

# Frozen Section in Postmenopausal Women Presented with Suspicious Ovarian Masses, Does It Have a Role?

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Received 6 November 2015; accepted 7 December 2015; published 10 December 2015

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## Abstract

**Background:** Frozen section (FS) has a valuable role in the diagnosis of ovarian tumors. It is considered a pivotal point in guiding the surgical therapy, particularly in premenopausal women. In postmenopausal women, it may be required as well to avoid unnecessary surgical staging in benign ovarian tumors. **Aim:** This study aims to evaluate the accuracy of intraoperative frozen section in ovarian neoplasms in postmenopausal women. **Materials and Methods:** A retrospective analysis was done for intraoperative FS for suspected ovarian neoplasms. The study was conducted in Oncology Center, Mansoura University from March 2008 to December 2014. The frozen and paraffin section reports were compared, and overall accuracy, sensitivity, specificity, positive and negative predictive values were determined. **Results:** The study included 105 patients and the overall accuracy of FS in determining malignancy was 81.7%. The sensitivity for malignant tumors was 75.32% with specificity of 100%. For benign tumors, the sensitivity and specificity were 100% and 93%, respectively. Borderline tumors had the lowest sensitivity of 100% with specificity of 95.19%. **Conclusion:** The present study concurs that frozen section is an accurate test for diagnosis of benign and malignant tumors in postmenopausal women thus determining the extent of surgery done for them. On the other hand, accuracy rates for borderline tumors are low.

## Keywords

Frozen Section, Ovarian Cancer, Surgical Staging

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**How to cite this paper:** Refky, B., Gamal, A., Hamed, E., Fathi, A., Arafa, M., Roshdy, S., Gaballa, K., Attia, E., Abdelkhalek, M., Hafez, M.T., Shahatto, F., Awny, S., Shokry, D. and Tawfik, G. (2015) Frozen Section in Postmenopausal Women Presented with Suspicious Ovarian Masses, Does It Have a Role? *Journal of Cancer Therapy*, 6, 1192-1195.  
<http://dx.doi.org/10.4236/jct.2015.614129>

## 1. Introduction

It is not easy to diagnose ovarian malignancy preoperatively due to avoiding of performing a preoperative biopsy for fear of capsule rupture and tumor spillage [1]. Ovarian cancers have the percentage of 4% of all cancers affecting females [2]. Nearly half of females (48%) who are affected by malignant ovarian neoplasms are in the postmenopausal period [3]. They are considered one of the commonest causes of death among females [2] [4]. The majority of cases are diagnosed late and thus aggressive surgical management has to be performed [4]. In case of postmenopausal patients with ovarian cancer, sparing fertility is not the issue of importance but the surgical staging procedure will change according to the histopathology, for malignant ovarian tumors' complete surgical staging should be performed including omentectomy, lymphadenectomy, peritoneal biopsies and sometimes appendectomy which has got an impact on the operative time as well as morbidity and even mortality in old women. This can be avoided if we have an accurate histological diagnosis of a benign ovarian tumor pre- or intraoperative. FS is an intraoperative technique for detection pathological typing of ovarian neoplasms either benign, borderline or malignant [5].

## 2. Materials and Methods

The present study was conducted in Oncology Center, Mansoura University from March 2008 to December 2014. A retrospective analysis was performed by reviewing files of postmenopausal patients who underwent surgery as primary line of therapy for suspected ovarian neoplasms. All the frozen section diagnoses were made by a team of expert oncopathologists at the Oncology center. Rational of using frozen section is to select the appropriate management according to the staging of the tumor if benign oophorectomy and if borderline or malignant: panhystrectomy, omentectomy, iliac, para-aortic lymphadenectomy, peritonectomy and even appendectomy. The tissue sections were prepared using the Leica CM1900 cryostat (Leica microsystems, Nussloch, Germany) according to the manufacturer's instructions. Briefly, the surgical specimens were embedded in optimal cutting temperature (OCT) medium, placed on metal tissue discs which were frozen rapidly to minus 30°C. Subsequently, they were cut frozen at about 10 micrometres thickness with the microtome portion of the cryostat. Then, picked up on glass slides and stained with hematoxylin and eosin (H&E). The total required time from the receipt of the specimens to the examination of the tissue sections were about 20 minutes per case. The frozen section and the paraffin section reports of each patient were compared. The frozen section results were divided into the following groups: benign, borderline and malignant. The overall accuracy, sensitivity, specificity, positive and negative predictive values of the frozen section diagnoses were determined according to the status of malignancy.

