

History of percutaneous renal biopsy

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Introduction and aims

The first renal biopsy of native kidney was performed in 1901 in a surgical procedure for renal decapsulation in the treatment of a Bright's syndrome. The PRB was born in 1944 when Nils Alwall adapted a technique for percutaneous liver biopsy in the kidney, using an aspiration needle technique with a radiographic procedure for the localization of the right kidney and keeping the patient in a sitting position.

Methods

With this innovative method, he obtained adequate tissue in ten of the thirteen patients. However, this procedure has been previously described in the literature by Iversen and Brun in 1951 [1], which also used an aspiration needle and the sitting position but, in contrast to Nils Alwall, they used intravenous pyelography for localization of the right kidney; unfortunately they obtained adequate tissue only in 53% of patients. Given the poor results of this technique, Kark et al in 1954 made significant changes including the prone position [2] of the patients with a sandbag placed under the abdomen to reduce the mobility of the kidney and the introduction of a new type of needle, the Franklin-modified Vim-Silverman needle, which trapped the tissue in the needle and then sheared it off, achieving adequate tissue in 96% of patients and no major complications. To localize the lower pole of the kidney they used as landmark the distances between the vertebral spinous processes and the 11th and 12th ribs, and the movement finder needle following a deep inspiration. Over the years the technique has been improved more and more, increasing the adequacy of the sample and reducing the risk of complications.

Results

In 1962 the use of radiological images was introduced for the localization of the kidney, later replaced by the ultrasound real-time imaging. Since then this procedure, which was initially performed by nephrologists, has gradually become a prerogative of radiologists. In fact, between 1964 and 1974 the PRB was performed in 95% by nephrologists, while in 1980s the number of nephrologists who performed the PRB was gradually reduced in favour of radiologists and in 2011 Lane et al showed that radiologists were the main performers of this technique.

Conclusions

Today, the standard procedure for PRB involves the use of real-time ultrasound and automated spring-loaded biopsy device. Percutaneous renal biopsy (PRB) is still considered an irreplaceable tool for diagnosis, prognosis and choice of treatment of several primary or secondary kidney diseases. In 1962 the use of radiological images was introduced for the localization of the kidney, later replaced by the ultrasound real-time imaging. Since then this procedure, was routinely introduced in the clinical use for diagnosis and choice of treatment of several primary or secondary kidney diseases. Today, the standard procedure for PRB involves the use of real-time ultrasound and automated spring-loaded biopsy device.



