

URODYNAMIC STUDY IN THE RENAL PELVIS USING
99m-Tc-DTPA RENAL SCINTIGRAPHY

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In order to investigate urodynamics in the renal pelvis, an urine flow labeled with 99m-Tc-DTPA was traced by the scinticamera. 10 mCi of DTPA was given i.v. and sequential renal images were taken up to 10-30 min. At the last part of the investigation, images were obtained from both ureter and bladder regions. The whole course of renal imaging was reproduced by VTR. While ROI was provided in the whole kidney, renal pelvis and bladder region, the radioactivity was measured for 10 min in each area and histograms related to counts and time course were obtained. A histogram from renal pelvis was analyzed and the following parameters related to the time course of DTPA in the renal pelvis were extracted. IAT was an initial appearance time of DTPA in the renal pelvis, DT disappearance time from the renal pelvis and the difference between DT and IAT was defined as the time retaining DTPA in the renal pelvis (IRT). Renal pelvic volume (Q) was estimated from the following equation: $Q = \frac{\int_0^t \text{Renal pelvic counts}}{\int_0^t \text{Urine volume}}$. IRT/Q may demonstrate an average intrapelvic transit time (aITT) and Q/IRT intrapelvic urine flow rate (UF).

Average values of IAT was 210-220 sec, DT 340-350 sec, Q 4.6-5.9 ml and UF 2.1-2.9 ml/min under mild diuretic state. No lateralization was noticed. In general, IAT was influenced by renal function, prolonged in the case of decreased renal function and shortened in the case of hypertension. In cases of hydronephrosis and dilated pelvis with various etiologies, DT was prolonged, Q increased and UF decreased, suggesting a retained urine flow in the renal pelvis.

In this preliminary work, it was demonstrated that an investigation of urine flow using 99m-Tc-DTPA renal scintigraphy can be applied to urodynamic study in the renal pelvis.

CLINICAL EVALUATION OF RENAL FUNCTION BEFORE AND
AFTER LITHOTOMY BY SERIAL SCINTIGRAPHY.

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The serial scintigraphy with ¹³¹I-Hippurate or ^{99m}Tc-DTPA is useful method for diagnosis of morphologic and functional conditions of the kidneys, especially on the condition of the urinary tract obstruction.

We reported 5 cases of renal stones in the upper part of the ureter and kidney which were very useful to diagnose with this method. This examination was performed in these patients pre and postoperatively (1~2 years after lithotomy as a follow up study).

After i.v. injection of radiotracer ¹³¹I-Hippurate 200~300 µCi or ^{99m}Tc-DTPA 2~3mCi, the serial renal scintiphotos were taken on the sitting position with Toshiba's Gamma Camera (GCAL01).

Images were compared with findings on IVP and patterns of hippuran renogram. In the case recognized abnormal retention on the images remarkably, the effect of lasix (furosemide) for the purpose of renal function test was investigated. These examinations were helpful as a follow-up study before and after urological operation, particularly functional images obtained serial scintigraphy is very reliable and give valuable information of mild obstruction which might not be detected on IVP and renogram.