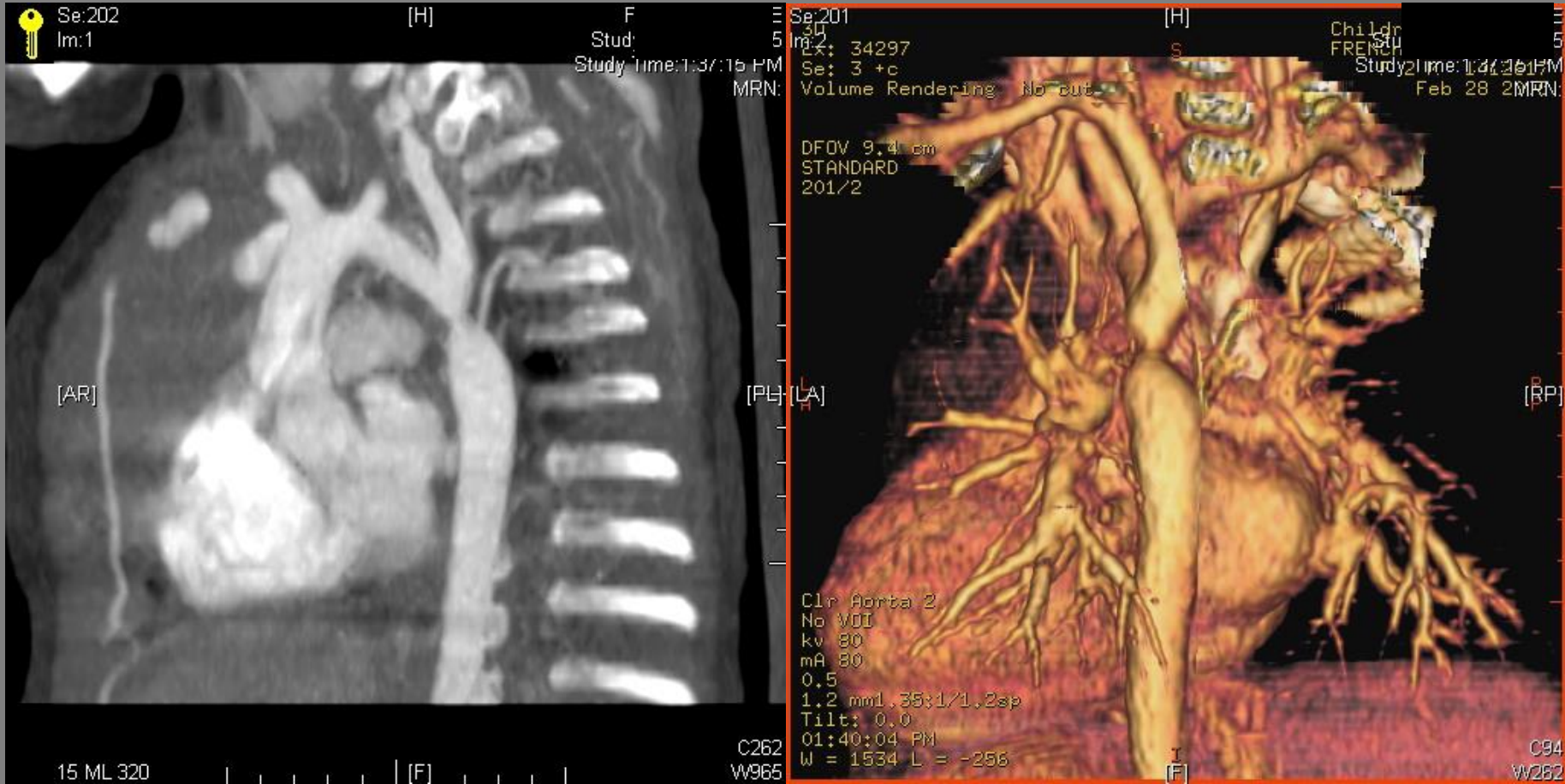


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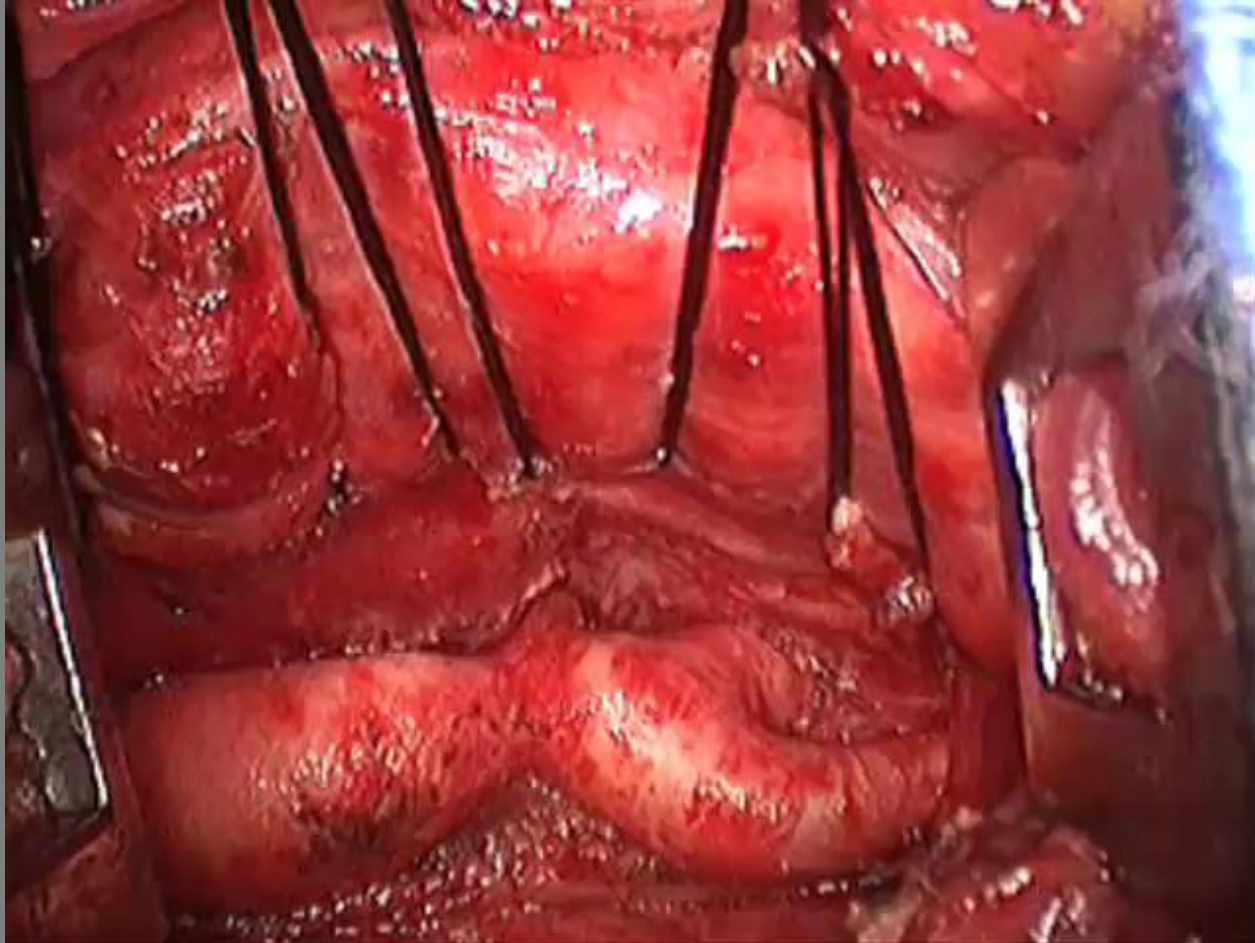
# 2 y/o coarctation



