
The Role of “Core-Biopsy” in the Diagnostics of Pelvic Tumors

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Abstract:

Tumors of the small pelvis represent a wide range of different nosological units and occur at any age. Distinguish between congenital and acquired neoplasms, which can not only come from the tissues of the small pelvis, but also involve them in distant metastases in malignant neoplasms of various localizations. The most sparing minimally invasive method of morphological verification is the puncture core biopsy under the control of ultrasound navigation, however, the diagnostic value of the method, sensitivity and specificity vary widely in various forms of small pelvic tumors and depending on the experience of the institution. Material and methods. In the Department of Oncogynecology of the Tashkent City Branch of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology, in the period from 2018 to 2023, core-needle biopsies were performed in 82 patients with primary tumor and metastatic lesions of the small pelvis. 40 standard, 42 multifocal biopsies were performed - 30 from two sites, 12 from three. Results. The final histological diagnosis by ultrasound-guided core-needle biopsy of the small pelvis was established in 73

(89%) patients, out of the total number of patients. In 60 (82.2%) patients, a malignant tumor was diagnosed, in 13 (17.8%) the process was benign. Repeated biopsies were performed in 4 patients, which made it possible to establish the final diagnosis. 9 patients underwent diagnostic laparoscopy and open biopsy of the tumor due to the ineffectiveness of core-needle biopsy. All patients received a final diagnosis. Conclusion. Ultrasound-guided core biopsy of a pelvic tumor is a safe and reliable method of morphological verification, characterized by high diagnostic accuracy. The overall effectiveness of the technique is 83%. In the presence of a zone of tumor necrosis, the use of multifocal biopsy increases the information content of the biopsy material. In the group of patients with suspected lymphoproliferative disease complicated by the course of the tumor process, if the first core-biopsy attempt is not informative, an open tumor biopsy is indicated.

Keywords: pelvic tumors, core-biopsy, adenocarcinoma, lymphoma, ovarian cancer.

Introduction

Tumors of the small pelvis represent a wide range of different nosological units and occur at any age. There are congenital and acquired neoplasms, which can come not only from the tissues of the small pelvis, but also involve them in distant metastases in malignant neoplasms of various localizations [1,4]. For example, Krukenberg metastases to the ovaries in tumors of the gastrointestinal tract. When clarifying the diagnosis of the nature of small pelvic tumors, the features of the retrouterine space, the most sparing, minimally invasive method is a core-needle biopsy under ultrasound guidance, however, the diagnostic value of the method, sensitivity and specificity vary over a wide range in various forms of small pelvic tumors and depend on the experience of the institution [2,13]. If the method fails, surgical methods of diagnosis, such as diagnostic laparoscopy, or open biopsy can be used [3,5,6]. The lack of material for a full-fledged histological examination, the lack of information of the obtained material, repeated biopsies delay the correct diagnosis, which delays the start of therapy and increases the risks for the patient [7,8].

The aim of the study is to improve the results of the diagnosis of pelvic tumors by using a core-needle biopsy under ultrasound guidance.

Materials and Methods

In the Department of Oncogynecology of the Tashkent City Branch of the Republican Specialized Scientific and Practical Medical Center of Oncology and Radiology, in the period from 2018 to 2023, core-needle biopsies were performed in 82 patients with primary tumor and metastatic lesions of the small pelvis. The median age was 52 years (18 to 86 years). Most often, the tumor was localized in the retrouterine space; a biopsy

of the formation located in this area was performed in 75 cases. In 7 cases, the largest component of the tumor was determined in the projection of the greater omentum. 40 standard, 42 multifocal biopsies were performed - 30 from two sites, 12 from three. In all cases, the biopsy was performed using a BN-G2 14-18 Gauge x 15cm disposable biopsy needle (Fig. 1). The diameter of the needle for the biopsy gun was chosen based on the size of the focus. Large-caliber needles (14 Gauge) were used for superficial and volumetric formations larger than 4 cm, and thinner needles (18 or 16 Gauge) were used for small and deep-seated lesions. In all cases, general or local anesthesia was not required. After preparing the patient and control ultrasound, a trephine biopsy was performed.

