Editorial Comment on: MicroRNA-593-3p Expression in Peritoneal Lavage Fluid as a Prognostic Marker for Pancreatic Cancer Patients Undergoing Staging Laparoscopy

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Pancreatic cancer is a highly aggressive malignancy with a high mortality rate.¹ Despite improvements in the surgical management of pancreatic cancer, the prognosis of patients with unresectable diseases such as peritoneal dissemination remains poor.² Therefore, reliable biomarkers for detecting invisible peritoneal dissemination can improve decision-making regarding treatment. Suitable therapeutic strategies are based on pancreatic cancer staging by preoperative imaging modalities and staging laparoscopy.

MicroRNAs (miRs) are small, noncoding RNAs of approximately 22 nucleotides, which partially bind to the 3-untranslated region (3-UTR) of target mRNAs, leading to mRNA degradation and/or translational repression.^{3,4} MiRs have attracted attention, not only as gene expression-regulatory factors, but also as biomarkers in several body fluids, depending on disease-specific miRNA expression profiles.⁵ Rosenfeld et al. reported the interesting characteristics of miRNA expression profiles, which were useful for identifying the tissue origin of cancers of unknown primary origin.⁶ These findings strongly suggested the potential of miRs in body fluids as effective disease-specific biomarkers.

Researchers have investigated the expression of miRs in peritoneal fluids as biomarker candidates in patients with gastric, endometrial, and pancreatic cancer.^{7–11} In this issue of *Annals of Surgical Oncology*, Hata et al. report the ability of miR-593-3p expression in peritoneal lavage to predict poor prognosis in pancreatic cancer patients.¹² First, the authors discovered upregulated miR-593-3p in peritoneal lavage fluid of pancreatic cancer patients who tested positive on cytology via miRNA array analysis. Moreover, they validated the high expression levels of miR-593-3p in peritoneal lavage and clarified its role as an independent prognostic factor in patients after pancreatectomy. Droplet digital PCR methods with high sensitivity and quantitativity were used instead of existing real-time PCR methods. Based on these findings, the miR biomarker is useful for diagnosing occult peritoneal dissemination in pancreatic cancer patients.

Hata's research was a retrospective observational study, and the following issues should be considered in the future: First, was the miR-593-3p in the peritoneal cavity secreted by cancer cells, host cells, or both? Second, was the miR-593-3p in the peritoneal lavage a progressive and prognostic biomarker, or did it have a significant functional role in pancreatic cancer progression? Third, can the miR-593-3p in the peritoneal cavity be a new therapeutic target for pancreatic cancer patients? Therefore, miR-593-3p evaluation in peritoneal lavage may enable clinicians to accurately identify patients with residual invisible lesions and recurrence after surgery as well as determine more appropriate adjuvant chemotherapy indications. Further prospective studies with large cohorts and functional

analysis of miR-593-3p will be conducted to validate the significance of miR-593-3p as a biomarker and target candidate in pancreatic cancer patients.

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