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# Optimum Outcome



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# Surgical Results

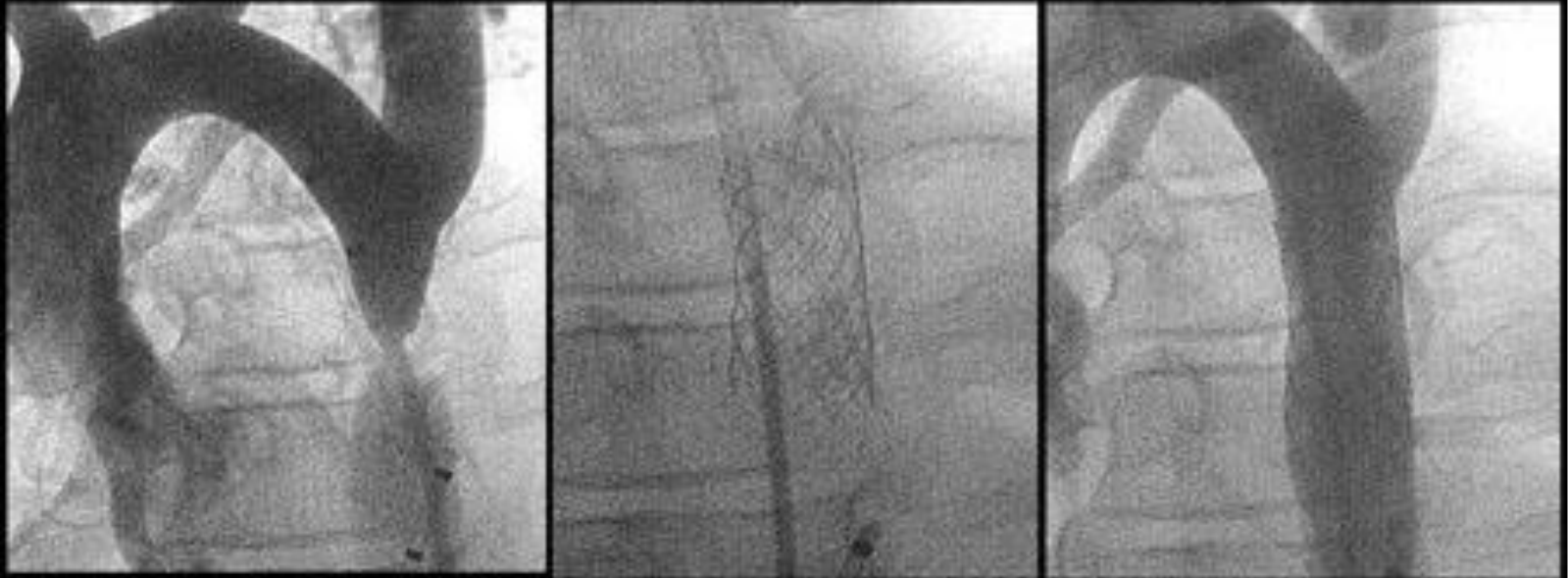
- Mortality 0-3%
- Recoarctation
  - 3-10% for repairs in infancy
  - 0-4% for repairs after 2 years old

Serfontein, et al, Seminars in CT Surgery, 2002



# Coarctation Stent Implantation

▶ 12-year-old with hypertension



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# Adult Coarctation

- Risk-Benefit favors stent therapy
- What's bad for surgeons
  - Depth of chest, visualization, vascular control, collaterals, paralysis, pain control
- What's good for interventional cardiologist
  - Tissue turgor, typically redo, scarred in, distance from major branches, quick recovery

