

P. Pediatrics

Documentation of Tricuspid Regurgitation by Radionuclide Angiocardiography

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A diagnostic study of tricuspid regurgitation and malformed tricuspid valve was performed by radionuclide angiocardiography.

This study included 7 children with Ebstein's anomalies 3 cases, post-operation of ventricular septal defects 2 cases, Eisenmenger complex and congenital tricuspid stenosis, identified in 1970.

Age of the patient ranged from 6 months to 15 years and had systolic murmur that suspected tricuspid regurgitation at right lower sternal border.

99m pertechnetate was injected venously and presence and degree of tricuspid regurgitation were studied by visualization of right atrium,

right ventricle and inferior vena cava.

Inferior vena cava was apparently visualized in cases of Eisenmenger complex and congenital tricuspid stenosis, which, only the right atrium was visualized in the other remaining cases.

These results suggest that presumption; the malformed anterior leaflet of tricuspid valve visualize inferior vena cava as the regurgitated flow might be directed to Crista Terminalis which then causing a turbulent flow into inferior vena cava.

Based on this anatomic-hemodynamic idea, the authors could define tricuspid regurgitation identify the malformed tricuspid valve leaflet in each of the seven cases studied in this report.

Computalized Measurement of Renal Blood Flow in Infants and Children

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In pediatric nephrological practice it is desirable to obtain an accurate estimate of renal function for evaluation of prognosis. Such estimates of renal function are somewhat difficult to obtain in children, especially in new born infants and younger children, because of difficulty to obtain adequate blood and urine samples in standard clearance technique. For this reason the determination of the endogenous creatinine clearance is now widely used. But it is conceivable that the single injection clearance with external counting method using radionuclide is more applicable in younger children. This method reported by Blaufox et al. uses only two blood samples (3-5 minutes and

50-60 minutes after injection), but the collection of urine is not necessary. Then we have tried to modify this procedure using 16 KW minicomputa to make easy the analysis of clearance curve of ¹³¹I orthoiodo hippurate.

But the stimulus of blood sampling makes the child cry and move, especially in new born and younger infants, so that the clearance curve monitoring by the external counting method from the head is changed the line of decline, especially when sampled on 3 minutes after injection, and becomes unsuitable to measure the renal blood flow.

Therefore we changed the software of computa

for one sampling method (sampled on 50–60 minutes after injection).

245 children between 1 days and 16 years old were studied using our new method. Many of these were suffered from renal distress or other diseases influenced to renal function.

14 children between 3 days and 10 years old

who seemed in normal renal function were evaluated for standard renal blood flow.

As a result, the volume of renal blood flow is increased in parallel with the age, but the value of the renal blood flow per body weight are ranged about 15 ml/min. in children over 1 months old and below 10 ml/min. in new born infants.

Evaluation of Partial Renogram with ^{99m}Tc -DTPA in the Clinical Findings

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The renoscintigram and renogram with ^{99m}Tc -DTPA have been widely used. The renogram was, however, unsuccessful in some cases in relation to the clinical findings.

We have obtained the partial renogram from cortical and pelvic parts of the kidney. These parts designate the following areas, respectively; the cortical part is 1/3 outside and 1/2 length of long axis of the kidney, the pelvic part is 1/3 inside and 1/2 length of long axis. This method is easy using digital switch. The partial renogram was obtained from just after injection of ^{99m}Tc -DTPA into the cubital vein for following 20 minutes with the time frame of 20 seconds.

We have experienced 18 normal cases from 3 to 15 years of age. The normal pattern of the partial renogram was nearly the same on the total renogram. In the cortical renogram, time required for reaching the left peak was 2' 28" and

the right peak was 2' 31", after that time, and the curves gradually decreased with a gently down slope. In the pelvic renogram, the left peak time was 3' 48" and the right peak was 4' 43", later than the cortical renogram and then the curves gradually decreased with a gentle down slope and up slope more gradual than that of the cortical renogram. In the total renogram, the left peak time was 3' 06" and the right peak was 3' 18".

Next, we show a left small kidney in the case of 7 year old male. Left total renogram was with flat curve and lower peak was 8 minutes. The assessment of the findings is difficult, but the cortical renogram showed normal pattern.

We think that the partial renogram was useful in the investigation of the clinical findings and the grasp of the clinical situation.

Ventilation to Perfusion Relationship with Xenon-133 Regional Lung Function

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Pulmonary disease as well as heart disease alters regional ventilation and blood flow distribution without producing changes demonstrable by ordinary measurements of total pulmonary function. Radiographic methods for evaluation of regional lung disease may depict anatomic abnormalities but do not quantitate the degree of physiologic alteration. Blood gas determinations

and ventilatory function studies measure total lung function but provide no localization of regional derangements. Especially in infant there are some technical difficulties.

This study describes data obtained from 12 patients (Massive aspiration syndrome, aspiration pneumonia, lung cyst, lung sequestration, bacterial pneumonia, lobar emphysema, bronchial asthma).