RESEARCH COMMUNICATION

Accuracy of Intra-operative Frozen Sections in the Diagnosis of Ovarian Masses

Prapaporn Suprasert¹*, Surapan Khunamornpong², Anchali Phusong¹, Jongkolnee Settakorn², Sumalee Siriaungkul²

Abstract

The accuracy of frozen section diagnosis in the intraoperative evaluation of ovarian masses is very important with regard to surgeon selection of appropriated operating procedures. For evaluation in our institute, the records of 127 patients with ovarian masses submitted for intraoperative frozen sections between January 2001 and December 2005 were reviewed. After exclusion of 4 completely infarcted masses and 11 cases with deferred frozen section diagnoses, 112 were analyzed for diagnostic accuracy by comparing with the final histologic results. We found sensitivity in the diagnosis of benign, borderline and malignant tumors to be 100%, 84%, and 92%, respectively, with specificities of 92.7%, 97.9%, and 100%, respectively. The overall accuracy with frozen sections was 94%. Among 18 patients with deferred or discordant diagnoses, mucinous tumors accounted for 72% of cases. No over-diagnosis of malignancy or misdiagnosis of metastatic lesions as primary ovarian cancer by frozen sections was observed. In conclusion, the accuracy of intraoperative frozen section for the diagnosis of ovarian masses is high. Frozen sections also help in the evaluation of metastatic tumors to the ovary. Mucinous tumors constitute an important group causing diagnostic discrepancies.

Key Words: Ovarian tumours - diagnostic accuracy - frozen sections

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Introduction

Clinically detected ovarian masses have a heterogenous nature, including neoplasms and benign non-neoplastic lesions or cysts. Primary ovarian neoplasms form a complex group of tumors with various histogenetic origins such as epithelial, sex cord-stromal, and germ cell (Scully, 1999). Furthermore, patients with ovarian metastasis from non-genital cancers may have a presentation similar to primary ovarian cancer which contributes to confusion in the diagnosis and inappropriate management (Seidman et al., 2003).

For management purposes, primary ovarian neoplasms are categorized as benign, malignant, and an intermediate group of epithelial neoplasms (borderline tumors). The extent of surgical management is based on the histologic diagnosis and the category of tumors. In benign and borderline ovarian tumor, fertility conserving surgery is a preferred approach, whereas, in malignant tumors, complete surgical staging that involves total hysterectomy, bilateral salpingo-oophorectomy, partial omentectomy and retroperitoneal lymph node sampling should be done (Berek, 2002). For borderline tumors, surgical staging should be performed but with a conservative approach and lymph node sampling may be omitted if the node is not grossly abnormal. Preoperative assessment

Materials and Methods

This study was approved by the research ethics committee. The records of ovarian masses submitted for intraoperative frozen section in the department of Pathology, Chiang Mai University Hospital between January 2001 and December 2005 were retrieved. The request for intra-operative frozen sections was based on the decision of the attending gynecologic surgeons. Intra-
Intraoperative histological assessment of ovarian tumors help clinicians to select an appropriate surgical procedure for the patients, avoiding both undertreatment and overtreatment. The overall accuracy of frozen section diagnosis of ovarian masses in our study, was high (93.8 %) and was within the range of the previous reports (90-97%) (Twaalfhoven et al.,1991; Wang et al.,1998; Gol et

Discussion

Intraoperative histological assessment of ovarian tumors help clinicians to select an appropriate surgical procedure for the patients, avoiding both under- and overtreatment. The overall accuracy of frozen section diagnosis of ovarian masses in our study, was high (93.8 %) and was within the range of the previous reports (90-97%) (Twaalfhoven et al.,1991; Wang et al.,1998; Gol et
In this study, mucinous borderline tumor was the diagnosis most commonly involved in the deferred and discordant categories. Difficulty in the frozen section diagnosis of mucinous tumors and borderline tumors has been well addressed in the recent reports (Houck et al., 2000; Tangjitgamol et al., 2004; Stewart et al., 2006; Tempfer et al., 2007). It has also been suggested that, among the common types of borderline tumors, the diagnostic difficulty is greater in the mucinous type compared to the serous counterpart (Houck et al., 2000; Tempfer et al., 2007). Large tumor size and tumor heterogeneity of mucinous tumors were the main contributing factors of the diagnostic difficulty. In the present study, the mean maximal diameter of the disagreement and deferred cases was significantly larger than the agreement group. Wang et al. (1998) recommended that multiple frozen section samples may help increase the accuracy in the diagnosis and taking one frozen section per each 10 cm diameter of the mass was suggested. However, multiple frozen sections may not be able to eliminate the deferred or discordant cases as seen in some of our deferred or discordant cases in which up to 4 frozen sections were taken. In addition, performing many frozen sections in each case is time-consuming and is usually not practical in the intraoperative settings.

The deferred diagnostic category reflects an uncertainty in the diagnosis based on limited tissue sampling. An adequate sampling is usually required for a definitive diagnosis of such examples as the diagnostic areas may be focal in nature. In our study, mucinous tumor and teratoma accounted for the majority of cases with deferred frozen section diagnosis. Five of 11 deferred cases also had maximal tumor dimension greater than 20 cm. The final diagnoses other than benign lesions in these cases were borderline tumors with low-grade epithelial proliferation or low-grade immature teratoma, both of which could be managed by conservative surgery without serious necessity for repeated exploratory laparotomy for surgical staging. In a meta-analysis by Geomini et al. (2005) it was recommended that the decision to perform a radical surgery should be suspended until a malignant diagnosis is reported by the final histologic examination.

Frozen section diagnosis represents a method of intraoperative pathology consultation which is based on the evaluation of the clinical information, the pathologic examination in a limited time, and the communication between clinicians and pathologists. It is important that both clinician and pathologist involved in this process should have a good communication of clinical findings and pathologic features and that both should understand the limitation of frozen section diagnosis. In conclusion, the frozen section is an accurate and useful test in the intra-operative evaluation of patients with ovarian masses.

References