## 3. Statistical Analyses

Statistical analysis was carried out using SPSS (v.20), categorical variables were presented as frequency and percentages. Agreement of the 2 variables was assessed by symmetric measure by of agreement and was measured by Spearman correlation test. P values below 0.05 were considered significant.

## 4. Results

The study included 105 patients who had undergone frozen section for ovarian masses. The mean age of the patients was 57.3 years (range 46 - 77 years). Diagnosis by frozen section was compared with paraffin section. The final histopathological diagnoses were benign in 27 patients (53.78%), borderline in 1 (0.95%) and malignant in 77 (42.85%) patients. Overall accuracy of frozen section in determining the status of malignancy was 81.7%. The comparison between FS diagnosis and final diagnosis shown is in [Table 1](#). In our study, the sensitivity for benign tumors was (100%) and the specificity was 82.05%. For malignant tumors, the sensitivity and specificity were 75.32% and 100%, respectively. Borderline tumors had a high sensitivity of 100% and a specificity of 95.19% but that may be due to the small number of borderline cases in our study. The positive predictive value for benign was 65.85%, borderline 16.67% and malignant 100%. The negative predictive value was 100%, 100% and 59.57% respectively. The P value of chi square for benign, malignant and borderline was <0.01%, <0.01% and 0.057%, respectively. The statistical values for these three groups are listed in [Table 2](#).

## 5. Discussion

Preoperative biopsy in clinically suspected ovarian masses is not a part of the work up and may be contraindicated

**Table 1.** Comparison between frozen section diagnosis and paraffin diagnosis.

	PS Benign	PS Borderline	PS Malignant	Total
FS Benign	27	0	14	41
FS Borderline	0	1	5	6
FS Malignant	0	0	58	58
Total	27	1	77	105

**Table 2.** Sensitivity and specificity of frozen section in diagnosis.

	Benign	Malignant	Borderline
Sensitivity	100%	75.32%	100%
Specificity	82.05%	100%	95.19%
P value of chi square	<0.01%	<0.01%	0.057%
Positive predictive value	65.85%	100%	16.67%
Negative predictive value	100%	59.57%	100%

**Table 3.** Sensitivity of intraoperative frozen section.

Author	Year	Benign	Borderline	Malignant
Mohammed <i>et al.</i>	2015	100%	72.7%	88.4%
Malipatil & Crasta	2013	99.3%	86.66	84.9%
Suprasert <i>et al.</i>	2008	100%	84.2	92%
Ilvan <i>et al.</i>	2005	100%	87%	87%

due to fear of spillage of tumor cells or capsule rupture. Staging surgery for suspected ovarian masses is a major procedure especially if extending to include omentectomy and lymphadenectomy. Intraoperative frozen section is an important procedure for diagnosis of ovarian tumors enabling the surgeon to choose the correct operation type and avoid over-treatment or under-treatment. That is very important in preserving fertility of young females. As for postmenopausal females, intraoperative frozen section procedure give the ability to avoid either over-treatment or under-treatment but in some cases under treatment can be corrected after make sure by paraffin section. The overall accuracy in our study is 81.7%, this value is less than other values in previous studies which range from (90% to 97%) [1] [6]-[8] but still accepted. The overall accuracy which had shown in previous studies was 93.8% [8], 95.5% [1], 91.85% in [9], 97.1% [5] and this variation may be attributed to our small sample size and the raised age of cases. The sensitivity of benign, borderline and malignant ovarian tumors found 100%, 100% and 75.32%, respectively (**Table 3**), and the specificity was for benign, borderline and malignant 82%, 95.19% and 100%, respectively which correlate with previous studies [1] [6]-[8]. So our study recommended that FS should be done whenever possible in postmenopausal female with equivocal ovarian masses with no definite signs of malignancy either clinically, radiologically or tumor markers.

## 6. Conclusion

The present study concurs that frozen section is an accurate test for diagnosis of benign and malignant tumors in postmenopausal women thus determining the extent of surgery done for them whether limited to hysterectomy or salpingoophorectomy or extending it for complete surgical staging including panhystrectomy omentectomy, iliac and paraaortic lymphadenectomy, peritonectomy and even appendectomy. On the other hand, accuracy rates for borderline tumors are low.

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