
Diagnostics of Ovarian Tumours by Means of Fine-needle Ultrasound-controlled Transvaginal Biopsy

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The aim of the work was to elucidate the significance of ultrasound-controlled transvaginal biopsy, evaluate the morphogenesis of ovarian tumours and establish the place of the work in diagnosing ovarian tumours. 115 patients with puncture for malignant formations in the small pelvis or a biopsy ultrasound-controlled have been investigated. Totally, 81 punctures, 28 biopsies and 6 both punctures and biopsies have been performed. The investigation yielded the following indications:

1. Clinical diagnosis remained still not clear in 43 (37.4%) of the patients.
2. The analyses made did not answer the main question whether the tumour was malignant or benign – 11 (9.6%) cases.
3. Cytological and histological samples were indispensable for the morphogenesis of the tumour to be revealed, as the tactics of management was not clear – 32 (27.8%) cases.
4. There existed a lateral cystic formation with no signs of malignancy which did not disappear after 2 menstrual periods or was present during the menopause – 20 (17.4%) cases.
5. Suspected ovarian tumour recidivosum in the small pelvis – 9 patients (7.8%).

Totally, 70 patients were handled surgically and tested retrospectively on the basis of the histological findings postoperatively. Hyperdiagnostics was observed in 3 cases and hypodiagnosics in 8. The methods of investigation are presented and the results obtained are discussed. Sensitiveness of the method was established to be 87.8%, specificity 89.2%, positive prognostic value 95.0%, negative prognostic value 75.5%, diagnostic accuracy 88.2%.

Conclusions: the employment of ultrasound-controlled transvaginal puncture in diagnosing ovarian tumours is undoubtedly a beneficial method of investigation; the method of ultrasound-controlled transvaginal puncture should be more extensively employed in diagnosing ovarian tumours; to improve the accuracy of the method, a close cooperation among the echoscopist, gynaecologist and pathomorphologist is needed.

Key words: transvaginal biopsy, ultrasound, ovarian tumours

INTRODUCTION

Diagnostics of ovarian tumours is and remains an urgent point in oncogynaecology. According to the data recorded, in 1996 in Lithuania 379 cases with ovarian tumours were revealed, 249 (65.6%) of which were stages III–IV; in 2000 there were 406 cases, of them 282 (69.5%) were stages III–IV. This fact predetermines deplorable results of treatment. Transvaginal puncture biopsy and cytological examination have long been known to be used in detecting tumours in the small pelvis. This method was known

to be performed blindly, palpating and puncturing the tumour formations in the small pelvis transvaginally.

Already in 1968 puncture diagnostics when dealing with the uterine inflamed appendices was used in Lithuania (1). Only by finger puncturing 272 patients were examined. Puncturing was performed through the lateral vaginal dome harbouring the tumour. No complications were observed. Fine needle aspirate biopsy and cytological examination for ovarian tumours were described in medical literature (2). In total, 80 patients were examined. All tumours

were punctured blindly palpating transvaginally. The diagnostic accuracy according to the authors was 93–95%. A possibility to classify ovarian cancers was seen in 52 cases. The author underlines the method to be a routine one and to be commonly used in many oncological departments in Sweden. The examination is stated to be very simple and the results obtained clinically to be very beneficial. Identical studies were made and similar results obtained by other authors (3). This sort of testing does not require an operation-room, general anaesthesia, and there is a little risk of complications. Also, there have been 177 punctures performed suspecting malignant gynaecological tumour recidivism. The specificity of the method was 100%, its sensitiveness being 68%, negative prognostic value 32%, positive prognostic value 100% and the rate of complications less than 1% (4). With the advance of the ultrasound technique, punctures became possible to be performed ultrasound-guided. This enhances the accuracy of the puncture site and simultaneously improves the results. Methods of dealing with the tumour formations in the small pelvis by means of the puncture technique under ultrasound control were also presented in literature (5). In separate ovarian tumours, the cytological picture obtained at the time of puncture biopsy is in detail given by authors (6). It must be borne in mind that it is one of the most difficult differential cytological testings. Of great importance is the problem of metastatic ovarian tumours. Tumours in the ovaries make up 22.7% of all synchronic tumours (7). When dealing with such problematic cases, transvaginal puncturing controlled by ultrasound is suggested to clear up the diagnosis (10). It is pointed out that small-size tumour formations in the small pelvis, which are spotted only by ultrasound may be punctured too (8).

