A Modified Needle Kidney Biopsy: An Open Technique

G.		Ruggieri ^a
M.V.		Tata ^b
F.R.		Ventola ^a
C.		Spinelli ^a
A.		Balducci ^a
G.		d'Adamo ^a

^aNephrology and Dialysis Service, and ^bDepartment of Surgery, San Giacomo Hospital, Rome, Italy

G. Ruggieri, Nephrology and Dialysis Service, San Giacomo Hospital, Via Canova 29, I-00100 Roma (Italy)

Dear Sir,

Gault and Muehrcke[5], in the Editorial 'Renal Biopsy: Current Views and Controversies' deal with the choice between the percutaneous and the surgical route.

The percutaneous approach, although performed by a skilled operator relying on valuable aids for localization, may result in: (1) the need to repeat the procedure several times; (2) a specimen without or with very little cortical tissue, inadequate for diagnosis; (3) intrarenal and/or perirenal bleeding.

Open biopsy avoids these risks, except that of intrarenal hemorrhage, but, according to the classic procedure of withdrawing the sample with a knife, it is usually done under general anesthesia – with its own complications -and results in prolonged hospitalization.

It seems interesting to communicate the open technique – set up and performed in our Unit – for withdrawing tissue with the use of a needle via a small lumbar incision under local anesthesia.

The open technique proposed by us runs parallel to the other modifications of the open renal biopsy (RB) techniques which have been introduced in order to reduce the incidence of complications, yet providing sufficient tissue for diagnostic purposes [3, 6, 7].

In order to accomplish the proposed technique, the patient is placed in prone position in slight Trendelen-burg, on a bed angled in the middle so that the lumbar region is extended.

Mepivacaine hydrochloride 2% is injected into the skin, 2 cm below the 12th rib, reaching medially the lateral margin of lumbar muscles. A 5- to 6-cm incision is made in the skin and subcutaneous tissue, parallel to the 12th rib, and care is taken to obtain hemostasis of the margins. The fibers of the large dorsal muscle are dissociated and the transversal fascia is exposed and deep layers are injected with anesthetic. Fascia and muscles are dissociated following the direction of

the fibers until pararenal space is exposed with retractors. The existence of lower pole arteries is ascertained by sight and digital palpation. The site for biopsy is chosen and two specimens of renal tissue are withdrawn using the Tru-Cut needle (Travenol). Tissue fragments are fixed immediately for light, electron and immunofluorescence microscopy. Tamponment with gauze is maintained for 10 min. Thereafter, if bleeding occurs, a chromic catgut suture is placed in the kidney to obtain hemostasis. After irrigation with a vial of gentamicin, the muscular layers and

the aponeurosis are sutured with separate stitches, leaving a rubber drain which is removed on the 3rd day. The skin is sutured with silk.

Between 1979 and 1983, 49 RBs were performed on 47 patients with this technique. In 2 RBs (1 patient) there were no glomeruli: however, the specimens, consisting of cortical tissue, were characterized by the presence of many microcystic lacunae. In the others there were 8–32 glomeruli (mean 23 ± 7.8) in the specimens studied by light microscopy. It should be noted that the number of glomeruli was not stated by the pathologist in the specimens studied by electron and immunofluorescence microscopy.

The histological diagnosis could be established in all the cases.

The complications observed were only the appearance of macroscopic hematuria in 2 cases and delayed healing of the surgical wound in 2 patients suffering from nephrotic syndrome.

The following items characterize the proposed technique:

Local anesthesia: on this subject we may recall that some fatal complications of surgical RB referred to in literature were linked with general anesthesia [8].

Short incision: in agreement with the statements of Gill [6] and of the group of Spargo et al. [3], our experience showed that a 4- to 7-cm incision is necessary and suffi-

368

Ruggieri/Tata/Ventola/Spinelli/Balducci/d'Adamo

cient to expose the lower pole of the kidney, to ascertain the presence of eventual lower pole arteries, angiomatous or cystic superficial formations, and consequently to choose the precise site to perform RB and to verify the hemostasis of the parenchyma. It is impossible to limit the length of incision to the 2 cm reported by De Campos Freire et al. [4] since an effective control of bleeding would not be possible.

Bleeding control: the proposed technique takes advantage of a needle which does little damage but presents all the advantages of surgical techniques, in particular the possibility to control bleeding. In 1 case, we had to stop the bleeding of the parenchyma caused by the needle; the hole was closed with an X-shaped suture without complications afterwards.

Low risk of provoking an arteriovenous fistula: compared to RB performed with a knife, deep enough to include juxtamedullary glomeruli, our technique, using a needle, would be less likely to cause an arteriovenous fistula as the number of rather wide vessels eventually cut would be lower. Using a forceps entails a very low risk of provoking an arteriovenous fistula, but on the other hand, it is impossible to include deep glomeruli in the specimen [3].

Short hospitalization: patients were kept in hospital for 5–6 days to wait for closure of the wound.

Adequacy of tissue: in agreement with some Authors we prefer to obtain two biopsy cores [1, 2, 9]. Withdrawal of samples with the Tru-Cut needle under visual control yields specimens formed by cortical tissue and the needle reaches deep enough to include juxtamedullary glomeruli. The latter can not be obtained using the technique proposed by Gill [5] and applied by the group of Spargo et al. [3] which limits the sample to outer cortical tissue.

The technique of surgical biopsy utilized by Spargo's group and the one proposed by us involve relatively

simple procedures which possess the advantages of surgical techniques under local anesthesia.

Moreover, our technique also yields the opportunity to examine deep glomeruli.

We think that the availability of such surgical techniques allows RB to be undertaken at minimal risk.

References

- Almkuist, R.D.; Buckalew, W.M., Jr.: Techniques of renal biopsy. *Urol. Clin. N. Am.* 6:503–517 (1979).
- Bretland, P.M.; Hoffbrand, B.I.: Kidney biopsy. *Br. med. J.* 218: 619 (1980).
- Chodak, C.W.; Gill, W.B.; Wald, V.; Spargo, B.: Diagnosis of renal parenchymal diseases by a modified open kidney biopsy technique. *Kidney int.* 24:804–806 (1983).
- De Campos Freire, G.; Seraphim, S.; Montellato, M.: Small open kidney biopsy: technique. Experience with 250 cases. *J. Urol.* 59:357–359 (1963).
- Gault, M.H.; Muehrcke, R.C.: Renal biopsy: current views and controversies. *Nephron* 34:1–34 (1983).
- Gill, W.B.; Cole, A.T.: Cup forceps cortical renal biopsy: an improved technique of open renal biopsy. *J. Urol.* 709:538–542 (1972).
- Kark, R.M.: Renal biopsy. *J. Am. med. Ass.* 205:220–226 (1968).
- Patil
L.; Bailey
G.L.; Mahoney
E.F.: Open renal biopsy in uremic patients. *Urology* 5:293–296 (1974).
- Spargo
B.H.; Seymour
A.E.; Ordonez
N.G.: Renal biopsy pathology with diagnostic and therapeutic implication (Wiley
New York 1980).