Case 387

1. Pancreas ductal cancer

【Progress】

He got medical chemotherapy service using GA regime for twenty times. Seventeen months after, the mild shrinkage of pancreas cancer was acquired. However, he took GA20-2, he took endoscopically gastro-jejunal anastomosis because of tumor invasion directly to stomach.

【Discussion】

Cancer cells might always emerge in humans, but they are difficult to survive long because they are recognized as foreign bodies and excluded by immune cells. Each body cell owns common-self MHC1 molecules like ribbons or faces in humans that can be distinct from others. When cancer cells emerge with different MHC1 from common-self MHC1 molecules, they instantly get attack from immune cells. To avoid attacks from immune cells, they need to have strategies to contest. They have two main strategies. One strategy in that they hide MHC1 molecules on cancer cell surface like red blood cells, trophoblastic cells, and nerve cells. Then, they are not attacked by immune cells. Another is that cancer cells take advantage of an immune-function-repression mechanism, called check point mechanism.

Check point mechanism is the mechanism of repressing immune activity or weakening immune activity. When foreign bodies like pathogens come into the human body, macrophages respond by phagocyting them and give some information to dendritic cells named antigen presenting cells (APC). APC give information helper T cells and effector cytotoxic cells (CD8, killer T cells) associated with go-sign of simulating CD 28 receptor that excite CD8 cells, inducing attacks to foreign body cells (cancer cells). As time advances, CTLA-4 and PD-1 that lessen or weaken killing function of CD8 cells, calling check points automatically appear on the surface of CD 8 cells. The appearance of these receptors is developed to avoid attacking self-body, namely, to avoid becoming autoimmune disease. PD-L1on the surface of cancer cells attaches to PD-1, activating check point mechanism action, inducing escape of cancer cells from attacks of CD 8 cells.

As treatment strategies, check point inhibitors are created such as PD-1 inhibitors (nivolumab), PD-L1 inhibitors (atezolizumab, avelumab, durvalumab), and CTLA-4 inhibitors (lpilimumab) (1). The word tail of -mab indicates antibody to receptor or ligand, while that of -nab indicates antibody to tyrosine kinase that is essential of protein synthesis from amino-acids through phosphorylation gained by ATP emerged by TCA cycle.

However, pancreas cancer has no MHC1 on cell surface, hiding not-self to host immune cells, indicative of checkpoint inhibitors being not effective. Then, DNA synthesis inhibitors are used for pancreas cancer. Cytosine is one of the four nucleic acids of DNA: adenine, guanine, thymine, cytosine, and one of the four nucleic acids of RNA: adenine, guanine, uracil, cytosine. Analogue of cytosine, called Gemcitabine inhibits synthesis of DNA and RNA (2). For cell replication, tubules that support replicated DNA are first formed, and then, tubules disappear for cell division. Nab paclitaxel (Abraxane) functions stabilization of tubules, indicative of block of cell division, leading cancer apoptosis (3). The combination use of Gemcitabine and Nab paclitaxel is used for pancreas cancer (4, 5).

In our case, he was administered twenty times of the combination of Gemcitabine and Abraxane, inducing him to become a more-than-one-year survivor with advanced pancreas cancer.

【Summary】

We presented a seventy-three-year-old male with advanced pancreas cancer who was treated with Gemcitabine and Abraxane, leading more than one-year survivor. It is borne in mind that pancreas cancer cells hide MHC1 molecules that indicate no effects of checkpoint inhibitors. DNA synthesis inhibitors are used for pancreas cancer: Gemcitabine is an analogue of cytosine that is one of the nucleotides of both DNA and RNA: Abraxane, Nab paclitaxel is a stabilizer of tubules, blocking cell division. The combination of Gemcitabine and Abraxane is expected to lengthen life survival of patients with advanced pancreas cancer than ever.

【References】

1. Wall, ME; Wani, MC. “Camptothecin and taxol: Discovery to clinic- thirteenth Bruce F. Cain Memorial Award Lecture”. Cancer Research 1995;55 : 753–60.
2. Conroy T, et al. FOLFIRINOX versus gemcitabine for metastatic pancreatic cancer. N Eng J Med. 2011;364:1817-18025
3. Von Hoff DD, et al. Increased survival in pancreatic cancer with nab-paclitaxel plus gemcitabine. N Eng J Med. 2013;369:1691-1703
4. 川合学膵癌に対する外科治療の変遷　和歌山医学　75：88－93　2024
6. 日本膵臓学会編　膵癌診療ガイドライン　金原出版　2022

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