# Adult Coarctation

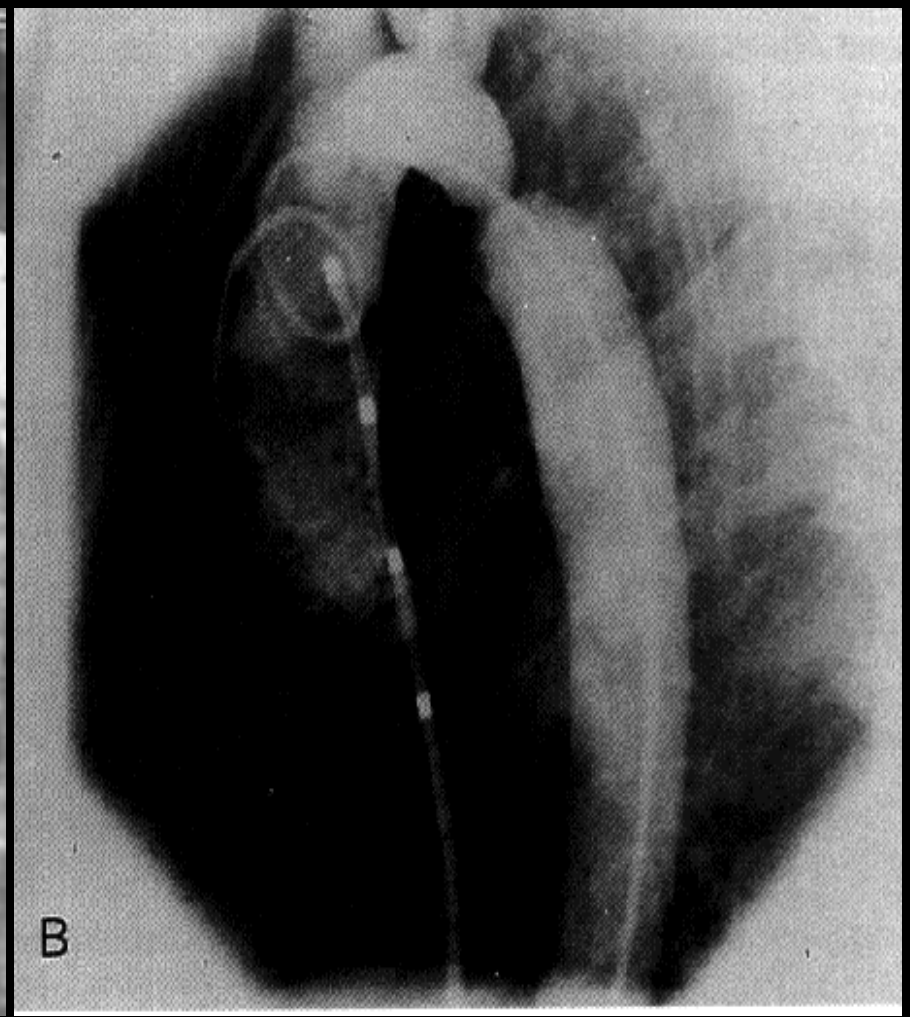
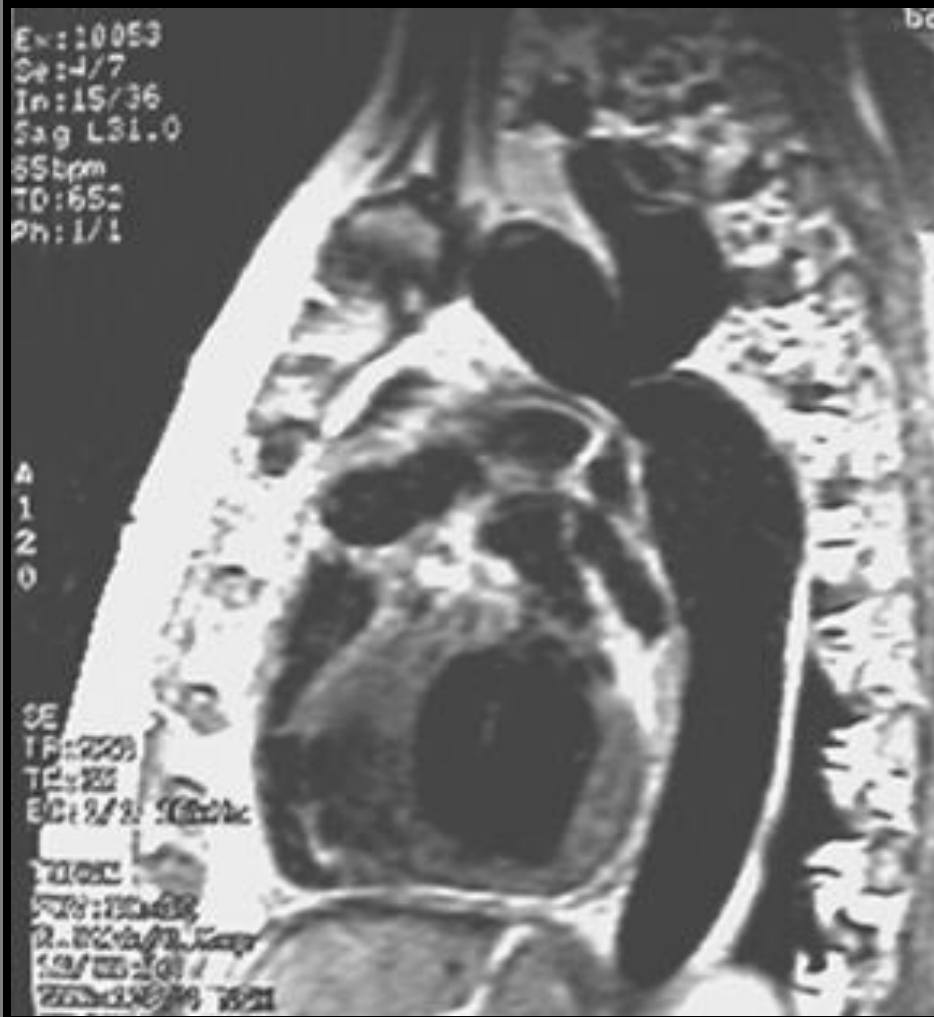


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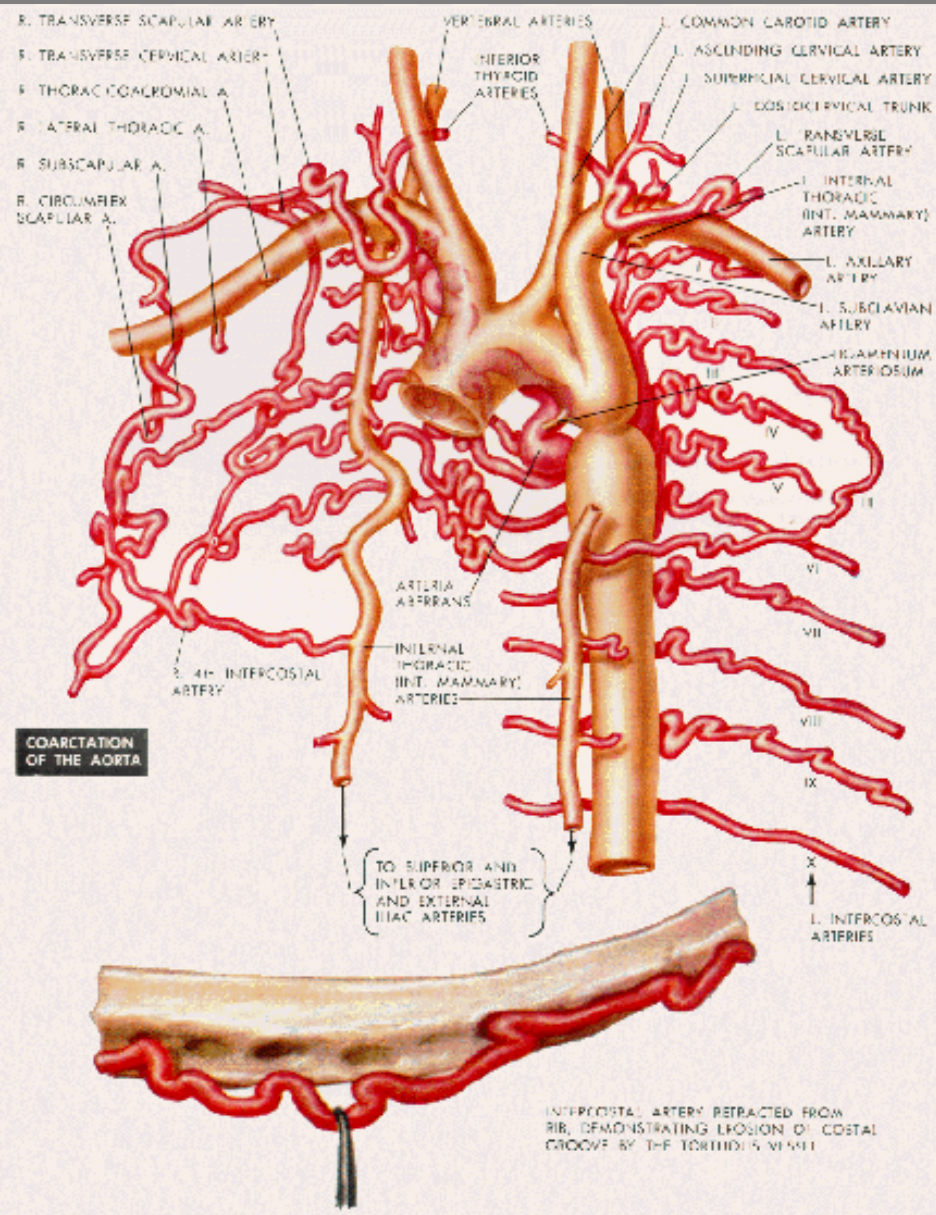
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# Adult Coarctation of the Aorta

