Is it possible to diagnose of malignancy from fluid in Cystic Ovarian Tumors?

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INTRODUCTION

Improvements in diagnostic accuracy are needed for treatment of ovarian tumor. The treatment of ovarian cystic tumors remains some problems. Should they be removed because of the carcinoma risk or should they be left in order to preserve fertility? The establishment of a detection system for gene mutations in cystic fluid might help to determine malignancy without requiring the resection of the tumor tissues.

We investigated *p53* gene expression and its mutation in the cystic fluid from patients with benign and malignant tumors to determine whether it reflects the molecular status of the cyst wall tissue.

SUBJECTS AND METHODS

Forty-eight patients with ovarian cystic tumors participated in this study. All patients had a laparotomy or laparoscopic surgery at the Department of Obstetrics and Gynecology, Kochi Medical School, from April 2004 to December 2011. The 48 patients included 31 with benign cysts, 10 with malignant tumors and 7 with borderline malignancy. This study was approved by the Institutional Review Board of Kochi Medical School Hospital.

Ovarian tumor tissue, the corresponding ovarian cystic fluid, and peripheral blood (PB) samples were obtained at surgery. The PB and ovarian cystic fluid samples were frozen and stored at -80 until DNA extraction.

After DNA extraction from the cystic fluid, polymerase chain reaction (PCR) and sequence analysis for exons 4-9 of the *p53* was performed. In two cases of mucinous cystic tumor of borderline malignancy and endometioid adenocarcinoma, the *p53* gene sequencies were determined. Furthermore, immunohistochemical staning for abnormal *p53* gene product was performed.

RESULTS

DNA was successfully extracted from all cystic fluid specimens of at least 1 ml regardless of the histlogical types of the tumor. After 35 cycles of PCR on extracted DNA using each set of primers, exons 4-9 of p53 gene were identified by electrophoresis for all types of ovarian cyst.

In one case with a mucinous cystic tumor of borderline malignancy, a point mutation in exon 6 at codon 223 (CCT→CTT) was detected by the direct sequencing of the amplified Exon. Notably, the mutation was not present in the PB sample from the patient.

In another case with a endometrial adenocarcinoma, a point mutation in exon 7 at codon 245 (GGC→AGC) was detected by the direct sequencing of the amplified

Exon. Notably, the mutation was not present in the PB sample and tissue specimens from the patient.

In our study, there is no *p53* mutation in both cystic fluid and tissue from benign ovarian cyst. *p53* mutation were identified in 12.5% (1/8) both of cystic fluid and tissue from borderline malignancy. They were identified in 10% (1/10) of cystic fluid with malignancy, but there is no mutation of *p53* in tissue from malignancy.

CONCLUSION

Concerning with cystic ovarian tumors, cystic fluid may provide informative material for molecular studies since it reflects the *p53* status of tumor tissue on the cyst wall. We conclude that further gene studies may contribute to establish a new detection system for the presence of malignancies of cystic ovarian tumors. This system might help to identify ovarian malignant without resection of the tumor tissues.