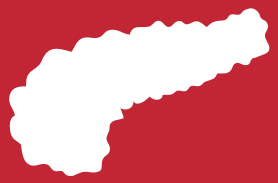
CTCatch™ Clinical Applications in Pancreatic Cancer

1 **Diagnosis**

2 **Monitoring**
- CSV

3 **Surgical Guidance**

Consult your physicians about CTCatch™ test.



CTCatch™ Test Process

1. Consult your physicians about CTCatch™ test
2. Collect 7.5mL whole blood
3. Analyze samples in Abnova Diagnostics Japan lab
4. Generate your report in 7 days
5. View test results under physician guidance

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CTC Liquid Biopsy for Pancreatic Cancer

Abnova Diagnostics Japan
CTCatch™ Test

Pancreatic Cancer

Pancreatic cancer is the twelfth most common cancer in the world (joint position with kidney cancer), with 338,000 new cases diagnosed in 2012. The early stages of this cancer do not usually produce symptoms, so the disease is generally advanced when it is diagnosed. The estimated 5-year prevalence of people in the world living with pancreatic cancer is 4.1 per 100,000. This cancer is almost always fatal, and is the seventh most common cause of death from cancer[1].

1 Diagnosis

Pancreatic tumor is clinically challenging to diagnose, because it might be adenocarcinoma, neuroendocrine tumor, precancerous condition or benign tumor. Traditional tissue biopsy takes a limited part of tumor which cannot represent the whole tumor or identify any changes over time. Tissue biopsy of pancreatic lesion presents high false negative rate and clinical risk due to residual cancer cells. Also, in many cases repeat sampling or abdominal surgery is needed for more precise diagnosis. Although sampling is not required before pancreatic resection of suspicious lesion, one must distinguish neuroendocrine tumor and adenocarcinoma before neoadjuvant chemotherapy.

In contrast, CTCatch™ test can be helpful in diagnosis of metastatic pancreatic cancer, especially when primary tumor is small and difficult to detect, or tissue biopsy is limited to metastatic sites and primary lesion. Detection of circulating tumor cells (CTCs) in pancreatic cancer determines cancer cells shed from primary pancreatic tumor and other metastatic sites, but also allows dynamic sampling at multiple time periods during clinical course to early identify symptoms and determine treatments[2].

Tissue Biopsy

- Residual cancer cells
- Not repeatable
- Not real-time
- High false negative rate

CTCatch™ Test

- Non-invasive, blood sampling
- Repeatable
- Real-time and long-term monitoring
- Useful adjunct to tissue biopsy

2 Monitoring

When cancer cells shed from primary tumor into bloodstream, leading to metastasis, the cells undergo epithelial-mesenchymal transition (EMT). During this dynamic transition, cells might reduce their adhesion, reorganize cytoskeleton, increase intermediate filament expression such as vimentin, and upregulate stem-like properties as well. It also approved that EMT is significantly associated with metastasis, recurrence and drug resistance. Cell surface vimentin (CSV) is an important biomarker on circulating tumor cells (CTCs) with EMT. Detection of CSV positive CTCs can effectively monitor cancer status[3].

3 Surgical Guidance

In recent clinical diagnosis, computed tomography (CT) or magnetic resonance imaging (MRI) are used to estimate malignant tumor development. Although CT and MRI provide anatomic delineation of the lesion, they are insufficient to accurately diagnose the presence or absence of metastasis. Positron emission tomography (PET) is also unable to detect micrometastasis due to limited resolution of 4 to 10mm. CTCs released from periampullary or pancreatic tumors are more easily detected in portal than in peripheral venous blood. Research has showed that patients with high CTC count in portal venous blood at time of surgery would have metastasis within 6 months after the surgery. Hence, detection of CTCs in portal venous blood can be an early indication of liver metastasis in patients with pancreatic cancer[4].

Reference

1. World Cancer Research Fund International
2. Cen, Putao, et al. "Circulating tumor cells in the diagnosis and management of pancreatic cancer." Biochimica et Biophysica Acta (BBA)-Reviews on Cancer 1826.2 (2012): 350-356.
3. Heiler, Sarah, Zhe Wang, and Margot Zöller. "Pancreatic cancer stem cell markers and exosomes-the incentive push." World journal of gastroenterology 22.26 (2016): 5971.
4. Tien, Yu Wen, et al. "A high circulating tumor cell count in portal vein predicts liver metastasis from periampullary or pancreatic cancer: a high portal venous CTC count predicts liver metastases." Medicine 95.16 (2016).