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4D CT Aortogram: A Revolutionary Technique for Pre-Surgical Evaluation of Extra Cardiac Anomalies in Paediatric Patients

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Objective: To assess diagnostic yield of 4D CT Aortogram for pre-surgical evaluation of extra cardiac anomalies in paediatric patients.

Materials & Methods: 4D CT aortograms performed in paediatric patients in last 2 years were reviewed. We performed non ECG-gated 4D CT aortogram on 128 slice DECT scanner. Successive time frames were obtained by sequential scanning, followed by independent reconstruction of each 3D dataset. Post surgical outcomes were evaluated. Total number of aortic, other associated abnormalities and incidental findings like collaterals were calculated. This data was compared to the routine CT aortograms (42 cases) done in the previous years.

Results: 73 cases of 4D aortogram were analysed, out of which 8 cases of clinical suspicion were normal. 60 patients had aortic abnormalities. Out of these, 17 had associated pulmonary vascular and/or vena cava abnormalities. 4D acquisition helped in detection of small branch vessels and collaterals in 21 cases. Statistical analysis stated significant variance (p value <0.050) of detection of small vessels among both the techniques.

Conclusion: 4D CT gave very high spatial and temporal resolution of the anatomical variants. Cine viewing allowed selection of the best phase for a given abnormality and provided invaluable dynamic information that was not obvious on static images. Being a fully automated technique, this method is not operator dependent and helps in reducing radiation dose by tailoring dose to patient's morphology. In 28.7% of cases, 4D CT could identify small branch vessels and collaterals which would be difficult to identify on routine multislice CT angiography done on same scanner in previous years.

MRI of Corpus Callosum in Patients with Autism Spectrum Disorder in Kuantan

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Objective: To study the integrity of the corpus callosum among autistic children population in Kuantan, Pahang, Malaysia, which is determined by MRI's diffusion tensor imaging (DTI) parameters, fractional anisotropy (FA) and radial diffusivity (RD). These parameters represent the direction dependence of water molecules diffusion within the measured tissues. As corpus callosum is saturated with brain white matter tracts, the water molecules diffusion here will be direction dependent. Studies involving foreign populations have shown that there is distortion in the corpus callosum's DTI parameters in autistic population indicative of microstructural distortion. Whether similar findings will be observed in our local autistic population still remains a question. Other gross corpus callosum parameters such as its thickness, length and size are also studied.

Materials & Methods: 28 randomly selected autistic children under the International Islamic University Malaysia Medical Centre (IIUMMC), Kuantan follow-up are subjected to MRI scan. Limited MRI sequences including DTI are obtained and analysed. FA, RD, midsagittal thickness at the genu, body and splenium of the corpus callosum as well as its midsagittal length and size are measured. Data are tabulated according to age followed by statistical analysis.

Results: A weak negative correlation is found between the age and the FA of the corpus callosum. Other parameters such as the thickness, length and size show weak positive correlation with age.

Conclusion: Although the correlation is weak, our study shows that there is evidence of distortion of corpus callosum white matter microstructure in children with autism spectrum disorder in Kuantan, Pahang.