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FOURIER ANALYSIS OF MULTI-GATED BLOOD-POOL DATA IN PATIENTS WITH COMPLEX CARDIAC ANOMALIES. K. Nakamura, K. Takeda, H. Maeda, N. Yamaguchi, T. Nakagawa and M. Taguchi. Mie University School of Medicine. Tsu.

The clinical usefulness of Fourier analysis of multi-gated blood-pool data was evaluated in 18 non-cardiac subjects and 23 patients with complex cardiac anomalies (CCA) [Tetralogy of Fallot (TOF):14, Ebstein's anomaly (EA):2, tricuspid atresia (TA):2, double outlet right ventricle (DORV):1 etc].

Quantitative analysis was done by using interventricular phase difference [D(phase)] and amplitude ratio of right ventricle (RV) to left ventricle [R(amp)] and qualitative analysis was undertaken by functional images constructed with parameters of each pixel's phase angle and amplitude.

In patients with TOF, mean values of D (phase) and R(amp) were 25.3±10.4 degrees and 1.35±0.49 respectively and significantly larger than those of non-cardiac subjects. Values of D(phase) seemed to increase in proportion to the severity of cyanosis.

The size and dynamics of cardiac chambers could be easily estimated by visual interpretation of functional images in cases with CCA such as TA and DORV etc. It was interesting that in patients with EA, the atrialized RV was shown as the hypokinetic area with atrial phase.

This method is highly valuable for pathophysiologic investigation and differential diagnosis in cases with CCA.

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Application of Phase Analysis to Patients with implanted Pacemaker and Patients with WPW syndrome. Makoto Akaishi, Masato Tani, Hajime Yamazaki, Shigeru Kosuda, Toshikazu Samiya, Yaeko Takagi and Atsushi Kubo. Keio University School of Medicine. Tokyo.

Contraction patterns between left (LV) and right ventricles (RV) were evaluated using phase analysis in 12 patients with RV pacing (RVP) and 10 with WPW syndrome (WPW), compared with 10 normal subjects(NC).

Phase difference between LV and RV was larger in RVP (28.5 ±13.9°) than in NC (1.5 ± 6.0) and varied from -23° to +20° in WPW. Then LV contraction delay was noted in RVP.

Phase distribution in LV showed no remarkable asynchrony in RVP.

The site of initial contraction determined by cinematic display was interventricular septum in NC and RV apex in RVP.

In most cases of WPW, the site of initial contraction could estimate the location of Kent bundle which was determined by delta wave polarity of electrocardiograms.

Thus phase analysis gives clue to understand the contraction patterns of patients with conduction disturbance.

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Ventricular contraction mapping in WPW syndrome using phase analysis with gated pool study. T.Konishi,T.Ichikawa,Y.Futagami ,M.Hamada,T.Nakano,S.Maeda,H.Takezawa. Mie University School of Medicine. Mie.

Gated blood pool scan with Tc-99m was performed in 20 normal subjects and 14 patients with WPW syndrome. Ventricular contraction mapping using regional phase angle cine rotation was evaluated in left anterior, right anterior and left lateral view. In normals, earlier contraction site was located on anterior apical wall in right ventricle. Left ventricle usually had multiple earlier contraction sites. Above findings were closely correlated with reported epicardial breakthroughs in epicardial mapping study. In WPW syndrome, abnormal earlier contraction site was located in ventricular base just below the atrium, which subsided after abolished ECG delta wave with procain amide injection. In epicardial mapped case, Kent fiber was located in abnormal earlier contraction site.

We conclude that phase mapping was useful method to evaluate ventricular contraction-conduction relationship in normal subjects and patients with WPW syndrome, especially to detect Kent fiber portion noninvasively.

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DETECTION OF ACCESSORY CONDUCTION PATHWAYS IN WOLFF-PARKINSON-WHITE SYNDROME: ASSESSMENT BASED ON FOURIER ANALYSIS OF GATED BLOOD POOL STUDY. K.Nakajima, J.Taki, A. Tada, H.Bunko, K.Hisada and T.Misaki. Kanazawa University, School of Medicine. Kanazawa.

Twenty-seven patients with WPW syndrome were assessed by phase analysis of gated blood pool study and twenty-one had surgical correction of WPW syndrome by directly incising the portion of an accessory conduction pathway(ACP). Gated blood pool studies were performed by Tc-99m RBC(in vivo labeling) and equilibrium data were obtained in modified left anterior oblique and right anterior oblique projection. The localization of ACP was determined by electrophysiological study using catheter, epicardial mapping and surgery. Out of twenty patients whose ACPs were confirmed by surgery, 16 patients were correctly diagnosed by abnormal initial phase at the side of pre-excitation. Four left cardiac type could not be detected by phase analysis alone. Phase analysis provided interesing informations before and after surgery and can be useful for the evaluation of WPW syndrome.