Plastic Surgery in Hydronephrosis

(Indications and Follow-up. Isotope Nephrographic Studies)

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Surgical interventions for the reconstruction of the renal pelvis were performed in 108 cases between 1962 and 1974. On follow-up, 3 to 6 months after operation the results were found good or satisfactory in 54 cases (50%). Isotope nephrography revealed a good or satisfactory fall of the curve in the excretion phase in 49 out of the 54 cases (94%), distinct retention curves having been found in the remaining 6%.

In 35% of these cases isotope nephrography showed a far more complete urinary drainage than it had been assumed on the ground of radiography. In 63% of the cases the results of the two diagnostic methods were congruent.

Impairment of urinary drainage leads to distension of the upstream portions of the urinary pathways and, in the course of time, to fibrous transformation of the muscular walls and successive deterioration of renal functions.

Organ-saving surgical procedures, in the first place in congenital anomalies marked by impairment of drainage, are aimed at the “functional restoration or preservation of the remaining renal parenchyma by relieving it from the abnormal pressure as a result of restitution of urinary passage” [8].

Recognition of the diagnostic possibilities of radioisotopes has given existence to various procedures for the assessment of renal function. Measurement of radiation on the body surface subsequent to i.v. administration of a suitable tracer substance emitting gamma-radiation (¹³¹I-hippuran) enables us to assess the tubular function and the state of urinary drainage on each side separately with a minimum of radiation exposure and discomfort to the patient, the sources of error of the method being taken into account [4, 7, 11].

It is essentially the 3rd phase of the isotope nephrogram (ING), the excretory phase, which provides information on urinary drainage forming the subject of the present study. This phase is made up of the passage of the radioisotope from the radiation field of the collimator, reflected in the descending limb of the curve, though there is some overlap from the second phase represented by the ascending limb of the curve as an expression of arterial blood flow, glomerular filtration, tubular secretion, intrarenal transport to the renal pelvis and intrarenal distribution of radiation [2, 12].

The descent of the curve may be delayed or, instead of falling after phase 2, it may continue to rise if, for instance, the rate of urinary production is below 1
ml/min, if there is distension of the renal pelvis as a result of obstruction to urinary flow [12].

The morphologic characters at the level of the proximal urinary pathways are studied by means of contrast roentgenography.

Combination of radiographic procedures with isotope nephrography provides close information on the changes responsible for the obstruction to urinary flow.

We have found on the ground of a total of 6000 radioisotope nephrograms studied since 1967 in various diseases of the urinary tract that reliable assessment of the results of pyeloplasty surgery requires, in addition to contrast roentgenography also ING.

Clinical aspects

Presenting symptoms

Pain caused by intermittent distension of the dilated renal pelvis, still more often by recurrent or chronic infections favoured by the urinary retention, are the most common symptoms of hydronephrosis [5].

Colicky pains, persistent aches or intermittent pains, vertebral or abdominal discomfort as well as pain subsequent to drug-induced excessive diuresis belonged to the presenting symptoms in 66%, i.e. 108 patients having had plastic surgery of the renal pelvis between 1962 and 1974.

Fifteen per cent of these patients had renal calculi. In two cases haematuria consequent upon a minor renal injury was the presenting symptom. Approximately 17% of the patients were free from any subjective symptom.

Surgical indications

The indication for a plastic operation on the renal pelvis rests, in addition to the subjective symptoms and a history of recurrent urinary infections, on the functional efficiency of the obstructed kidney. In children a retarded development is also decisive. General condition and age are also of major relevance. With regard to age it has to be considered that after plastic operations on the kidney the post-operative course is less smooth and the stay in hospital longer than after primary nephrectomy. This fits in well with the general rule that if we have to operate at all, it should be done as early as possible [1].

It has to be also considered that, owing to the high adaptability and restorative power of the juvenile organism, the long-term results of these operations are bound to be more favourable in the earlier age groups than in advanced age.

The possibilities for morphological and functional assessment of the kidneys have been referred to in the foregoing. In our experience the alternative whether primary nephrectomy or plastic surgery should be given preference may be settled in many cases on the evidence of the preoperative ING, the second section