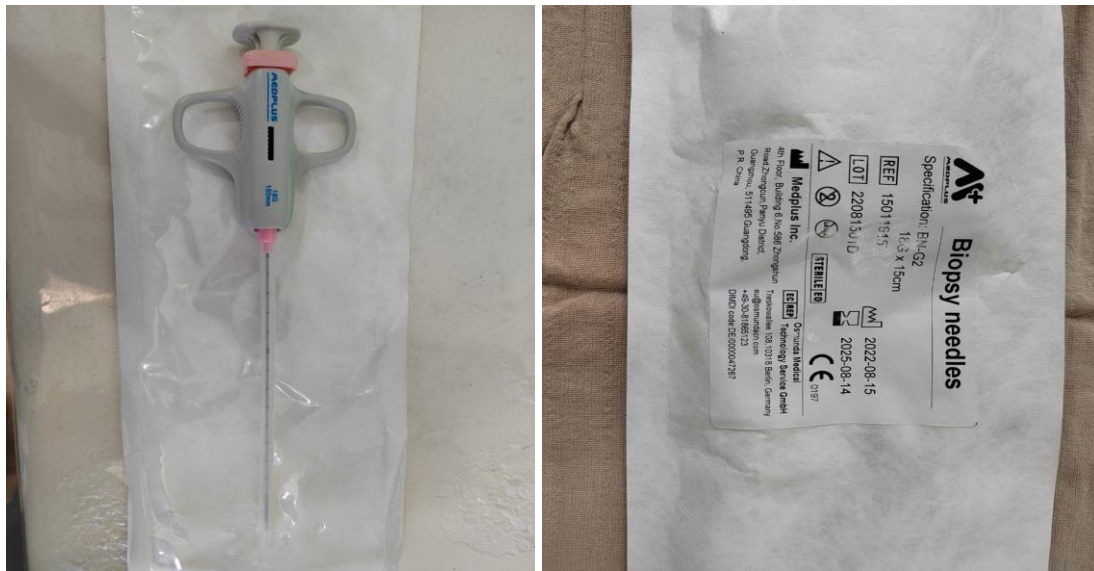


Figure 1. BN-G2 biopsy needle.

Research Results

The final histological diagnosis by ultrasound-guided core-needle biopsy of the small pelvis was established in 73 (89%) patients, out of the total number of patients. In 60 (82.2%) patients, a malignant tumor was diagnosed, in 13 (17.8%) the process was benign. Repeated biopsies were performed in 4 patients, which made it possible to establish the final diagnosis. 9 patients underwent diagnostic laparoscopy of the tumor due to the ineffectiveness of core biopsy.

The spectrum of nosological units is presented in Table. 1. Immunohistochemically (IHC) examined 15 (20.5%) biopsy specimens. The most common indications for IHC studies were tumor immunophenotyping in lymphoproliferative diseases, differential diagnosis between metastases of malignant tumors, and to clarify verification in sarcomas. In all cases, the final diagnosis was made (Table 2). In the group of patients with a morphological diagnosis established by ultrasound-guided core biopsy (n=73),

the average number of obtained biopsy cores was 1.23 (from 1 to 4), the average core size was 14 mm (from 1 to 33 mm), while in the group of patients in whom the biopsy was uninformative (n=9), the average number of obtained columns was 1.11 (from 1 to 3), the average size of the column was 5 mm (from 3 to 12 mm). There were no significant statistical differences in the number of obtained columns (p=0.34) and the total size of biopsy specimens (p=0.1). Out of 51 patients with an echographic picture of ovarian lesions, the final diagnosis of ovarian cancer was made in 45 cases, and other diseases were verified in 6 patients. In 3 patients, a granulosa cell tumor of the ovary was verified. Of the 15 patients who were clinically suspected of a different diagnosis, lymphoma was verified in 7 cases, of which 5 were non-Hodgkin's lymphomas and 2 were Hodgkin's disease.