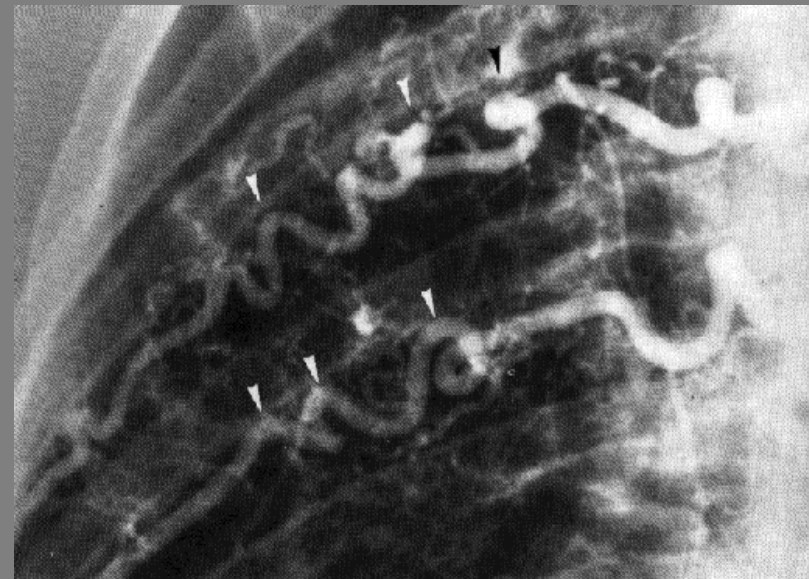
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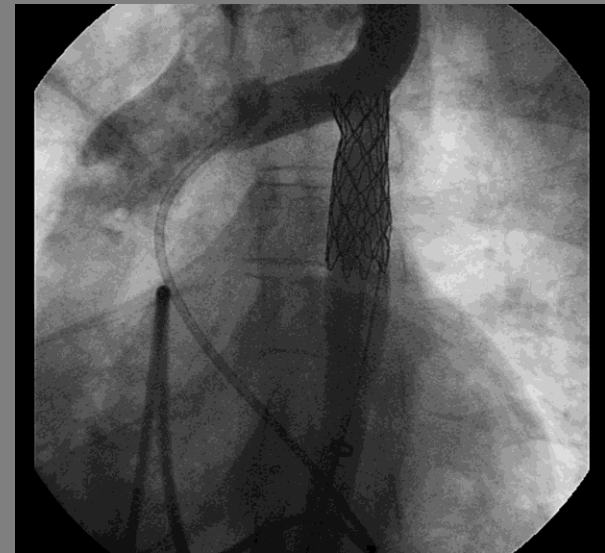
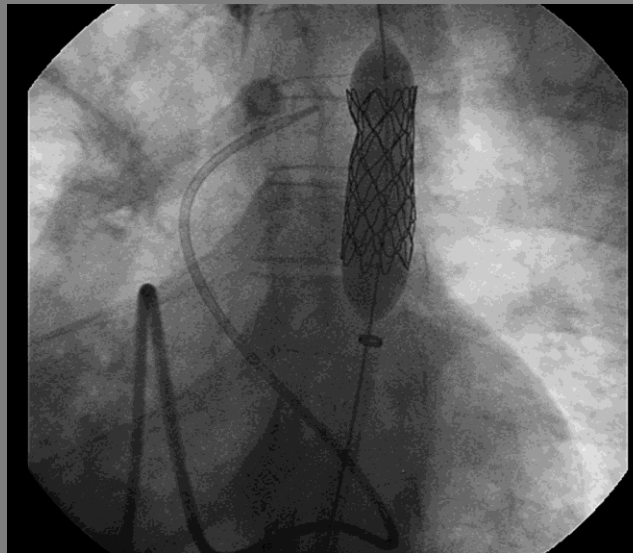
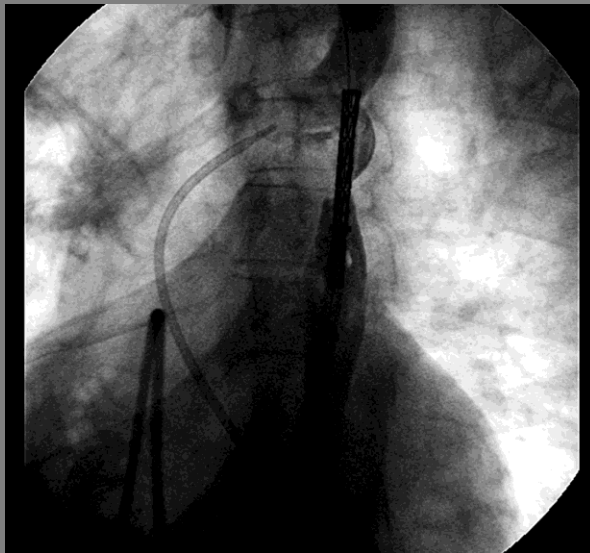
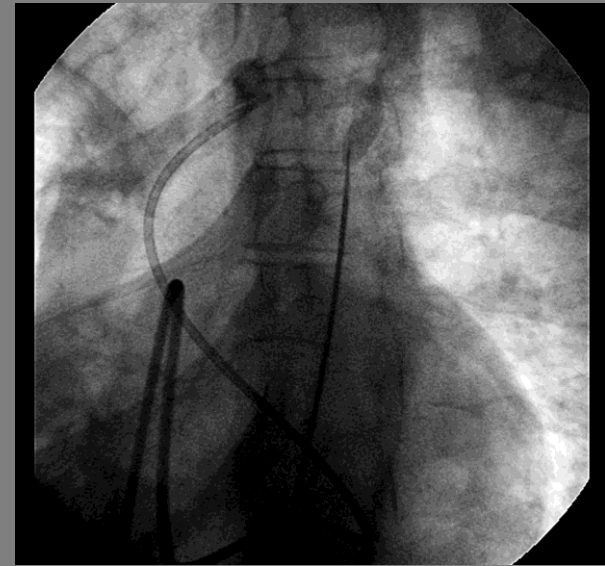
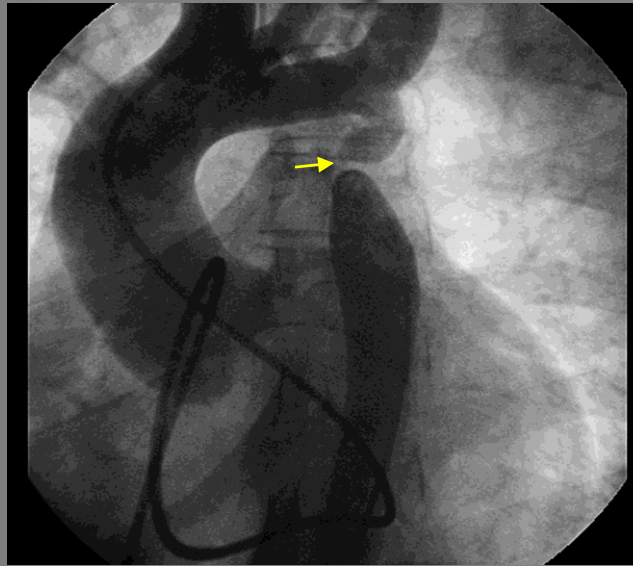
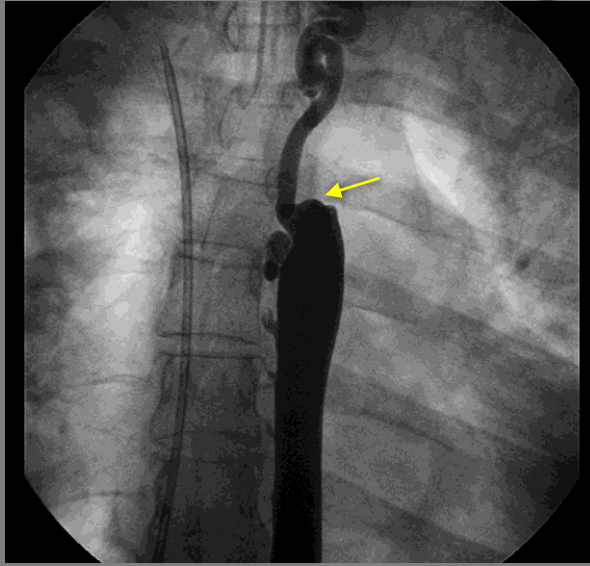
## Collateral Vessels Lead to Rib Notching