The diagnostic problem of ovarian tumour recidivism following oncological operations or radiation therapy is of particular urgency. In these cases puncturing may be helpful in detecting early recidivism, especially if it is combined with radioimmune CA-125 (8, 9). Puncturing is also suggested when diagnosing recidivisms. The authors note that the method yields rare complications and is one of the best methods in diagnostics. The results obtained show no confirmation of dissemination of ovarian tumour malignant cells when using transvaginal puncturing (12).

Cystic ovarian formations which persist longer than two menstrual cycles compose a separate problem. The only solution in such cases is transvaginal puncturing controlled by ultrasound (13). Lately punctures and drainage have successfully been used when handling inflamed formations in the small pelvis (14). However, further improvement of the method is obligatory (15).

The aim of the work was to evaluate the significance of transvaginal biopsy controlled by ultrasound, simultaneously assessing the importance of the morphogenesis of ovarian tumours, and to establish the place of the work in the content of ovarian tumour diagnostics.

MATERIALS AND METHODS

Ultrasound testing was performed by means of a Hewlett Packard apparatus, Convekcin 3.5 MHz and the vaginal 7 MHz frequency sensing elements. At first transabdominal ultrasound investigation is carried out. The patient's urinary bladder must be full, covering the uterus to the bottom. The urinary bladder pushes the bowels and makes a "window" for the examination. The tumour formation in the small pelvis having been assessed, the condition of the liver, kidneys and the paraaortic space are evaluated, too. Performing the transvaginal examination, the urinary bladder must be empty. The inner structure of the tumour, its relationship with the adjacent tissues, and the blood vessels on the puncture pathway are additionally assessed. In case of a cystic formation aspirate puncturing and cytological testing are performed, while in the event of a solid formation puncturing is performed and a biopsy for histological and cytological investigation is obtained. Puncturing is usually performed under local anaesthesia (Sol. Novocaini 0.5% – 20.0), the drug being infused into the vaginal dome at the site of the puncture. The procedure requires two sorts of needles: Chiba aspirate puncture needle 0.6 mm – 23 Ga or 0.95 mm – 19 Ga, or in the case of a solid tumour a biopsy cut needle 0.9 mm – 20 Ga is used. Performing the puncture, a special conductor placed on an ultrasound vaginal sensing element is employed and the puncture "path" is established on the monitor. The work embraces the findings of 115 patients that had experienced ultrasound-guided transvaginal puncture.

As is seen from the table, the patients' age was distributed evenly. The sameness of the fluctuation between the ages 30 to 70 years can be explained by the fact that patients at this age are inclined to

Table 1. **Distribution of the patients according to age**

Age	Number of patients	% (95% PI)
21–30	0	0
31–40	24	21.3 (13.0–32.5)
41–50	28	24 (15.2–35.5)
51–60	20	17.3 (9.9–28.1)
61–70	23	20 (11.9–31.1)
over 70	20	17.3 (9.9–28.1)

numerous ovarian tumours. The investigation was carried out according to the following criteria:

1. The investigation failed to reveal a clinical diagnosis in 43 patients (37.4%).

2. The tests did not yield the answer to the key problem whether the tumour was benign or malignant in 11 patients (9.6%).

3. Cytological or histological samples were necessary for the morphogenesis of the tumour to be clarified, as the tactics of the management was not clear in 32 patients (27.8%).

4. There were cases with lateral cystic formations bearing no signs of malignancy and not disappearing after two menstrual cycles or they were evident during the menopause period – 20 patients (17.4%).

5. Suspecting ovarian tumour recidivism in the small pelvis – 9 patients (7.8%).

RESULTS AND DISCUSSION

Table 2 shows that more than ¼ of the patients had no complaints, though tumour manifestations were known to be evident in the interior of the genitalia and the diagnosis was infrequently not clear. The patients had to undergo transvaginal puncturing for diagnostic purposes. The most common complaint was abdominal pains which were present in 72 (62,6%) patients, and this applies to more than every other patient. It is interesting to emphasize that the pain was often difficult to localize and it was of slight intensity. Other complaints were unusual and not typical of ovarian tumours.

