Renal Blood Flow Study with Xenon-133 Washout Method in Hydronephrosis


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In 30 patients with urogenital diseases, the intrarenal distribution of blood flow was determined by Xe-133 washout method. Nine of the subjects had unilateral or bilateral hydronephrosis, secondary to ureteral obstruction as proved by the IVP. (Ureteral calculus, P-U stenosis, and ureteral stricture). In each of these cases, we performed Xe-133 washout method and compared it with renogram, IVP, angiogram and some other tests.

In seven subjects with normally functioning kidney, the cortical renal blood flow was 73.4% ± 2.8 (SE) of total renal blood flow. Blood flows of the juxtamedullary and the inner medullary region were 18.5% ± 2.0 (SE) and 7.9% ± 1.4 (SE), respectively. Nine subjects with hydronephrosis showed a significant decrease in both the flow rate and percentage distribution of flow into the cortical region (P<0.01), contrary to a significant increase in percentage distribution of flow into the juxtamedullary and inner medullary region (P<0.01). The degree of reduction of cortical renal blood flow correlates with the degree of hydronephrosis as assessed by IVP.

Comparison between pre-operative and post-operative condition was done in three cases. (P-U stenosis→plasty, L-ureteral calculus→lithotomy, L-ureteral stricture→plasty). After the operation, the cortical blood flow increased from 36.4% (mean) to 52.7% (mean).

This is a useful method to assess the renal function more quantitatively than renogram, IVP, and angiogram.

Simultaneous Tracing of 197-Hg-Chlormerodrin Uptake Curve and 131-I-Hippuran Renogram with Double Isotope Technique

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With a double isotope technique, simultaneous tracing of 197Hg-chlormerodrin uptake curve and 131I-hippuran renogram, and consequent renal scintiscanning are routinely carried out. This procedure not only saved the time required for each tracing, but explored the problems in