GE HealthCare

# Precise imaging in severe cardiomegaly with single ventricle

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## Patient overview

8 year-old boy, 28 kg, referred from another hospital in Barcelona

## Cardiac diagnosis

- Left atrial isomerism
- Absent inferior vena cava
- Hemiazygos vein draining right superior vena cava (SVC)
- Persistent left SVC into coronary sinus (CS)
- Unbalanced atrioventricular septal defect (AVSD) – single ventricle
- Severe atrioventricular valve insufficiency
- Non-confluent pulmonary arteries
- Right sided aortic arch
- Post operative complete heart block

## Interventions

- 18 days: Bilateral BT shunt
- 12 months: Bilateral Glenn
- 13 months: Mechanical mitral valve replacement
- 14 months: Single chamber epicardial VVI pacemaker

## Clinical follow-up

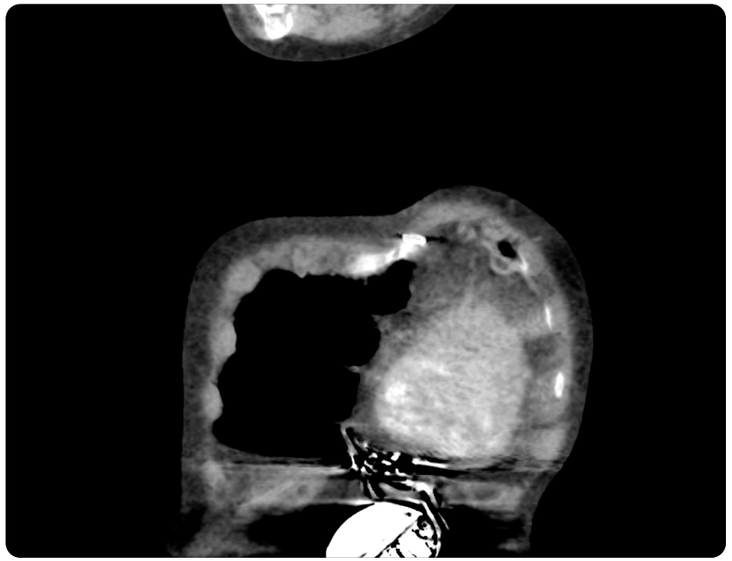
- Patient developed severe single ventricle dysfunction
- NHYA III
- Referred for cardiac transplant evaluation

## Clinical assessment and device used

- Not possible to perform CMR epicardial lead
- Severe cardiomegaly which made difficult to perform a correct deformation strain analysis
- GE HealthCare Vivid™ E95 R6 with 6S-D, M5Sc-D
- Vivid Pioneer with 6Vc-D, 4Vc-D and 6Sc-D
- EchoPAC to perform deformation analysis

## Conclusion & follow up

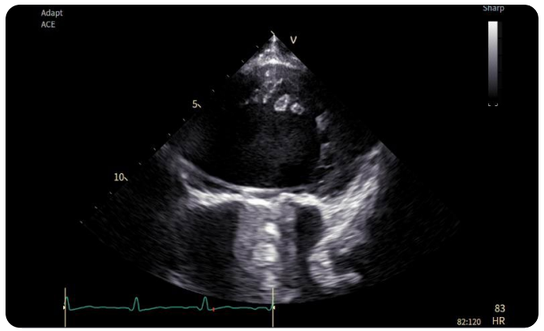
- Vivid Pioneer and 6Sc-D probe allowed perfect tissue visualisation in severe cardiomegaly in a single ventricle
- Reliable dyssynchrony assessment in single-ventricle cases is now possible with the 6Sc-D pediatric probe. Its ability to visualize all segments in large ventricles overcomes the limitations of traditional probes, enabling accurate 2D strain evaluation
- Strain analysis showed a clear dyssynchrony pattern induced by VVI pacing
- Findings supported the decision to upgrade to cardiac resynchronisation therapy implantable cardioverter defibrillator (CRT-D)



CT scanner showing single ventricle and pacemaker

**Pre-op evaluation with Vivid Pioneer**

Good image quality and contrast; however, due to the complexity of the anatomy, visualization of the lateral wall remained challenging with the 6Vc-D and 4Vc-D probes