The size of the most frequently determined neoplastic formations ranged from 5 to 10 cm (65.2%), whereas those up to 5 cm were found to make 14.6%, *i.e.* the neoplastic formations punctured were not very large.

It is very difficult to group the punctured formations on the basis of ultrasound picture so as the indications of the puncture could be reflected, these

Complaints	Number of patients	%, (95% CI)
Absence of complaints	32	27.8 (18.5–39.7)
Abdominal pains	72	62.6 (50.6–73.3)
Enlargement of abdomen	9	7.8 (3.3–17.2)
Bleeding from genitalia	11	9.5 (4.1–18.8)
Pains in the small of the spine	5	4.3 (1.0–12.0)
Irregular menstruations	5	4.3 (1.0–12.0)
Other complaints	10	9.3 (4.1–18.8)

Size of the tumour	Number of patients	%, (95% CI)
Up to 5 cm	17	14.7 (7.8–25.0)
5–10 cm	75	65.2 (53.3–75.7)
10–15 cm	20	17.3 (9.9–28.1)
15–20 cm	3	2.6 (0.4–10.0)

Ultrasound picture	Number of patients	%, (95% CI)
Hypoechoogenic formation with smooth inner walls	25	21.7 (16.1–42.1)
Hypoechoogenic formation with thin inner septa	36	31.3 (19.2–54.3)
Hypoechoogenic formation with inner echostructures	34	29.5 (18.6–46.3)
Neoplastic formation of cystic-solid structure	9	7.8 (2.6–18.4)
Formation of solid structure	11	9.5 (3.1–21.2)

indications very frequently being influenced by the clinic of the disease and the investigations performed. Seventy patients (60.8%) having hypoechoogenic formations with inner septa and internal echost- ructures were found to be most problematic. Not infrequently these tumours are followed by thickened walls and a vague clinical picture.

In nearly half (45.1%) of the patients the biopsy results confirmed the diagnosis of ovarian tumours. The diagnosis of cancer was varified in 19.9% of the patients by a cytologic investigation. This enables to choose a proper therapy in each case. The

Cytologic results	Number of patients	%, (95% CI)
Adenocarcinoma cells	21	18.2 (10.9–29.7)
Destructed carcinoma cells	2	1.7 (0.07–8.21)
No cancerous cells found	18	16.6 (8.9–26.7)
Signs of the cyst	32	27.8 (18.5–39.7)
Erythrocytes in the background of the liquid	14	12.1 (6.0–22.1)
Elements of inflammation	6	5.2 (1.72–13.8)
Mesothelium cells	3	2.6 (0.5–10.2)
Muscular cells	2	1.7 (0.07–8.21)
Non-informative material	14	12.1 (6.0–22.1)

Pathohistological results	Number of patients	%, (95% CI)
Adenocarcinoma	15	45.1 (15.3–77.3)
Endometriosis	11	32.3 (9.02–69.1)
Fragment of smooth muscles tissue	4	11.7 (0.68–49.3)
Fibrotic tissue	4	11,7 (0,68 – 49,3)

cytological and histological detection of cancerous cells allows starting chemotherapy management, rejecting the primary surgical treatment previously thought about. In case the somatic condition of the patient is very poor and the cancer diagnosis is not proved by cytological and histological investigations, the patients may be left for observation. The diagnosis becomes clear on receiving a purulent content during the puncture, though clinically the picture resembles ovarian cancer. The antiinflammatory therapy is administered. In case endometriosis is diagnosed, a conservative hormonal treatment and further follow-up of the patient may be applied.

Operation	Number of patients	%, (95% CI)
Extirpatio uteri cum adnexis	49	70 (54.4–81.3)
Amputatio uteri cum adnexis	9	12.8 (5.1–25.5)
Adnexectomy	11	15.7 (7.8–30.2)
Laparotomy	1	1.4 (0.1–12.2)

Operations were performed on 70 patients, of them 82.8% underwent radical surgery, which was of particular importance in case of ovarian cancer. On the basis of the final diagnosis and histological investigations these patients could have been given retrospective analysis with the evaluation of the effectiveness of the transvaginal puncture procedure.

