17th World Congress in Fetal Medicine

A brighter light for the fetus

Lombardi C, Persico N, Boito S, Sandaite I, Cook A, Bijnens B, Garcia P, Bonnin A, Deiea H
Studio Diagnostico Eco, Milan, Italy

Objective

We present here some of our initial work from x-ray phase contrast synchroton imaging of the human fetal heart. Standard contrast micro computer tomography (micro CT) imaging can produce imaging at a resolution of 20-30 microns and its use in virtual autopsy is increasing. X-ray phase contrast synchroton imaging has a resolution 100 x folds compared to microCT without the need of using a contrast media.

Methods

At the Paul Scherrer Institute, PSI, the largest research institute for natural and engineering sciences, synchrotron radiation was used for the first time for fast, non-destructive, high resolution, quantitative investigations on fresh human samples.

Results

With X-ray phase contrast imaging resolutions of less than 1um can be achieved non destructively. At this resolution fine details of coronary vasculature including elastic lamina, the cardiac conduction system and muscle “fibre” orientation within the heart can be obtained.

Conclusion

Such “virtual microscopy” can be used to define the phenotype of fetal abnormalities at an unprecedented level.