5th Annual Exam Orientated Echocardiography Course 2-3 November 2017

Patent Ductus Arteriosus (PDA)

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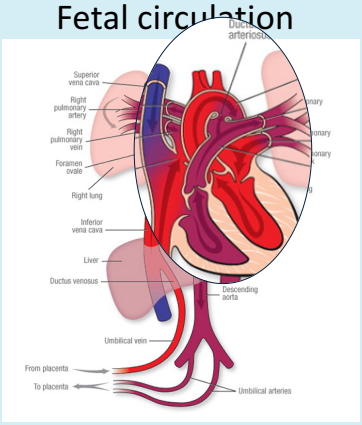
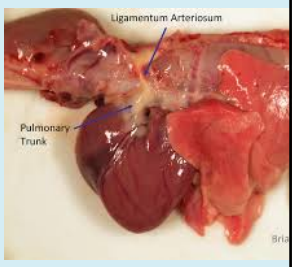
Fetal circulation



Normal closure of the PDA

- Initiated by increase in oxygen and changes in pulmonary and systemic BP
- Intimal ischemia then necrosis duct evolves into ligamentum arteriosum
- Full term closes 1-5 days after birth



Ductus arteriosus

Premature closure

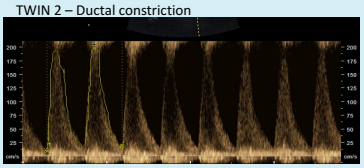
- ↑ RV pressure
- ↑ RAVVR
- RVH and RV dilatation

Persistent patency

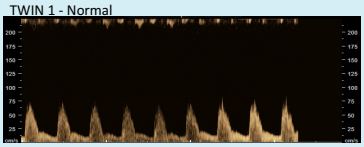
- L -> R shunt
- Pulmonary overcirculation
- Deterioration of neonatal respiratory and metabolic status

Fetus ductal constriction

TWIN 2 – Ductal constriction



TWIN 1 - Normal



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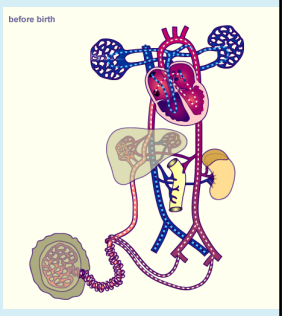
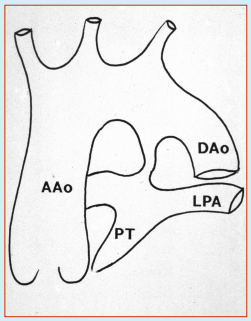
PDA

- Incidence 1:2000 full term infants
- 50% of babies born at <29/40 and/or <1750g
- 80% of preterm babies <1200g
- *Associated with other forms of congenital heart disease*



DUCT DEPENDENT PULM. BLOOD FLOW

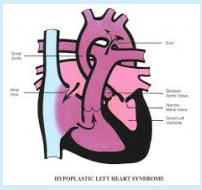


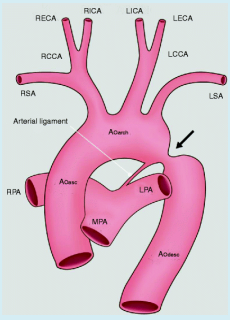
Virtually any malformation with: Pulmonary Atresia/ Severe PS

- **Tetralogy of Fallot**
- **Critical Pulmonary Stenosis**
- **Tricuspid Atresia**
- **Double Inlet Ventricle**
- **Transposition with VSD**
- **Ebstein's Malformation**
- **Miscellaneous**

DUCT DEPENDENT SYSTEMIC BLOOD FLOW

- Coarctation of the aorta
- Hypoplastic left heart
- Critical aortic stenosis





Clinical features

Symptoms

- Silent
- Asymptomatic
- FTT
- Recurrent chest infections
- Neonatal/infantile CCF

Examination

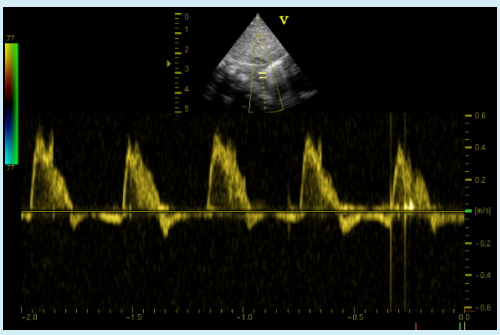
- Bounding pulses
- Increased LV impulse
- Continuous machinery murmur
- *Hepatomegaly*
- *Tachypnoea*

Echocardiography

- Exclude structural heart disease
- Visualisation of duct
  - Presence
  - Morphology
  - Doppler examination
- Haemodynamic consequences
  - Left heart volume overload

