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RENOSCINTIGRAPHY FOLLOWING EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY (ESWL).  
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ESWL is a new treatment for renal and ureteral calculous disease. However, not much work is so far reported regarding the effect of renal function. We studied the influence of ESWL on morphology and function of the kidney and urinary tract by sequential images of renoscintigraphy with bolus injection of 10mCi of Tc-99m-DTPA.

The result of the present study indicate that the intraparenchymal obstructive pattern was revealed at immediately after ESWL. This effect was seemed to be concerned with formation of hematoma and transient parenchymal damage. On the other hand, obstructive images were seen because of residual sands or small stones following crushed stones. However, little change was seen in sequential dynamic images, since these obstruction was excreted within three weeks on an average. Stillmore, even if numerous shock wave (more than 10000 shock) was present, unimproved change was hardly seen on the images. Combing the data of blood chemistry and radionuclide study, we conclude that ESWL causes no damage on morphology and function of the kidney and urinary tract except early stage after ESWL.

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EVALUATION OF FUNCTION OF RENAL TRANSPLANTS WITH DYNAMIC RENAL SCINTIGRAPHY.  
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There are many parameters used for evaluation of function of transplanted kidney by renal scintigraphy. The most important thing in management of renal transplant is evaluation of rejection reaction. However, any method have not been established for detection of rejection.

We calculated many parameters reported by some authors and some new ones and estimated them compared clinical data and status. Images were recorded after bolus injection of 6mCi of Tc-99m DTPA and the data were stored on a computer system and analyzed many parameters by selfmade BASIC programs. Evaluated parameters were PK-PA time, a perfusion index, T1/2, 70%ITT, peak time, kidney/background ratio and MTT with deconvolution analysis. Serial studies were performed. PK-PA time, a perfusion index, kidney/background ratio were significant in acute rejection.

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EVALUATION OF RENAL FUNCTION OF VUR NEPHROPATHY BY Tc-99m DMSA RENAL SCINTIGRAPHY.  
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Excretory urography (IVP) and renogram enable the evaluation of renal function in patients with VUR nephropathy. Morphological changes in the urinary tract are delineated and condition of passage can be identified. However, quantitative aspects of residual renal function are not demonstrated clearly.

99m-Technetium dimercaptosuccinic acid (Tc-99m DMSA), a renal scan agent, preferentially accumulates in the renal cortex and provides a qualified renal cortical image. The DMSA renal uptake rate demonstrates the residual cortical functioning region and ensures an accurate quantitative assessment of the function of individual kidneys.

We have evaluated the renal function and morphology in 150 patients with VUR from 1976 using DMSA renal scintigraphy.

There may be a discrepancy between the grade of VUR or the finding of IVP and DMSA renal uptake, and there are few increments postoperatively in the kidney function of the pathological side while the contralateral healthy kidney shows a compensatory increase in the renal function. This DMSA renal uptake ratio between healthy and pathological side seems to be one of predictable determinations for postoperative recovery of the pathological kidney.

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ESTIMATION OF Tc-99m-DMSA RENAL UPTAKE USING SPECT.  
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Renal function was assessed by measurement of Tc-99m-DMSA uptake by the kidney based on the trasactional tomographic image obtained by SPECT. Absorption was corrected by GE-STAR method using cut off level of 42%. In order to determine normal range measurement was made for 40 kidneys of each 10 of male and female volunteers confirmed of having normal kidneys. The average volume of the kidney was 220.4 ml for the right and 239.3 ml for the left for males, and 205.9 ml and 236.5 ml, respectively for females. The renal uptake of radioactivity (at 2 hrs) was 26.8% for the right and 27.6% for the left for males, with corresponding figures for females being 26.4% and 27.6%, respectively. Distribution range of renal volume and renal uptake was obtained by bivariate analysis with 90% and 95% probability. A good correlation was found between renal uptake in both kidney and Ccr value, in 53 patients including renal diseases. From these results, our method of renal function determination is considered to be accurate and potentially useful for clinical purpose.