Winter's "segment c".

The normal value for "T½" was 4.98±1.76 min. and that for "t½" was 1.32±0.53 min. Very high reproducibility was observed in this method. Moreover the original renogram curve can be almost completely simulated with these three parameters (i.e. "T½", "t½" and "T o").

Intravenous injection of Furosemide influenced on renogram curve immediately. Administration of Furosemide a few minutes before the radio-hippuran injection, resulted in obvious shortning of "Bt" and "t½". When we administered this substance 20 minutes after radio-hippuran injection, an obvious improvement was resulted in some cases with abnormal record probably due to over-dehydrasome extent upon the renal reserve function. tion. It seems this improvement depends to So that such application of Furosemide to renogram is very useful to distinguish some false positive patterns from true abnormalities.

Evalution of Renal Scanning, Radioisotope Renaography and Renal Angiography on Renal Tuberculosis

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Radioisotope renography, renal scanning, and renal angiography were performed on a total of 47 cases of renal tuberculosis: unilateral renal tuberculous, 34 cases, bilateral, 5 cases; and that of solitary kidney 8 cases.

The diagnostic efficacy of these three methods were compared and following results were obtained.

1. The diagnostic rates of tuberculosis obtained by these three methods were: radioisotope renography, 92%; renal scanning, 96%; and renal angiography 88%.

2. The affected kidneys were devided into 4 groups: Group 1 of the kidney with normal pyelographic appearance, Group 2 of the kidneys with localized tises, Group 3 of desolute kidney and Group 4 of the kidney with stenosis of the upper urinary tract.

Radioisotope renography was found effective in diagnosis of renal tuberculosis of Group 4, and renal scanning and renal angiography were effective in that of Group 2, all these methods were found effective.

Clinical Application of Renoscintigram

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There have been various papers reperting the value of the renoscintigram by ^{203}Hg, ^{197}Hg-Neohydrin and MAA. The purpose of this paper is to report its fundamental analysis and its application to a case of pyelonephritis.

Method:

1) Renal macroautogram of the rabbit was made using ^{203}Hg-Neohydrin and MAA.

2) MAA was injected to the pyelonephritic kidney selectively at the time of selective renal angiography. Renoscintigram of ^{203}Hg-Neohy-

drin was also performed.

Result:

1) It was shown by macroautogram that ^{203}Hg-Neohydrin was accummulated in the renal cortex maximally at 1 hr. MAA was shown histologically in the cappillaries of the renal cortex and renal arteries and veins.

2) Renoscintigram by ^{203}Hg-Neohydrin showed deformity of the kidney and in homogeneous R.I. uptake which were compatible with the Nephrogram of the renal arteriography.

The Measurement of Glomerular Filtration Rate Using ^{131}I-Sodium Iothalamate

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Clinical evaluation of the measurement of glomerular filtration rate using ^{131}I-sodium iothalamate (Glofil 131) were discussed.

Methods and results were as follows.

1) Urines were collected 15, 30, 60 and 120 minutes after the intravenous injection of 20 microcuries ^{131}I-sodium iothalamate, and urinary excretion rates were calculated.

In 10 individuals with normal glomerular function, average urinary excretion rates were 17.0, 29.7, 43.8 and 60.2% respectively, whereas in those with glomerular impairment, the rates were found lower, and the significant difference was seen between both groups.

Thus, the measurement of the excretion rate of ^{131}I-sodium iothalamate is useful in screening glomerular function as P.S.P. test for tubural secretion.

2) Clearance of ^{131}I-sodium iothalamate and sodium thiosulfate were simultaneously measured after the simultaneous administration of two agents by the constant infusion technique, in totally 32 individuals with and without renal impairment.

The doses of ^{131}I-sodium iothalamate given for the clearance study were between 70 and 100 microcuries.

Good correlation was seen between clearances of ^{131}I-sodium iothalamate and sodium thiosulfate, and the clearance ratio of ^{131}I-sodium iothalamate to sodium thiosulfate was approximately 0.8.

Accordingly, the measurement of glomerular filtration rate using ^{131}I-sodium iothalamate should be significant clinically.

3) The binding rate of ^{131}I-sodium iothalamate with red cell and plasma protein were as low as 0.16 and 5.2% respectively.

4) Radiorenogram using ^{131}I-sodium iothalamate were recorded, and compared with that using ^{131}I-sodium hippurate (Hippuran).

The renographic curves by ^{131}I-sodium iothalamate were found to be consisted of three segments as those by hippuran, though the first segment was mainly formed by the vascular one, differing from that with hippuran, and the second segment rose only one-fifth as rapidly as with hippuran, because the bulk of the tracer remains in the vascular bed, whereas with hippuran up to 80~90% is retained by the kidney during its first passage.

Peak activity was reached at approximately the same time with both agents.

The third segment declined much more slowly, reflecting the slower excretion of ^{131}I-sodium iothalamate.