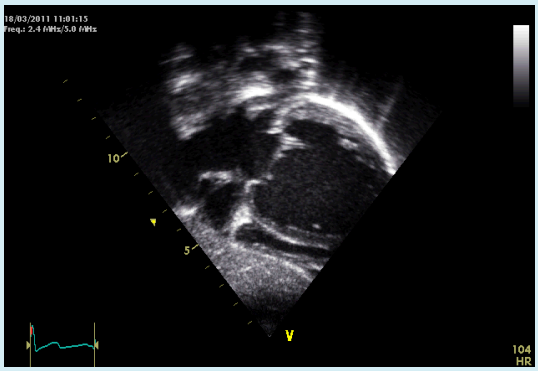
Subcostal view

- Abdominal aorta

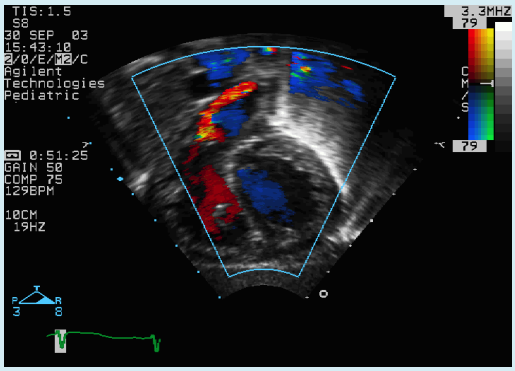


Subcostal view

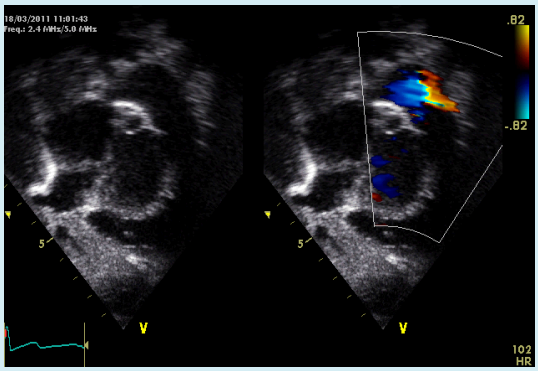
- 2D - LHVO



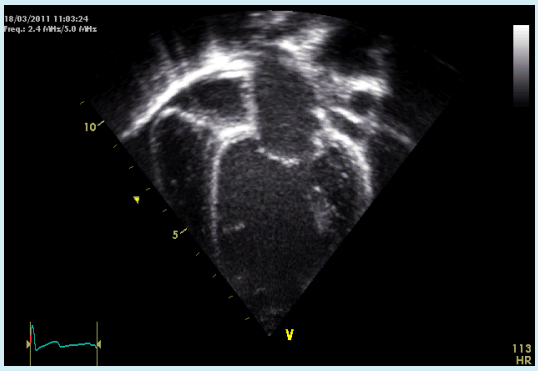
Subcostal view



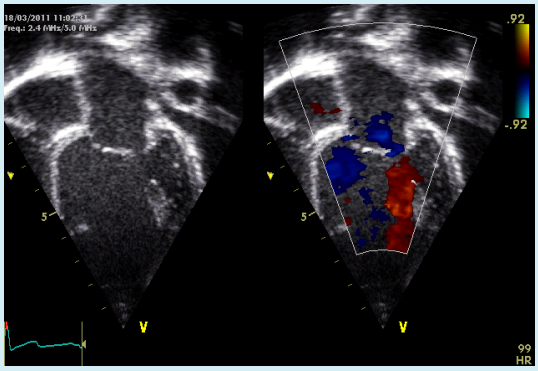
Subcostal oblique view



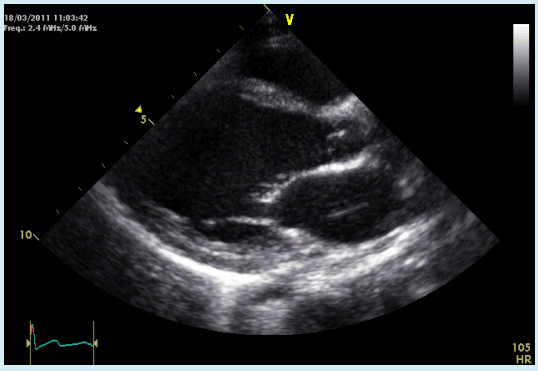
Apical 4 Chamber view



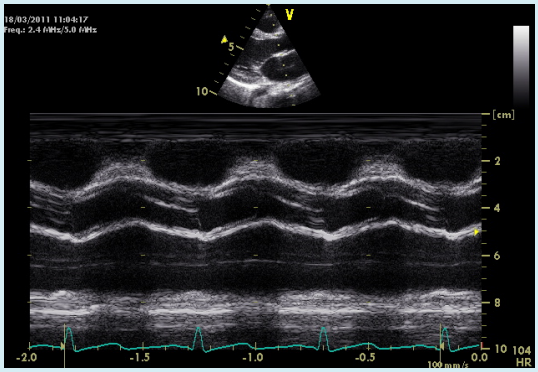