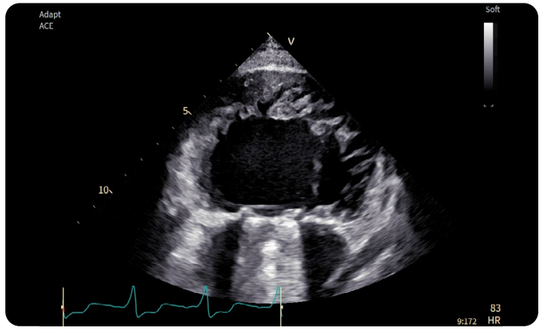



6Vc-D Probe

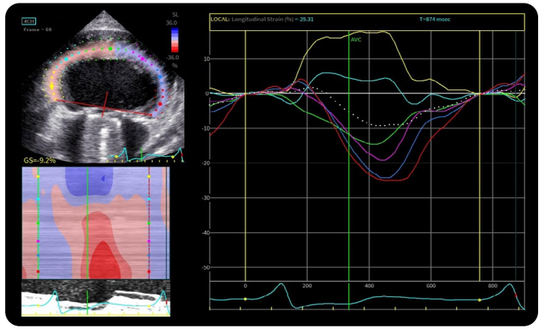

4Vc-D Probe



**Pre-op evaluation with Vivid Pioneer and the 6Sc-D high frequency probe**

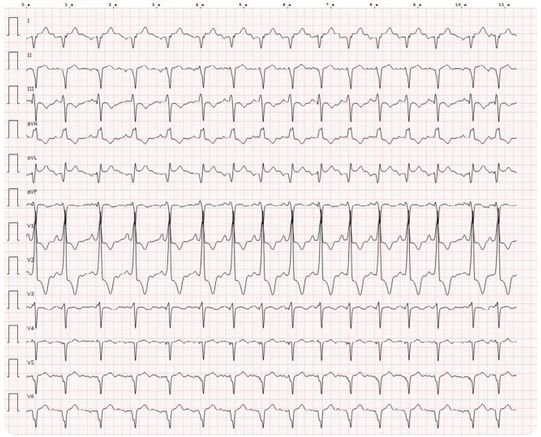



Excellent image quality, the 6Sc-D enables one single view to capture the whole image of the single ventricle while seeing the mitral valve very nicely.



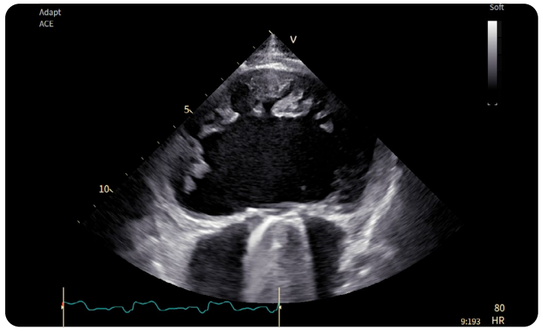
Deformation 2D Strain Analysis with EchoPAC. Perfect tissue visualization of the whole single ventricle allowing reliable (and effective) 2D strain analysis.

12 Lead ECG pre CRTP: QRSd 194 ms

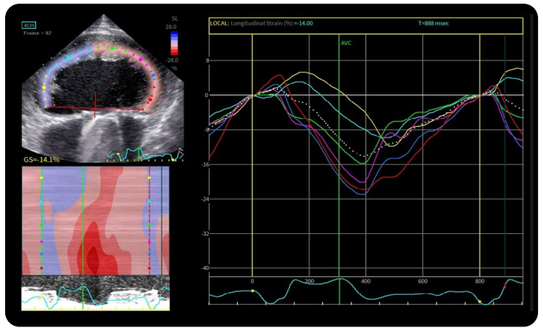


12 Lead ECG post CRTP: QRSd 151 ms

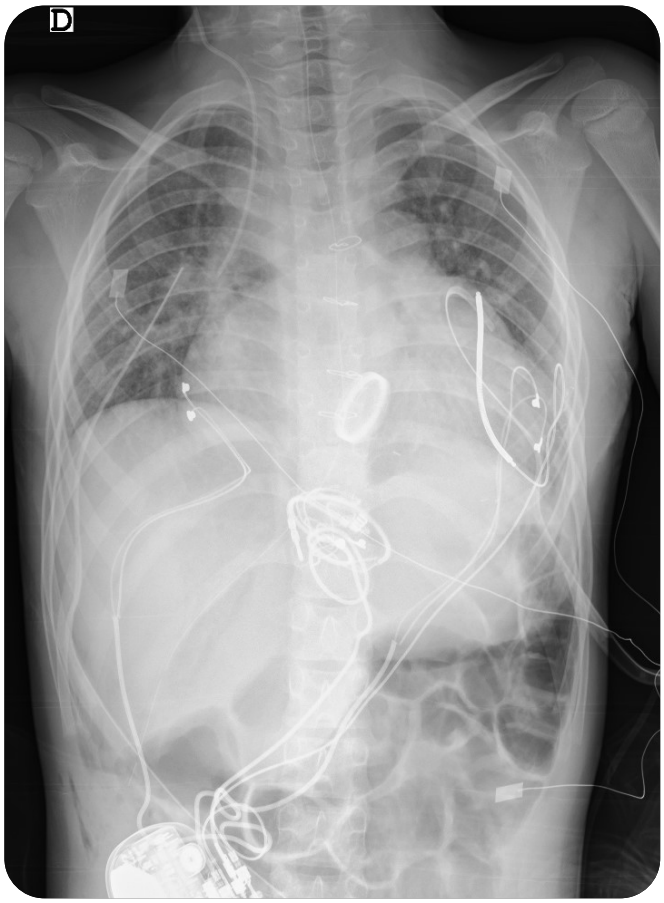
**Post CRTP evaluation with Vivid Pioneer**




Post CRTP



Strain post CRTP



CXR Post Op

Dr. Rosés is a paid consultant for GE HealthCare and was compensated for participation in this article. The statements by Dr. Rosés described here are based on his own opinions and on results that were achieved in his unique setting. Since there is no “typical” hospital/clinical setting and many variables exist, i.e. hospital size, case mix, staff expertise, etc. there can be no guarantee that others will achieve the same results.

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