# 35 y/o with severe CoA and complete interruption

## Rx: Transseptal delivery of Covered CP Stent



# Newborn Coarctation

- Risk-Benefit favors surgical therapy
- What's bad for interventional cardiologists
  - Safe access, sheath/stent sizes, ability to “grow” stent to adult size, tissue turgor
- What's good for surgeons
  - Easy access, tissue mobility, repair options, very low mortality/morbidity

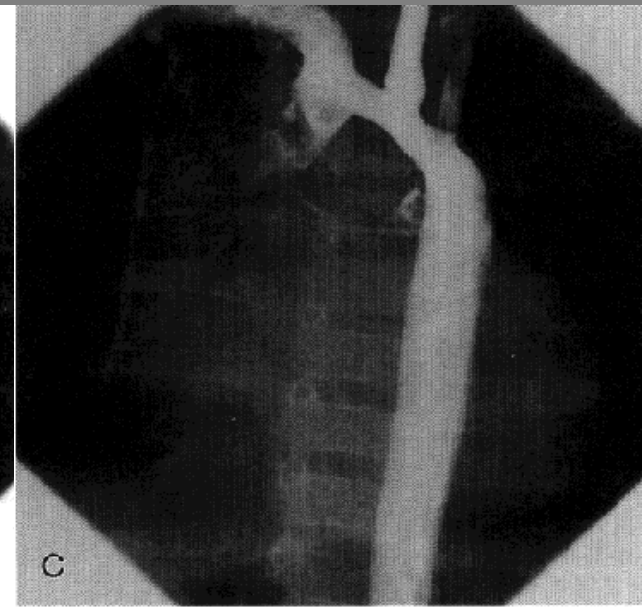
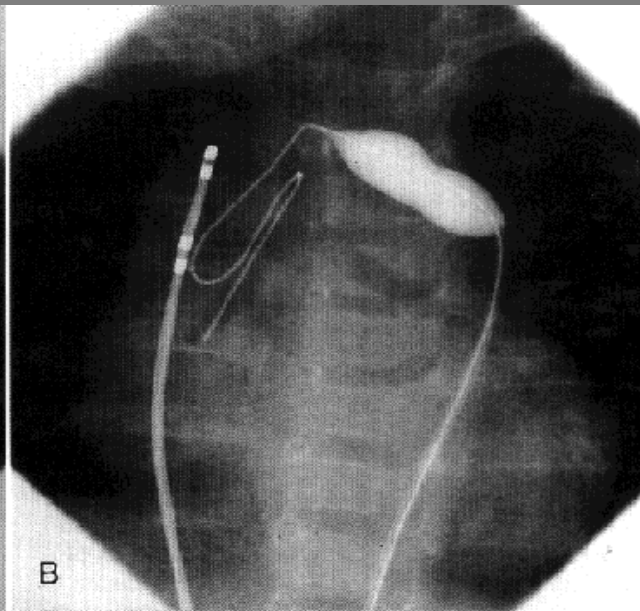
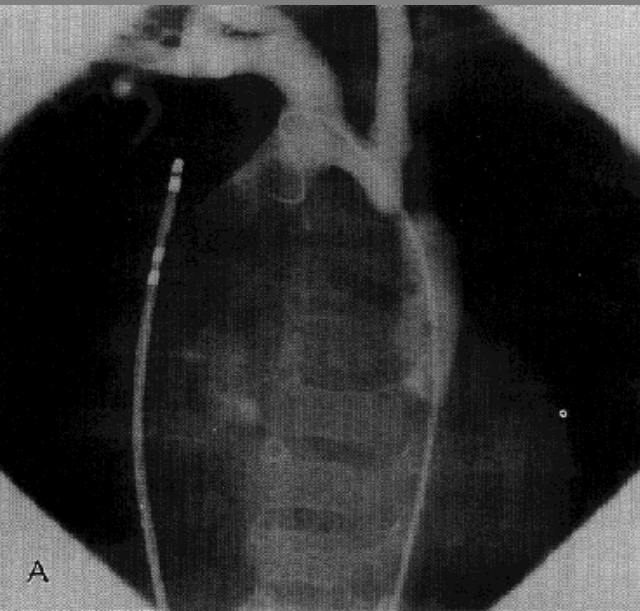
# Balloon Angioplasty

Ann Vasc Surg. 2014 Feb;28(2):394-403. doi: 10.1016/j.avsg.2013.02.026. Epub 2013 Nov 5.

## Outcomes of surgical versus balloon angioplasty treatment for native coarctation of the aorta: a meta-analysis.

Hu ZP<sup>1</sup>, Wang ZW<sup>2</sup>, Dai XF<sup>3</sup>, Zhan BT<sup>4</sup>, Ren W<sup>3</sup>, Li LC<sup>3</sup>, Zhang H<sup>3</sup>, Ren ZL<sup>3</sup>.