A4Ch view – colour flow mapping



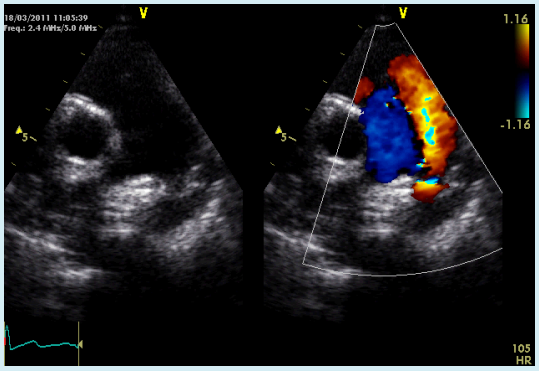
Parasternal long axis view



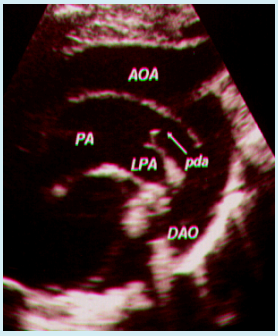
PLAx view – LA:Ao M-mode

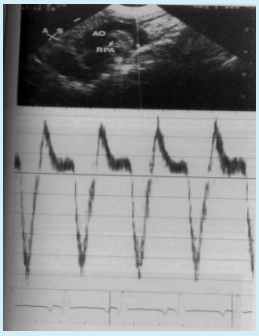


Parasternal short axis view

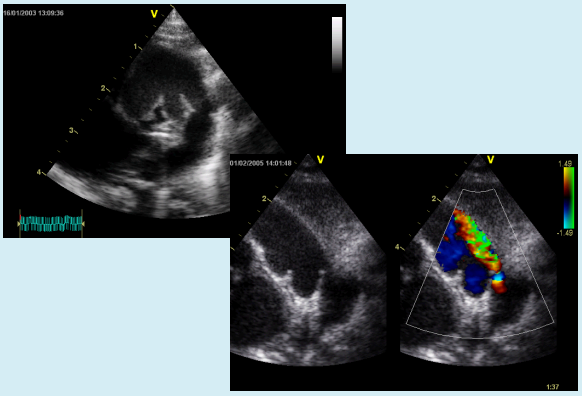


Suprasternal long axis view



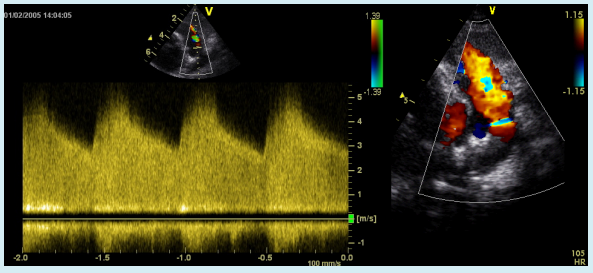


High left parasternal view – "ductal cut"