Figure 1. Iversen and Brun who performed the first renal biopsy

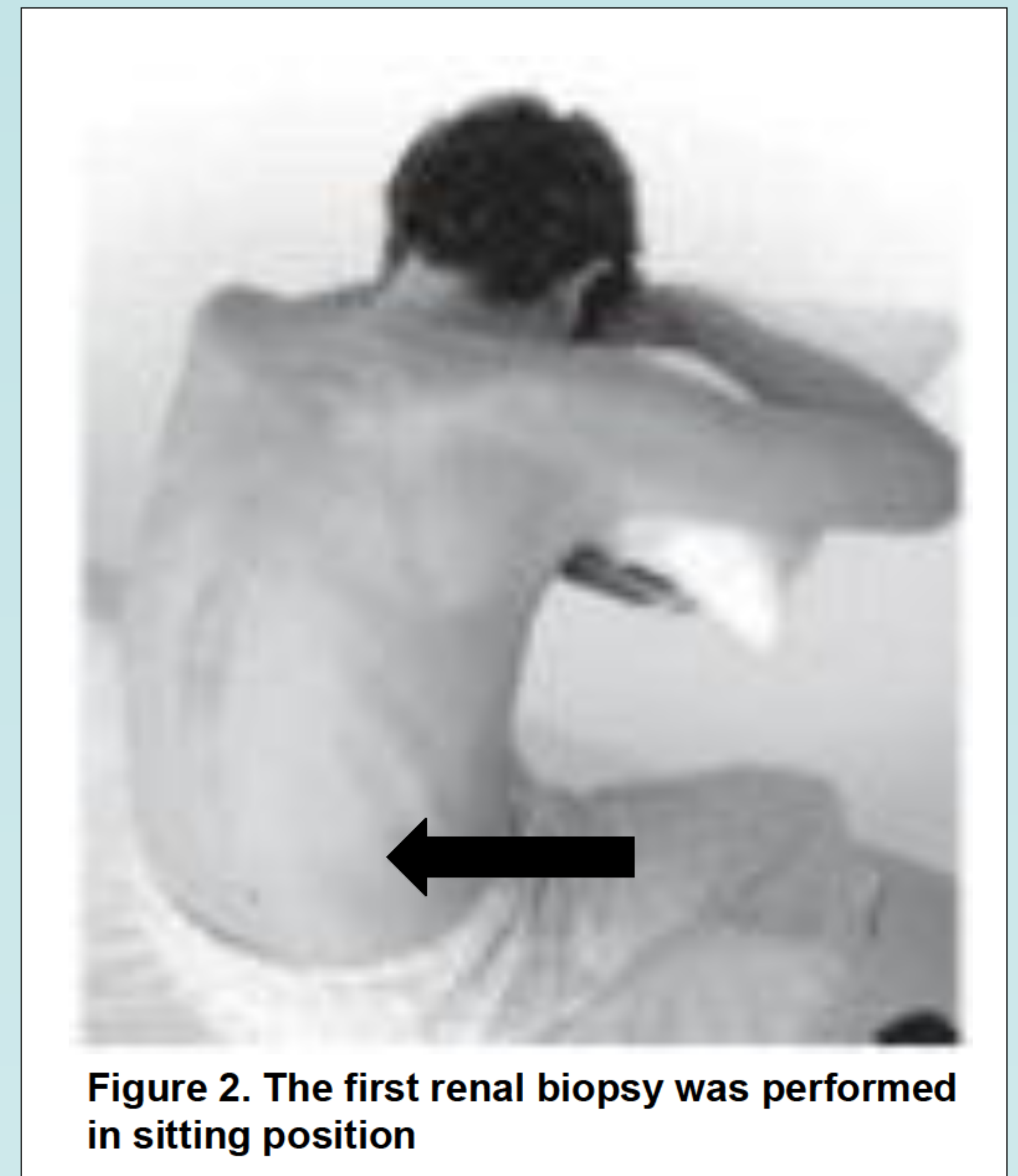


Figure 2. The first renal biopsy was performed in sitting position

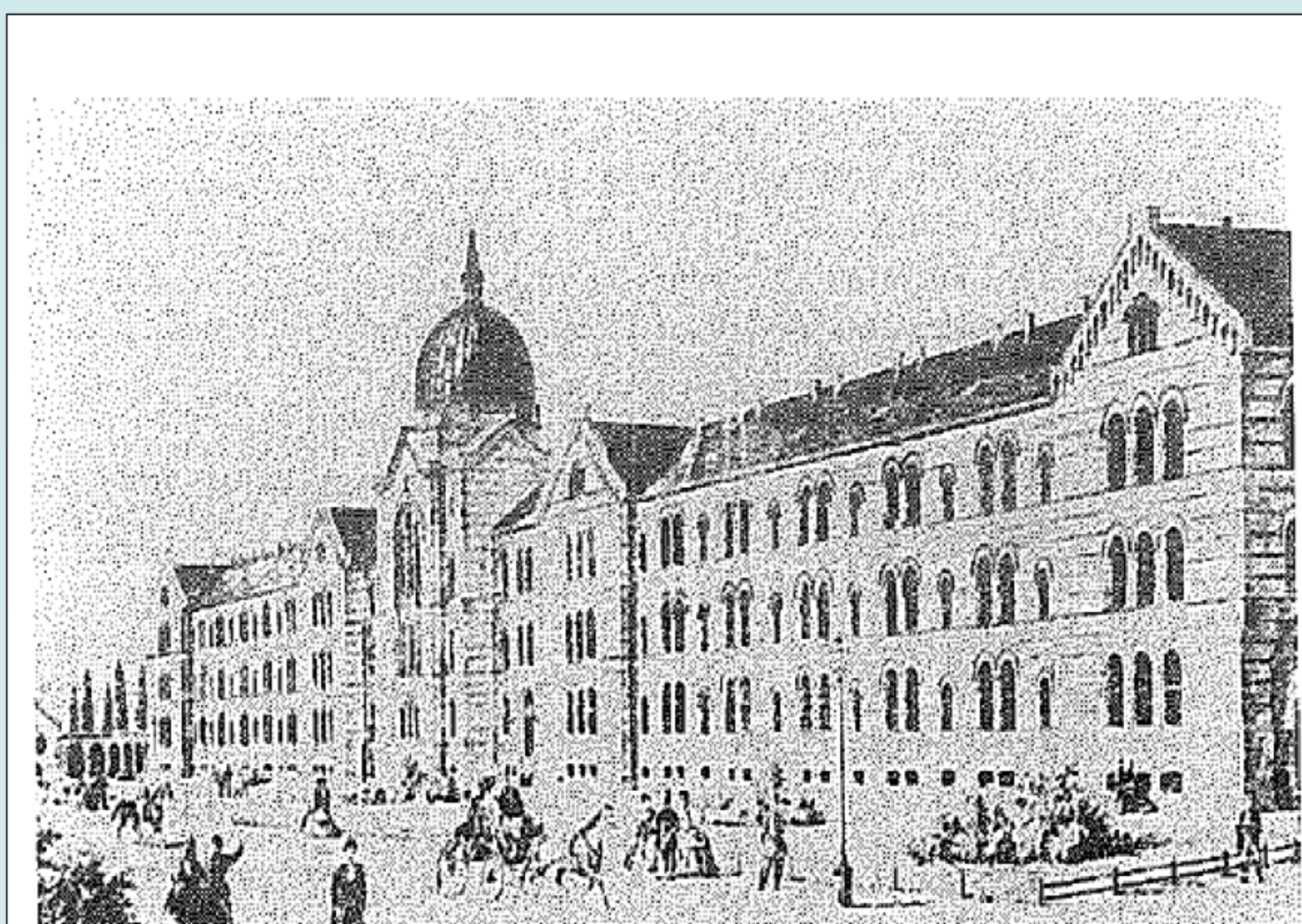


Figure 3. Municipal hospital in Copenhagen where the first renal biopsy was performed

References:

1. Iversen P, Brun C. Aspiration biopsy of the kidney. *Am J Med.* 1951 Sep;11(3):324-30
2. Kark RM, Muehrcke RC. Biopsy of kidney in prone position. *Lancet.* 1954 May 22;266(6821):1047-9

