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# "Benefit" of Routine Ovarian Biopsy during Laparotomy for Diseases of the Female Reproductive Organs

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## Abstract

**Background:** Ovarian cancer is the most common cause of death among patients diagnosed with reproductive organ cancers in Poland. Despite the progress and continual improvements in diagnostic techniques and methods of cancer treatment, the epidemiology and natural history of ovarian cancer remain largely unchanged. Approximately three quarters of ovarian carcinoma cases are not detected or treated until the third or fourth stage of the disease. The current routine diagnostic procedures include ultrasound examination, biochemistry marker assessments and histopathological evaluations of ovarian tissue to confirm a diagnosis. The preoperative diagnosis of ovarian cancer remains unsatisfactory, and the search for new effective methods has not provided satisfactory results.

**Objectives:** To determine whether routine biopsy of macroscopically unchanged ovaries provides sufficient benefit.

**Material and methods:** We conducted a clinical trial involving approximately 1,000 ovaries from which tissue samples were collected during reproductive organ surgeries, and the tissues were examined by a pathologist. Spearman's rank correlation was used to compare the results statistically.

**Results:** The results of the histopathological evaluation of macroscopically unchanged ovaries were normal in 99.8% of patients.

**Conclusion:** In this context, routine biopsy of macroscopically unchanged ovaries does not provide sufficient benefit. Moreover, it may be associated with increases in surgical complications such as bleeding from the biopsy site. Therefore, biopsy of the ovaries during surgery of reproductive organs should not be performed routinely unless cancer is suspected.

**Keywords:** Ovarian cancer; Biopsy; Laparotomy; Laparoscopy; Staging

## Introduction

Ovarian cancer is the most common cause of death among patients diagnosed with reproductive system cancers in Poland and constitutes approximately 25% of all tumours of the female reproductive organs. The International Agency for Research on Cancer (Lyon) as well as the National Cancer Institute (Bethesda, USA) reported approximately 192,000 new cases of ovarian cancer worldwide in 2000, with an estimated 114,000 (59.375%) deaths. Despite the progress and continuous improvements in diagnostic techniques and methods of cancer treatment, the epidemiology and natural history of ovarian cancer remain largely unchanged. The 5-year survival for all ovarian cancers remains between 30% and 40%. As with all tumours, it is extremely important to detect pathological changes during the earliest stages. The detection of early stage disease dramatically affects the outcome, as early intervention can alter the natural history in some cases. Unfortunately, because of the well-described vague and subtle nature of the symptoms, approximately three quarters of ovarian cancer cases are not detected or treated until the third or fourth stage of the disease. Screening techniques, including laboratory examinations, have not been shown to aid the preoperative detection of malignant changes in the adnexa. Presently, preoperative detection of pre-cancerous changes is unrealistic, particularly because a tumour may appear in macroscopically normal ovaries. Histopathological evaluation of ovarian tissue remains the gold-standard technique to confirm a diagnosis of ovarian cancer, but clearly requires adequate tissue samples. For some time, macro- and microscopic evaluations of the ovaries have been suggested at laparotomy/ laparoscopy for conditions other than ovarian disease.

The routine sampling of ovarian tissue during laparotomy for other gynaecological indications is being carried out at some centres but is still controversial.

## Objectives

The aims of this study were to retrospectively evaluate the histology of ovarian tissue taken from macroscopically normal ovaries at laparotomy performed for non-malignant changes in female reproductive organs and to assess the potential benefit of this practice.

## Materials and Methods

All patients attended the Clinic of Obstetrics, Gynaecology and Oncological Gynaecology, Nicholas Copernicus University in Toruń, Collegium Medicum in Bydgoszcz. Between 1998 and 2004, 607 patients underwent laparotomy (511) or laparoscopy (96) for non-malignant changes in the uterus or adnexa. These patients had sections

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of ovarian tissue collected for histological analysis after full informed consent was obtained from each patient. We have obtained the consent of the bioethical commission. For the statistical analysis, Spearman's rank correlation was used to compare the results.

## Results

At the time of surgery, 75% of the women were aged 31-50 years. The mean age of the patients was 42 years (range 7-77 years). Patients aged 41–50 years comprised the largest age group (320; 53%), followed by those aged 31-40 years (136; 22.4%). Only 84 patients (14%) were older than 50 years (Table 1).

Fifty-two abdominal hysterectomies and four vaginal hysterectomies were performed. Supra-cervical amputation of the uterus was performed in 293 patients (48%), without removal of the adnexa in 280. Uterine myomas were excised from 87 women. In 106 patients (17%), the adnexa were removed (54 right-sided and 52 left-sided). Ovarian cysts were excised from 59 women (11%), nearly twice as often on the left side as on right side. The indications for surgery were uterine myoma in 412 patients (68%), which was confirmed histopathologically, and ovarian changes on pre-surgical screening in 171 patients (29%). The remaining 24 patients were operated on for other reasons.

Macroscopic changes were found in only one ovary in 157 patients (26%) and in both ovaries in only 5 patients (<1%). Tissue segments were collected from both ovaries of 369 patients (62% of the total; 317 laparotomies and 52 laparoscopies), from the right ovary only of 122 patients (20%; 101 laparotomies and 21 laparoscopies), and from the left ovary only of 116 patients (18%; 93 laparotomies and 23 laparoscopies) (Table 2).

