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ULTRASONICALLY GUIDED FINE NEEDLE ASPIRATION BIOPSY IN RENAL FOCAL LESIONS – PERSONAL EXPERIENCE

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SUMMARY

Aim: The evaluation of ultrasonically guided fine needle biopsies in focal renal lesions.

Methods: The authors present their own experience on 100 ultrasonically guided fine needle aspiration biopsies.

Results: In this group of patients no complications in biopsies were found. A high level of accuracy in the first (76%) and repeated aspiration (98%) biopsy with a low incidence of false negative results (2%) was observed.

Conclusions: Reviewing the data from the relevant literature and their personal experience, the authors suggest that a punction in all sonographically visualized renal lesions should be followed by a cytological analysis, and that insufficient biopsies should be repeated. The interpretation of the cytological findings requires caution, however, due to the suggested possibility of false negative or false positive results.

Key words: kidney, solid focal lesions, fine needle biopsy, ultrasonography

SAŽETAK

Cilj: Evaluacija sonografski vođene biopsije tankom iglom u fokalnih lezija bubrega.

Metode: U radu je prikazano osobno iskustvo u 100 ultrazvučno vođenih aspiracijskih biopsija tankom iglom.

Rezultati: U ovoj grupi bolesnika nije uočena ni jedna komplikacija biopsija, a prikazana je visoka točnost prve (76%) i ponovljene (98%) aspiracijske biopsije, uz nisku incidenciju lažno negativnih rezultata (2%).

Zaključak: Sumirajući podatke iz recentne literature i osobna iskustva, autori sugeriraju da svaku solidnu fokalnu leziju bubrega treba punktirati i citološki analizirati, a insuficijentne biopsije ponoviti. Naznačena je mogućnost lažno negativnih i lažno pozitivnih rezultata, te je prijeko potreban oprez pri interpretaciji citološkog nalaza.

Ključne riječi: bubreg, solidne fokalne lezije, biopsija tankom iglom, ultrazvuk

INTRODUCTION

Modern diagnostics of solid focal renal lesions includes intravenous urography, conventional or color – Doppler sonography, standard or substractial angiography, computerized tomography and magnetic resonance. Although highly sophisticated, these methods are often unavailable, and in many cases inappropriate for an accurate diagnosis of renal neoplasm, thus requiring a more invasive diagnostic approach.[1,2] Aspiration biopsy with a fine needle (FNB) can procure valuable cytological findings.[3] Owing to the development of new ultrasonic devices, the intervention can be now performed under continuous sonographic monitoring. In the last few years ultrasonically guided needle biopsy has become the subject of many scientific discussions.[4,7] Satisfying results give this new, safe and easy method an important place in the modern nephrourologic practice. The technique and principles of such a method have been described in relevant literature, but some evaluations are still the subject of study. Our own experience with 100 biopsies in cases of focal renal lesions is a contribution to the future judgment of the presented method.

METHODS

During the period April 1987 – May 1991, 100 ultrasonically guided aspiration biopsies in suspected neoplastic processes of the kidney have been performed at the Department of Ultrasonic Diagnostics, Clinical Hospital Center Rijeka. Eighty-one patients underwent a biopsy, the age-limit being between 17–76 years, while the male-female ratio was 65:35%, respectively. In all the cases, immediately preceding or following the

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operative intervention, the conventional ultrasonic examination of the abdomen was performed. Patients not operated upon were regularly controlled by ultrasound. The ultrasonic device used in the process was ALOKA SSD-280-LS. Examinations were performed with a linear and sector probe of 3.5 MHz. A linear probe from the same manufacturer (model UST 507 B5-3.5 MHz), sterilized by the standard procedure, was used for the interventional renal approach. Local anesthesia with lidocaine (1%) was used most frequently. For the aspiration, a needle of 23 gauges (0.6 mm) sufficed, whereas for the passage through the muscular abdominal wall a needle twice as thick (1.2 mm) had to be used. The cytological specimens were presented on 20 glass-plates, stained by May-Grünwald-Giemsa, immersed in cedar oil and subsequently analyzed under small or medium enlargement, even under immersion objective when necessary. All biopsies were performed under strict observance of the rules of surgical sterility.

RESULTS

During a period of 45 months 100 ultrasonically guided biopsies were performed in 81 cases of solid renal focal lesions. Nineteen biopsies had to be repeated (Table 1).

Table 1. The correlation between cytological and intraoperative findings after 100 biopsies performed on 81 patients.*

	FINDINGS (aftre 100 biopsies)	
Diagnosis	Cytological	Intraoperative
Malignant tumor	40 (49%)	42 (52%)
Benign tumor	4 (5%)	3 94%)
Normal findings	34 (42%)	0
Insufficient findings	2 (2%)	0
Initial abscess	1 (1%)	0
# patients	81 (100%)	45 (56%)

*In 19 patients biopsy had to be repeated due to insufficient cytological specimen.

Cytological findings revealed a malignant tumor of the kidney or of the renal calyx in 40 cases (49%) (Figure 1), a benign tumor in 4 cases (5%), and in 2 patients (2%) an initial renal abscess was diagnosed (Figure 2).

In 34 cases (42%) the aspiration biopsy revealed normal renal tissue, and the findings were interpreted as the hypertrophy of Bertini's column (Figure 3) or as a similar anatomical variation. All such patients were controlled sonographically over a long period of time (12–24 months). In one patient (1%) the findings were inadequate even after the second biopsy, and sonographic follow-up was performed.

