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นิพนธ์ต้นฉบับ

## Accuracy of the frozen section technique in ovarian neoplasms.

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*In a study of the frozen section biopsies of 50 ovarian neoplasms, the results were correct in 90 %, incorrect in 4 % , and inconclusive in 6 % of the 50 cases. The "incorrect" results were all "false-negative", owing to errors in block selection and the small area of malignant change detected by paraffin block techniques only. Deferred diagnosis occurred mainly under gynecological conditions where diagnosis was difficult, required extensive sampling or a formal mitotic count was made. The use of frozen section biopsies of ovarian neoplasms is plausible as long as pathologists can be provided with the proper equipment during surgery. Our study suggests that, in the management of the lesion, frozen section technique is necessary in patients younger than 40 years.*

**Key words :** *Frozen section, Ovarian neoplasma.*

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สุรางค์ ตริรัตนชาติ, ประสาร จิมากร. ความแม่นยำของวิธีตัดชิ้นเนื้อในระหว่างผ่าตัดด้วยวิธีแช่แข็งในผู้ป่วยเนื้องอกของรังไข่ 50 ราย. จุฬาลงกรณ์เวชสาร 2537 มกราคม; 38(1) : 9-13

การนำเทคนิคการตัดชิ้นเนื้ออย่างรวดเร็วด้วยวิธีแช่แข็งมาใช้ ในรายเนื้องอกของรังไข่ 50 ราย ที่ภาควิชาสูติศาสตร์ นรีเวชวิทยา จุฬาลงกรณ์มหาวิทยาลัย มีความถูกต้องในการวินิจฉัย 90 เปอร์เซ็นต์ ไม่ถูกต้อง 4% และสรุปผลไม่แน่นอน 6% รายที่วินิจฉัยไม่ถูกต้องนั้นทั้งหมด เป็นรายที่วินิจฉัยว่าไม่เป็นมะเร็ง โดยที่ผลจากการตรวจด้วยวิธีปกติเป็นมะเร็งเนื่องจากไม่พบมะเร็งในบริเวณที่ตรวจด้วยวิธีแช่แข็ง ส่วนรายที่สรุปผลไม่แน่นอนในการวินิจฉัยนี้ พบในรายที่เป็นมะเร็งรังไข่ชนิดที่พบน้อย การวินิจฉัยทำได้ยาก และยังต้องการเวลาในการนับจำนวนเซลล์ที่กำลังแบ่งตัวในก้อนเนื้องอก เพื่อการวินิจฉัยที่ถูกต้องอีกด้วย ดังนั้นจะเห็นได้ว่าการตัดชิ้นเนื้ออย่างรวดเร็วด้วยวิธีแช่แข็งนี้จะสามารถนำมาประยุกต์ใช้กับคนไข้เนื้องอกของรังไข่ได้อย่างดี โดยจะต้องมีพยาธิแพทย์ที่เชี่ยวชาญ ตลอดจนเครื่องมือในการทำด้วย วิธีการทำดังกล่าวมีประโยชน์อย่างมากโดยเฉพาะในหญิงที่อายุน้อยกว่า 40 ปี เนื่องจากความต้องการในการทำผ่าตัดเพื่อเก็บรักษามดลูกและรังไข่อีกข้างหนึ่งไว้ เพื่อความสามารถในการมีบุตรต่อไป

Frozen section biopsy has been widely used in mammary<sup>(1)</sup> pathology. For other neoplasms of the female genital system, especially in ovarian neoplasms, is believed that the heterogenic nature of the tumors would be responsible for a high percentage of errors.<sup>(2)</sup> During laparotomy for an ovarian mass, a situation may arise when the surgeon, depending on the gross appearance of the mass, cannot decide with certainty about the benignity of the ovarian neoplasm. The histological diagnosis is no doubt influenced by the line of management : conservative versus radical surgery. For some women, preservation of the uterus and the remaining ovary can be vital. This study was undertaken because the need for an instant answer during the operation is an indispensable prerequisite.

### Patients and methods

Fifty patients diagnosed with ovarian neoplasms were operated on from June 1992 to May 1993 at the Department of Obstetrics and Gynaecology, Chulalongkorn University. At laparotomy the tumors were excised ; the lesions which proved to be non-ovarian were excluded. On the other hand, 50 ovarian masses were subjected to quick diagnostic methods (frozen section) followed by routine paraffin sections. The specimens were removed from representative pieces ranging from one to three slides per

case. The sections were cut on cryostat at 6 µm and stained with hematoxylin and eosin. The frozen sections were then placed with the rest of the specimens and fixed with 10 % formaldehyde solution for paraffin sections, stained by H & E and examined in order to make the definitive pathologic diagnosis.