Material from macroscopically normal ovary pairs of 369 patients was evaluated, of which 238 sections were histologically reviewed for this study. Macroscopically abnormal ovary sections were reviewed as part of the clinical evaluation. At the same time, the histopathological examination results for 976 ovaries (samples) without noticeable changes were analysed in diagnostic examinations or by the surgeon to detect macroscopic changes. For the ovaries with macroscopic changes, segments were also removed for examination, but the results have been excluded from this publication. The histopathological evaluation results of the 976 macroscopically unchanged ovaries were normal in 99.8% of patients. Only one patient had a histologically confirmed endometrioid ovarian cancer (Table 3). This patient (49 years old) underwent supracervical hysterectomy for a myoma without removal of the ovaries. During laparotomy, a small cyst was excised from the right ovary and was later found to be a chocolate cyst. The segment taken from the macroscopically normal left ovary revealed the cancer.

| Patient age group | Number | % |
|---|---|---|
| ≤ 20 | 10 | 1.6 |
| 21-30 | 57 | 9.4 |
| 31-40 | 136 | 22.4 |
| 41-50 | 320 | 52.7 |
| 51-60 | 75 | 12.4 |
| >61 | 9 | 1.5 |
| Total | 607 | 100 |

**Table 1:** Numbers of surgical patients in each age group.

## Discussion

Despite the very low probability of finding pathology by routine sampling of ovaries that appear normal, the diagnostic and therapeutic difficulties as well as poor prognosis of ovarian cancer continue to cause debate concerning the best clinical course of action for this cancer [1-7]. Most cases of malignant ovarian cancer require radical surgery with bilateral removal of the adnexa [8,9]. In young women or those wishing to preserve some ovarian function, it is possible to remove only the abnormal ovary [10-13]. In this highly selected group of patients, preservation of fertility is an option via fertility sparing surgery, in which it is necessary to collect specimens from the remaining ovary. In such cases, there is no question of removal of segments from the macroscopically normal ovary, because ovarian cancer pathology is presumed to exist in one ovary already [13-15]. There is histological evidence of malignancy in approximately 0-12% of the contralateral macroscopically normal ovary [16-18]. The decision regarding whether hysterectomy and removal of the macroscopically normal ovary should accompany resection of a malignant ovary necessitates careful discussion with the patient [9,19-21]. However, does this risk justify routine sampling of ovarian tissue during surgery for reasons other than ovarian malignancy? Proponents of routine intraoperative sampling of "normal" ovaries continue to claim easy accessibility and minimal risk when weighed against the incidental, but potentially life-saving, detection of histological ovarian malignancy [5,22,23]. This diagnostic "ease and ready availability" may seem tempting, given the silent nature of ovarian malignancies. However, as our data clearly demonstrate, biopsy of tissue from a normal organ without additional risk factors for malignancy seems entirely unjustified. Routine screening of macroscopically normal ovaries during laparotomy cannot be justified given the overwhelmingly normal histological findings [24,25].

Although this study did not formally assess the complications

| Surgical procedure | | Number | Final number | % |
|---|---|---|---|---|
| Supracervical hysterectomy without adnexa | | 280 | 293 | 48.3 |
| Supracervical hysterectomy with adnexa | Right | 4 | | |
| | Left | 9 | | |
| Removal of adnexa | Right | 54 | 106 | 17.5 |
| | Left | 52 | | |
| Uterine myomectomy | | | 87 | 14.3 |
| Hysterectomy without adnexa | Abdominal | 52 | 56 | 9.2 |
| | Vaginal | 4 | | |
| Removal of ovary cyst | Right ovary | 19 | 59 | 9.8 |
| | Left ovary | 35 | | |
| | Both ovaries | 5 | | |
| Other | | | 6 | 0.9 |
| Total | | | 607 | 100 |

**Table 2:** Numbers and percentages of patients according to type of surgical procedure.

| Side of sample | Number | % | Histopathological result |
|---|---|---|---|
| Both ovaries | 369 | 60,8 | Normal tissue |
| Right ovary | 122 | 20.1 | |
| Left ovary | 115 | 18.9 | |
| | 1 | 0.2 | Endometrial cancer of the ovary |
| Total | 607 | 100 | X |

**Table 3:** The results of histopathological evaluation of macroscopically unchanged normal ovaries.

associated with the sampling of ovarian tissue, such complications have been reported in the literature [2,26,27]. In our study alone, the additional costs incurred from histological examination of normal tissue are significant even on a local scale. Therefore, the authors conclude that targeted sampling of abnormal ovaries detected during preoperative screening or laparotomy is the appropriate and correct practice. Routine sampling of normal ovaries is not warranted [1,3,14,20,27].

Clearly, early detection of ovarian malignancy remains a challenge. This study confirms that other, more focused methods of detection must be developed if the high mortality from this disease is ever to be decreased.

## Conclusion

There are no benefits to routine ovarian biopsy during surgery for diseases of the female reproductive organs. It does not improve the detection of early stage ovarian cancer and may unnecessarily increase the costs of treatment.

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