Wherever cytological findings showed a malignant or benign tumor, operative procedure was indicated. In the case of the renal abscess, as well as in the case of rare lobar nephronia,[12] successful conservative treatment (ultrasonically guided local antibiotic therapy) was chosen. All cytological findings of neoplasm were verified intraoperatively, one benign tumor being revealed as hypernephroma. The patient with two previous unsuccessful biopsies was sent to a surgery six months later, following an ultrasonic examination that showed invasive growth of a suspect nature. Subsequently, malignoma was detected.

Figure 1. Linear longitudinal scan of the left kidney with suspected isoechoic focal lesion during biopsy (cytological findings: tumor).

Figure 2. Semioblique linear scan of the left kidney with mesorenal hypoechoic irregular area during aspiration biopsy (cytological findings: abscess).

Figure 3. Semioblique linear scan of the left kidney with signs of chronic pyelonephritis and isoechoic focal lesion during biopsy (cytological findings: normal).

The presented results indicate high specificity (100%), sensitivity (95%), positive predictive value (100%), and negative predictive value (94%) in the described method with a relatively high percentage of cytologically insufficient material (19%). By ultrasonographic examination immediately after the biopsy together with a regular ultrasonic and clinical follow-up, not one of the known complications (serious hematuria, implant metastasis, etc.)[4–6,8–11,13] occurred.

DISCUSSION

Comparing the data from recent literature[4–6,9–11] with our results, we noticed some common points. In our group the accuracy of the first biopsy was 76%, and the accuracy of all biopsies in the 81 patients was approximately 98%. The analysis of the obtained results also showed that we had a greater number of insufficient findings (19% – first biopsy) than other authors;[6,9,10] the cytological material was estimated as insufficient when the role of inflammation necrosis or peripheral bleeding was dominant, and in all the cases where the material had been inadequately prepared. There were no false positive results, although in 2% of the cases we had misleading negative results (in both cases malignant processes were subsequently verified). In our opinion, in all the suspect findings, the needle-biopsy should be repeated.

In 81 sonographically guided aspiration biopsies we achieved an accurate diagnosis in 79 (98%) patients. In one patient surgery was indicated after a delay of six months, as certain sonographic alterations were subsequently discovered at a regular ultrasonic control. In 100 biopsies we had no complications, except rare and passing hematuria and slight intra-or postpunctional pain, which is a benign and not uncommon occurrence in such interventions.

Our experience in ultrasonically guided aspiration biopsy in focal renal lesions correlates with the data from recent literature.[4,6,8,11] The absence of the described rare complications[8,10,11,13] permitted the procedure to be repeated in 19% of the cases, which resulted in only 2% of false negative results. Aspiration biopsy with fine needle guided by ultrasound is the method of choice in all cases of solid focal renal lesions. It requires a close collaboration of various specialists (urologist, sonographer, cytologist), supported by faultless technique and high quality of ultrasonic devices. The prerogatives of the applied method are manifold: it is uncomplicated, quick, economical and accurate, requires minimal preparation of patients, and has a low rate of complications. Of course, the possibility of some false negative results imposes regular sonographical follow-up, as well as caution when suggesting surgery.

REFERENCES

1. Chisholm GD. Urological surgery. In: Forrest APM, Carter DC, MacLeod IB, eds. Principles and practice of surgery. Edinburgh, London, Melbourne and New York: Churchill Livingstone, 1985:585–621.
2. Temmer B, Lovrenčić M, Kovačević D, Fišter H. Radiološka dijagnostika. In: Novak R, ed. Odabrana poglavlja iz urologije. Zagreb: Sveučilišna naklada Liber, 1987:13–52.
3. Znidarčić Ž. Citološka dijagnostika u urologiji. In: Novak R, ed. Odabrana poglavlja iz urologije. Zagreb: Sveučilišna naklada Liber, 1987:431–440.
4. Fučkar Ž. Sonografija urogenitalnog sustava. Rijeka, Ljubljana: Partizanska knjiga, 1987:168–170.
5. Fučkar Ž. Intervencijski ultrazvuk u fokalnih lezija bubrega. In: Kurjak A, ed. Ultrazvuk u kliničkoj medicini. Zagreb: Naprijed, 1989:528–531.
6. Holm HH. Interventional ultrasound. In: Recent advances in ultrasound diagnosis–5. Excerpta Med, 1986:1–15.
7. Fučkar Ž. Intervencijski uroloski ultrazvuk. In: Kurjak A, Fučkar Ž, Gharbi HA, eds. Ultrazvuk abdomena i malih organa. Zagreb: Naprijed, 1990:345–350.
8. Fučkar Ž. Uvod u intervencijski ultrazvuk. In: Kurjak A, ed. Ultrazvuk u kliničkoj medicini. Zagreb: Naprijed, 1989:515–521.
9. Juul N, Torp-Pedersen S, Gronval S, Holm HH, Koch F, Larsen S. Ultrasonically guided fine needle biopsy of renal masses. J Urol 1985;133:579–588.
10. Holm HH, Kristiansen JK. Interventional ultrasound. Copenhagen: Munskgaard 1985:46–87.
11. Grant EG, Richardson JD, Smirniotopulus JG, Jacobs NM. Fine- needle biopsy directed by real-time sonography: technique and accuracy. AJR 1983;141:29–34.
12. Fučkar Ž, Čohar F, Mozetič V, Šustić A. Ultrasonically guided percutaneous therapy of lobar nephronia. Radiol Iugosl 1991;3:201–204.
13. Ferucci JT, Wittenberg J, Margolies MN, Carey RW. Malignant seeding of the tract after thin needle aspiration biopsy. Radiol 1979;130:345–354.