Table 1. Histological structure of verified tumors

Tumor	Number of patients	
	absolute quantity	%
Malignant (n=60)		
<i>Ovarian cancer</i>	45	61,6
Adenocarcinoma G1	21	28,7
Adenocarcinoma G2	18	24,6
Adenocarcinoma G3	6	8,2
<i>Granulosa cell tumor of the ovary</i>	3	4,1
<i>Lymphoma</i>	7	9,5
Hodgkin	2	2,7
non-Hodgkin	5	6,8
<i>Metastatic tumors:</i>	1	1,3
Adenocarcinoma	1	1,3
<i>Sarcomas:</i>	4	5,4
Fibrosarcoma	1	1,3
Liposarcoma	1	1,3
Rhabdomyosarcoma	2	2,7
Benign (n=13)		
Fibroma	6	8,2
Dermoid cyst	3	4,1
Lipoma	4	5,4

The sensitivity of ultrasound-guided pelvic core biopsy for ovarian cancer was 82%, specificity was 87%, and the diagnostic accuracy of the method was 90%. Among 2 patients with an echographic picture of the lesion of the greater omentum in the form

of a tumor conglomerate, the diagnosis of adenocarcinoma metastases was verified in 1 case, and liposarcoma of the greater omentum was diagnosed in 1 case. Of the 5 patients examined for another disease, 4 had sarcomas of various origins. There were no complications after core-needle biopsy of the mediastinal tumor under ultrasound control.

Table 2. Comparative efficacy of core-needle pelvic biopsy and diagnostic laparoscopy

Tumor	Total patients	Core-needle biopsy		Diagnostic laparoscopy	
		Verification	Efficiency %	Verification	Efficiency %
Ovarian cancer	50	45/50	90	5/5	100
Non-Hodgkin's lymphoma	8	5/8	62,5	3/3	100
Dermoid cyst	3	2/3	66,6	1/1	100

Discussion

Malignant tumors of the female genitalia account for up to 18% of all types of oncology [9,14]. Benign ovarian tumors account for 66.8% to 80.3% of all ovarian neoplasms. While in the structure of the incidence of malignant neoplasms in women, ovarian cancer accounts for 4.4% [11,14]. The choice of the optimal method of treatment depends on the histological structure of the formation, the prevalence of the tumor process. In the case of primary unresectable, suspected germ cell tumor, lymphoma, systemic drug treatment comes to the fore, the appointment of which is impossible without a clear morphological diagnosis [8,12,15]. Usually the diagnosis is established on the basis of an ultrasound examination of the pelvis. Oncomarkers (CA-125, HE4, ROMA index, inhibin, hCG, AFP) are examined on a mandatory basis. The most important stage of the examination are imaging methods. For this purpose, multislice computed tomography or magnetic resonance imaging with intravenous contrast is performed [10,11]. In case of suspicion of a metastatic ovarian tumor (Krukenberg's metastases), EGDFS and barium enema with colonoscopy are also used.

For the purpose of morphological verification, various methods can be used, differing both in the degree of invasiveness and in diagnostic accuracy. The most common minimally invasive technique is ultrasound-guided or CT-guided core biopsy. CT-guided biopsy is more expensive and more difficult than ultrasound-guided biopsy, the method is accompanied by radiation exposure and takes more time. Fine-needle aspiration followed by cytological examination is the first used percutaneous technique for morphological verification of lymphoma [12,13]. However, this study is not as informative as a core biopsy; it is often impossible to determine the tumor architectonics from cytological samples [9]. In the case of a locally advanced tumor, due to rapid growth, a focus of necrosis is formed in the center, which leads to low

information content of the material obtained by biopsy. A multifocal biopsy is required to obtain an adequate biopsy volume that reflects the full cellular composition of the tumor. It is necessary to take into account the sonographic picture of the tumor necrosis zone in order not to take material for biopsy from this area. Core-core biopsy is technically simple, associated with a small number of complications [11].

If the first attempt of a core-needle biopsy of a pelvic tumor under ultrasound guidance is ineffective, a second attempt or the use of various open biopsy techniques is possible. The "gold standard" is diagnostic laparoscopy.

Conclusion

Ultrasound-guided core-needle biopsy of a pelvic tumor is a safe and reliable method of morphological verification, characterized by high diagnostic accuracy. The overall effectiveness of the technique is 83%. In the presence of a zone of tumor necrosis, the use of multifocal biopsy increases the information content of the biopsy material. In the group of patients with suspected lymphoproliferative disease, complicated by the course of the tumor process, if the first attempt at core-biopsy is not informative, laparoscopic or open biopsy of the tumor is indicated. For the final morphological verification of the diagnosis, it is extremely important not only to obtain an adequate amount of biopsy material, but also to conduct an adequate histological examination using all the necessary auxiliary methods for assessing the histological preparation.

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