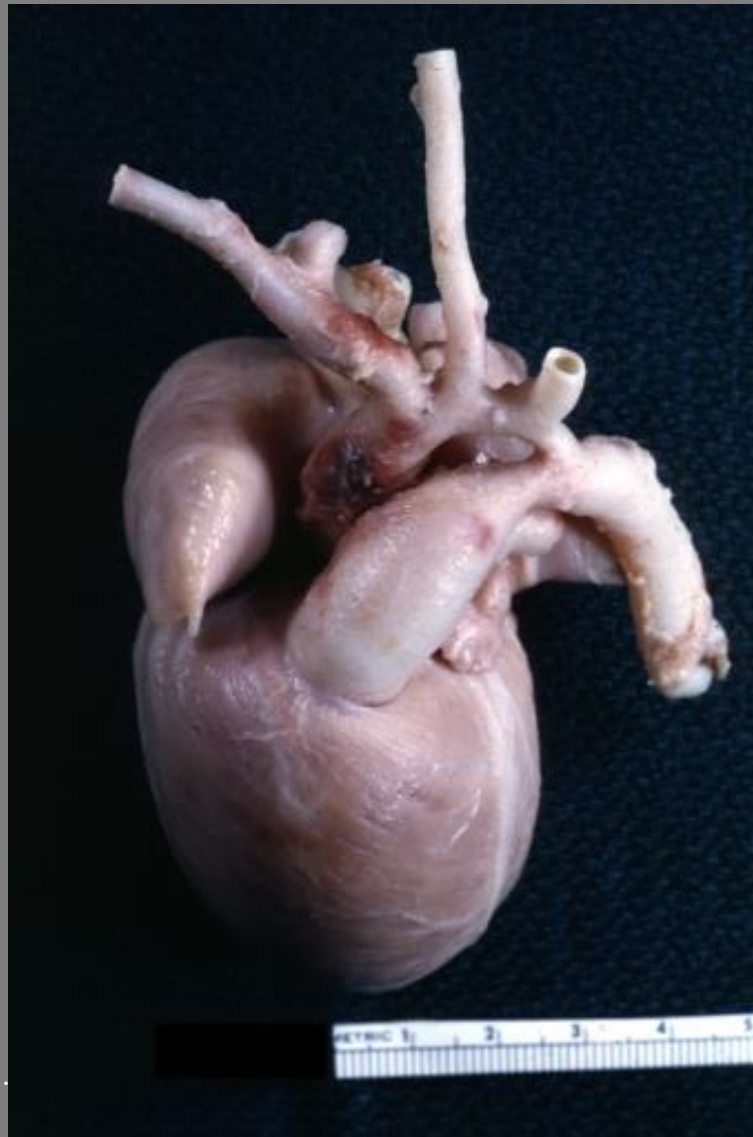
**CONCLUSIONS:** BA provides immediate results comparable to surgery and reduces invasion, but it does not provide better results compared with surgery when considering medium- and long-term complications and even increases the incidence of aneurysm formation.



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# Newborn Coarctation



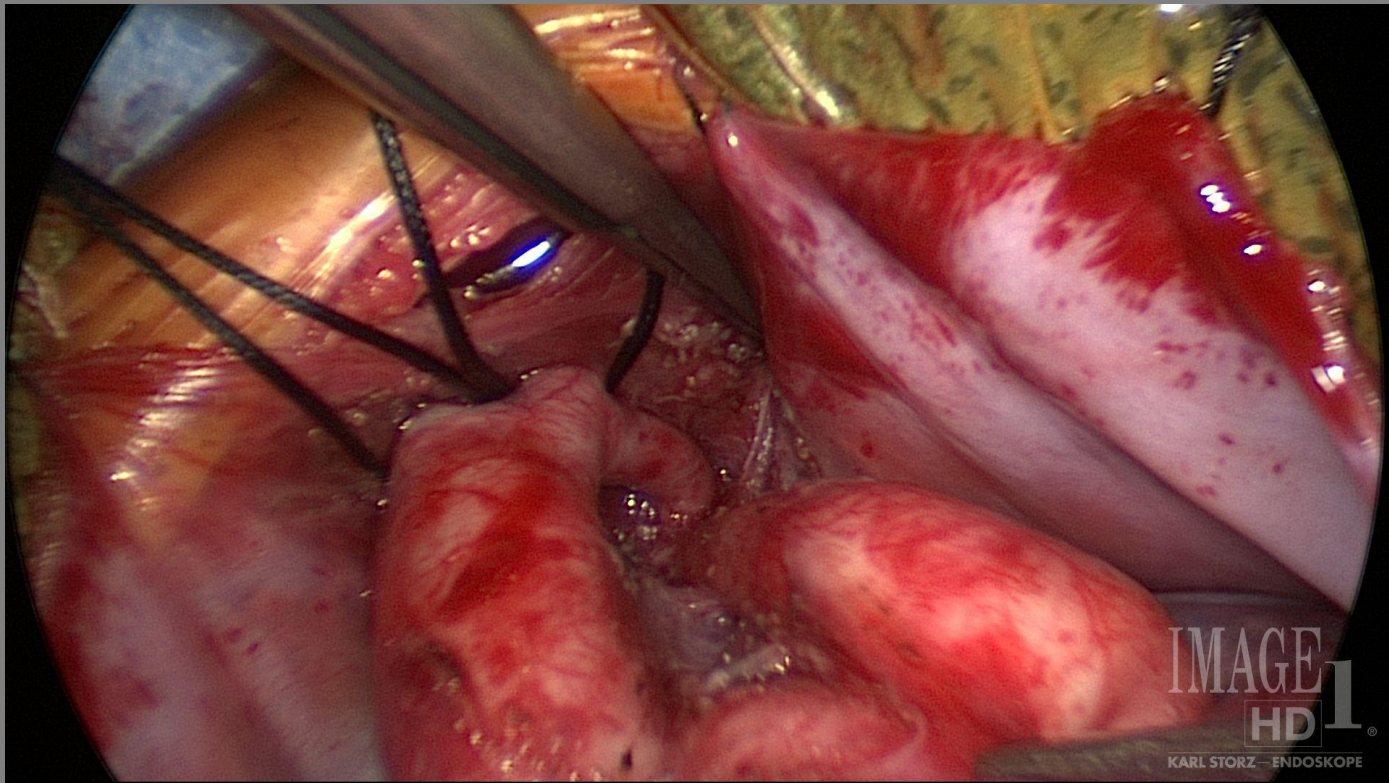
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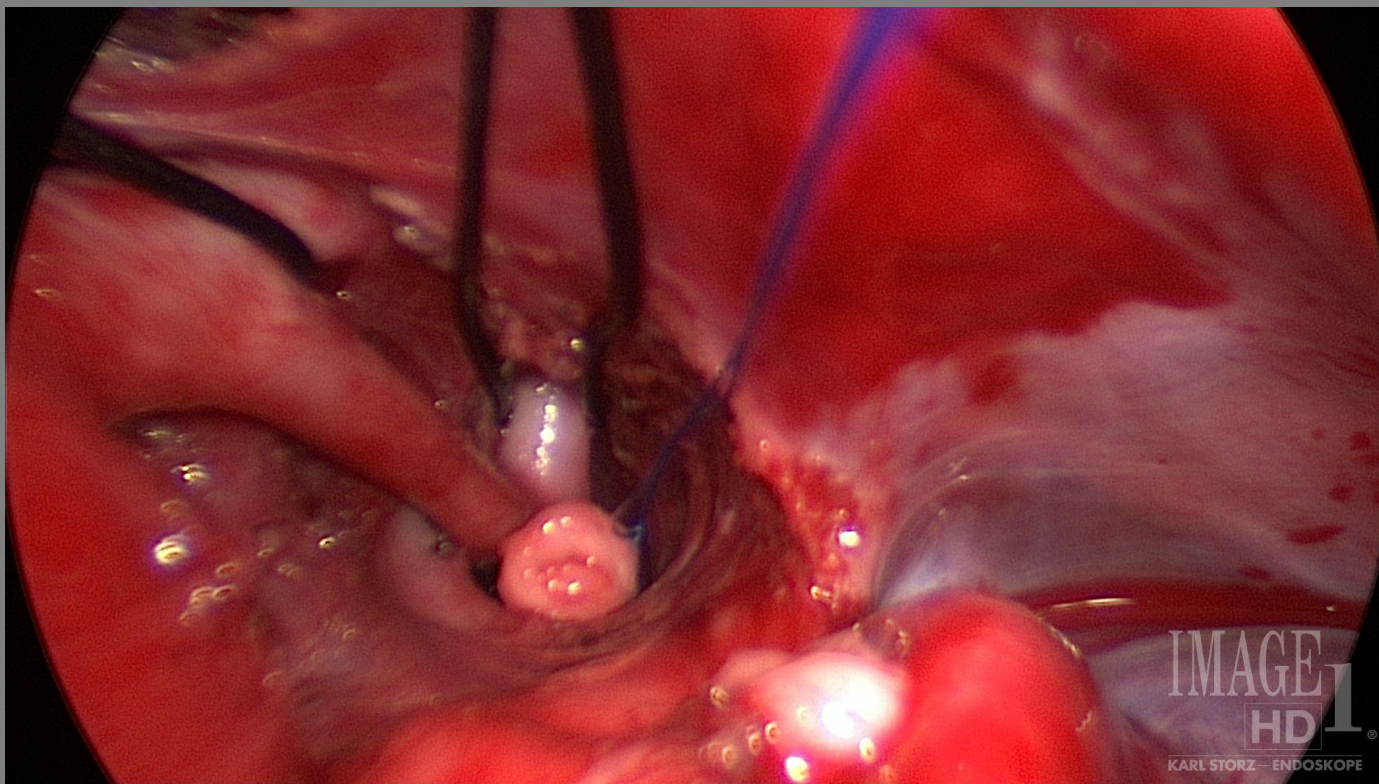
# Newborn Coarctation