The diagnoses were classified as (a) "false-positive" when the frozen section was reported as malignant, and the paraffin section was benign; (b) "false-negative" when the frozen section was reported as benign and the paraffin section was malignant; (c) "deferred" when diagnosis was inconclusive on frozen section; (d) "inaccurate" when the pathologist correctly reported the frozen section as benign or malignant, but did not make a "correct" classification of the histology; and (e) "correct diagnosis" when the frozen section and paraffin section were the same whether benign or malignant and the correct classification of the histology was made.

### Results

Of the neoplasms studied, 21 were malignant and 29 were benign. Table 1 show the patients with malignant and benign neoplasms by age group. The histologic classification of the 21 malignant neoplasms is shown in Table 2 and then of the benign neoplasms in Table 3

**Table 1.** Distribution of patients with malignant and benign ovarian neoplasms, by age group.

Age (years)	No. malignant	No. benign
< 20	4	4
21-30	5	3
31-40	2	8
41-50	6	5
51-60	3	4
61-70	-	4
71-80	1	1

**Table 2.** Histologic classification of the 21 malignant neoplasms.

Classification	No.
Serous cystadenocarcinoma	2
Mucinous cystadenocarcinoma	2
"Borderline" mucinous cystadenocarcinoma	5
Endometrioid carcinoma	2
Clear cell adenocarcinoma	1
Adenosquamous carcinoma	1
Embryonal cell carcinoma	1
Mature cystic teratoma with area of squamous cell carcinoma	1
Immature teratoma	2
Endodermal sinus tumor	1
Metastatic tumor	2
Others: squamous cell carcinoma	1

**Table 3.** Histologic classification of 29 benign neoplasma.

Classification	No.
Mature cystic teratoma	7
Endometrioma	5
Serous cystadenoma	6
Mucinous cystadenoma	8
Struma ovarii	2
Fibrothecoma	1

In the 50 tumors there were 33 surface epithelial tumors (19 benign, 5 borderline, 9 malignant), 14 germ cell tumors (9 benign, 5 malignant), 1 benign stromal cell tumor, and 2 metastatic tumors. Results of the frozen section examinations of the specimens showed 31 benign tumors and 16 malignancies, while there were 13 inconclu-

sive cases. A comparison of the results of the frozen section biopsies with those obtained by definitive histology is shown in table 4. The results categorized as deferred or incorrect after definitive histologic examination are shown in table 5.

**Table 4.** Comparison of the results of frozen section biopsy with those obtained by definitive histology.

Correct diagnosis	33/50	(66 %)
Inaccurate	12/50	(24 %)
Incorrect	2/50	(4 %)
Deferred	3/50	(6 %)

**Table 5.** Frozen section biopsy results categorized as deferred or incorrect after definitive histologic examination.

	Incorrect	Deferred
Struma ovarii	-	1
Endodermal sinus Tumor	-	1
Mucinous cystadenoma	-	1
Metastatic Endometrial carcinoma	1	-
Squamous cell carcinoma in dermoid cyst	1	-

The accuracy of the frozen section method was 90 %, including both correct diagnosis and inaccurate.

As 40 years of age is considered to be the end of a woman's reproductive period, the number of ovarian neoplasms that occurred before that age becomes important. In our series among women younger than 40, there were 11 malignant tumors and 14 benign neoplasms. The frozen section biopsy results were correct in 23 cases (92 %), deferred in 2 cases (8 %) with no incorrect case.

## Discussion

In this study, frozen section for ovarian neoplasms was found to be reliable and valuable. An accurate diagnosis was made in 90 % of the cases, which compared favorably with the 88-94.16 %<sup>(2,3)</sup> accuracy obtained recent study.

False-negative diagnosis was 4 %. Significantly, there was no false-positive result causing unnecessary radical or re-operation. The sensitivity and specificity of this series were 90 % and 100 %, respectively. Accuracy excluding the deferred cases was 95.74 %.

In gynecologic surgery, the use of frozen section technique is indicated for assessing the malignancy of an ovarian or other pelvic tumor, determining lymph node involvement for radical procedures and ruling out bilaterality in certain ovarian tumors with the hope of avoiding oophorectomy.<sup>(4)</sup> For the last reason, it is interesting to note the results in younger women, the accurate diagnosis of whom was 92 % more than the overall group, with no false-negative result.

The incorrect results in this study occurred in cases of metastatic endometrial carcinoma of the ovary and squamous cell carcinoma deriving from mature cystic

teratoma. The lesions seemed to be focality in both cases, detected only by subsequent pathological study.

The use of frozen section for detecting ovarian neoplasms is plausible, requiring only proper equipment and an experienced pathologist. In patients younger than 40 years in whom conservative surgery seems to be indicated, <sup>(2)</sup> diagnosis has been show to be more accurate (92 % vs 90 %) with a lower percentage of incorrect-diagnosy (0%vs4%).

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