The diagnosis coincided in 58 patients (82.8%), while in 12 cases (17.2%) it did not, out of which hyperdiagnostics was noted in 3 cases (4.2%) and hypodiagnosis in 8 cases (11.4%). On the basis of these findings in the transvaginal puncture control the sensitivity of 87.8%, specificity of 89.2%, positive prognostic value of 95%, negative prognostic value of 75.7%, diagnostic accuracy of 88.2% were determined. Thus, this method was found to be rather effective. In 95% of cases it was likely that in case the test was positive, the patient undoubtedly

had the disease, however, in 75.7% of cases, the test being negative, it was unlikely that the patient suffered from a malignant ovarian tumour. These indices are sufficiently high. It should be pointed out that on introducing transvaginal puncture into medical practice the deviations were found to be markedly higher. The improved working skills and closer cooperation of the echoscopist, gynaecologist and histologist allowed to improve greatly the preciseness of the results. In 115 transvaginal punctures performed, no complications in the puncture ultrasound control have been observed.

CONCLUSIONS

1. The ultrasound-guided transvaginal puncture in ovarian cancer diagnostics has been found to be an undoubtedly useful method.
2. The method of ultrasound-controlled transvaginal puncture should be used on a wider scale in the ovarian tumour diagnostics.
3. To improve the accuracy of the method, a closer cooperation of the echoscopist, gynaecologist and pathomorphologist is obligatory.

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KIAUŠIDŽIŲ NAVIKŲ DIAGNOSTIKA NAUDOJANT ULTRAGARSU KONTROLIUOJAMĄ TRANSVAGINALINĘ PLONOS ADATOS BIOPSIJĄ

S a n t r a u k a

Šio darbo tikslas – išsiaiškinti transvaginalinės biopsijos, kontroliuojamos ultragarsu, reikšmę įvertinant kiaušidžių navikų morfogenezę bei nustatyti šio tyrimo vietą kiaušidžių navikų diagnostikoje. Iš viso šiame darbe ištyrėme 115 ligonių, kurioms atlikta navikinių darinių mažajame dubenyje punkcija ar biopsija naudojant ultragarso kontrolę. Iš viso atlikta 81 punkcija 28 biopsijos ir 6 punkcijos kartu su biopsija. Tyrimas buvo atliktas pagal šias indikacijas:

1. Atlikus tyrimus klinikinė diagnozė neaiški – 43 ligonės (37,4%).

2. Atlikti tyrimai neatsako į pagrindinį klausimą: piktybinis ar nepiktybinis navikas – 11 (9,6%).

3. Būtinai citologinis ar histologinis medžiagos paėmimas naviko morfogenezei nustatyti, nes neaiški gydymo taktika – 32 (27,8%).

4. Vienpusis cistinis darinys be malignizacijos požymių neišnykstantis po 2 menstruacinių ciklų arba esantis menopauzės laikotarpiu 20 (17,4%).

5. Įtariant kiaušidžių vėžio recidyvą mažajame dubenyje – 9 (7,8%). Iš viso operuota 70 ligonių ir atlikta analizė retrospektyviai remiantis pooperacinio histopatologinio tyrimo atsakymu. Hiperdiagnostika stebėta 3, hipodiagnostika – 8 atvejais. Straipsnyje pateikiama darbo metodika, aptariami gauti rezultatai. Nustatėme, kad metodo jautrumas – 87,8%, specifiškumas – 89,2%, teigiama prognozinė testo vertė – 95,0%, neigiama prognozinė testo vertė – 75,7%, diagnozės tikslumas – 88,2%.

Išvados:

1) transvaginalinės punkcijos kontroliuojamos ultragarsu, panaudojimas kiaušidžių navikų diagnostikoje yra neabejotinai naudingas tyrimo metodas,

2) šį metodą reikia plačiau taikyti kiaušidžių navikų diagnostikoje,

3) siekiant pagerinti metodo tikslumą, būtinas glaudus echoskopuotojo, ginekologo ir patomorfologo bendradarbiavimas.

Raktažodžiai: transvaginalinė biopsija, ultragaras, kiaušidžių navikai