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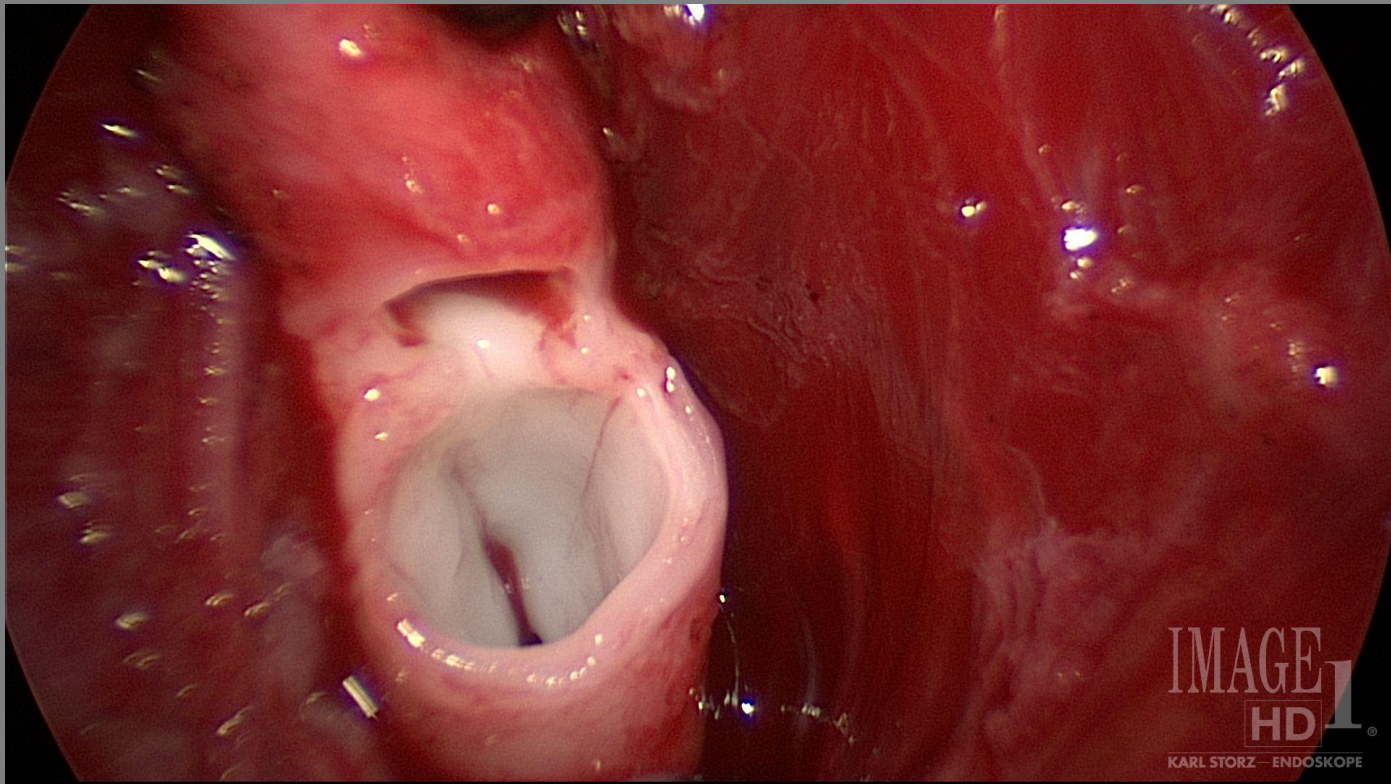
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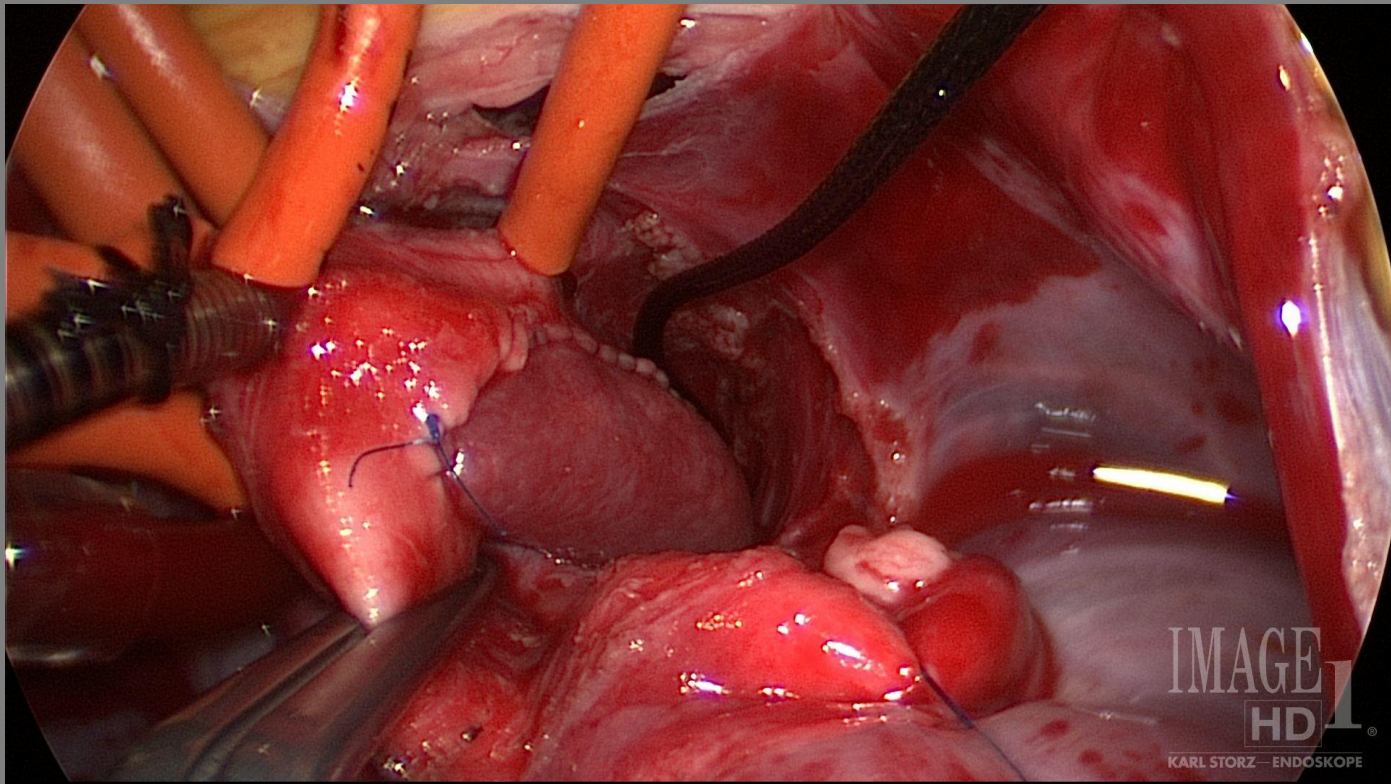
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# Coarct specimen