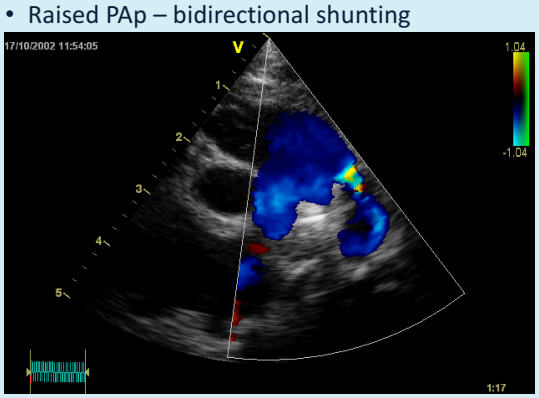
Doppler examination of the duct

- Low PAp – high velocity L->R shunt



Doppler examination of the duct

- Raised PAp – bidirectional shunting



Doppler examination of the duct

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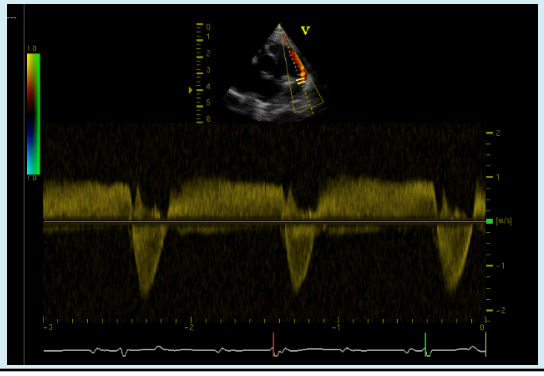
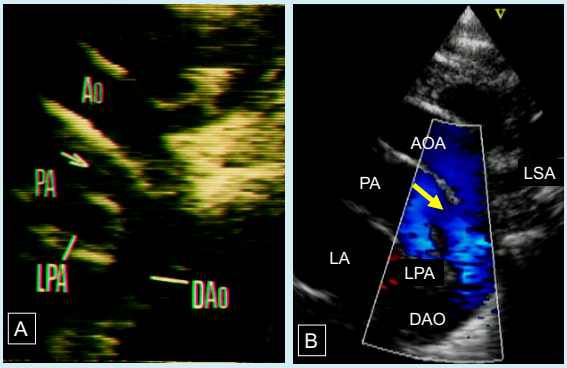
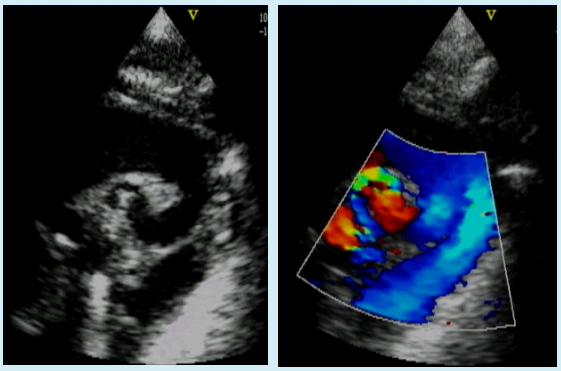


Doppler examination of the duct

- Isolated R->L shunt



Morphology of the duct



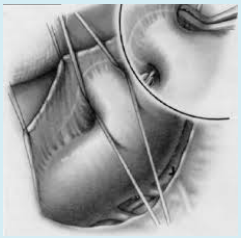
Treatment PDA

Preterm population

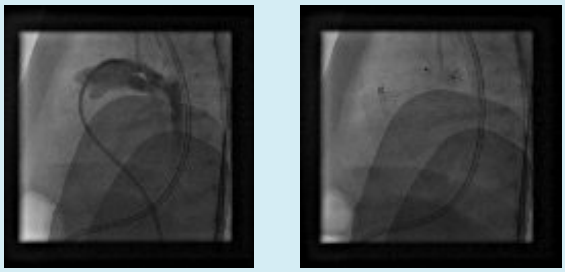
- Medical
- Surgical closure
- (Transcatheter closure)

Older child

- Transcatheter closure

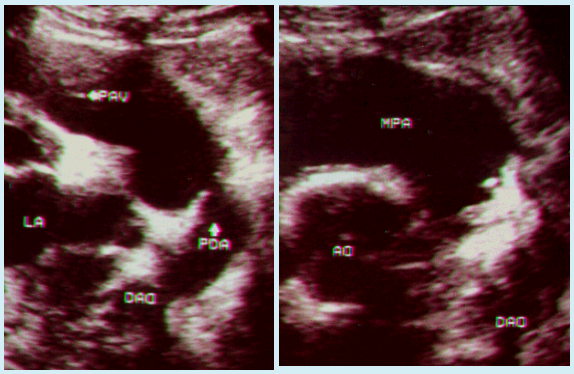


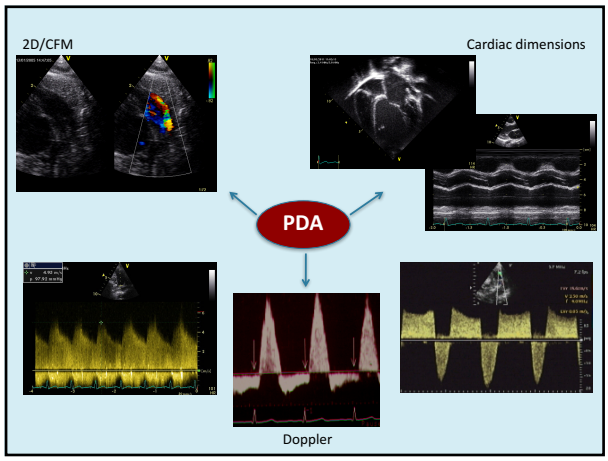
Transcatheter closure



1.2kg Baby

Post-device occlusion of PDA




2D/CFM
Cardiac dimensions
PDA
Doppler