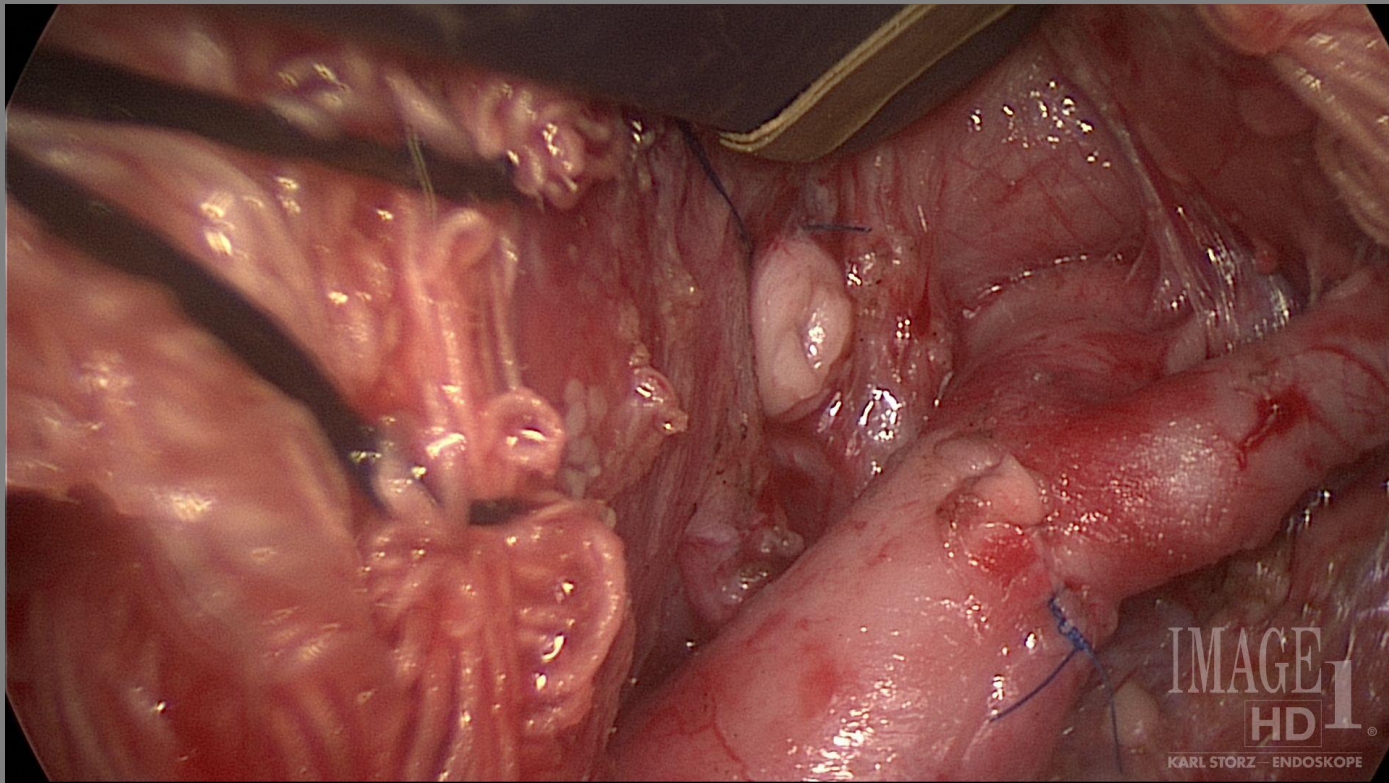
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# Extended End to End



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# Conclusions

- Anatomic and pathologic variability dictates optimum therapy, surgery vs cath
- Typical adult coarctation repair favors a transcatheter approach
- Typical neonatal coarctation repair favors a surgical approach
- Face it you will always need a surgeon in the future
  - Listen to your panel of experts

# Like a Surgeon



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