Recommended preferable choice of chemotherapy for unresectable pancreas cancer in Japan

Case 362

3. Gemcitabine + S1　or　5. Gemcitabine + Nab paclitaxel

【Progress】

Our patient with unresectable pancreas cancer received chemotherapy of gemcitabine and nab paclitaxel (Figs.1, 2). Five months later, the chemotherapy brought about partial regression of pancreas cancer associated liver metastases (Fig.3). However, it resulted in progression tumor seven and nine months later (Figs. 4, 5).

【Discussion】

Pancreatic cancer is still challenging and not yet to be controlled. According to report Ministry of Health, Labour, and Welfare of Japan, the rank of total cancer-dead number on both of male and female is lung cancer, colon cancer, gastric cancer, pancreas cancer and hepatocellular carcinoma (1). The rank on male is the same as that on both of male and female, while the rank on female is colon cancer, lung cancer, pancreas cancer, breast cancer and gastric cancer (1).

As managements for pancreas cancer, surgical resection, chemotherapy and radiation therapy are listed. Steady progress of surgical resection revealed because cancer cell remnants are present even after surgical radical treatment with high incidence, surgical resection is possibly unable to contribute to lengthen survival (2). It resulted in that expansive lymph adenectomy did not contribute to elevate the survival rate. Further, celiac plexus lymphadenectomy induced intractable diarrhea. Then, guideline for pancreas cancer recommended to avoid prophylactic lymph adenectomy and/or celiac plexus adenectomy (3).

Guideline for pancreas cancer graded pancreas cancer into resectable, borderline resectable and unresectable; Resectable pancreas cancer, no touch or touch of less than 180 degree with SMV(superior mesenteric vein)/PV(portal vein) and no touch with SMA(superior mesenteric artery), CA(celiac artery) and CHA(common hepatic artery); borderline resectable pancreas cancer, with invasion only to superior mesenteric vein extending to within lower borderline of duodenum or with invasion only to common hepatic artery, touching less than 180 degree with SMA and/or CA (3). Unresectable pancreas cancer indicates beyond borderline resectable pancreas cancer.

Gemcitabine is a substance like cytosine. Uptake of gemcitabine taking place of cytosine in creating DNA induces repress proliferation of tumor by causing apoptosis of tumor. DNA composes of phosphate, deoxyribose, and nucleotides of adenine, guanine, thymine and cytosine. RNA composes of phosphate, deoxyribose and nucleotides of adenine, guanine, uracil and cytosine. Gemcitabine is incorporated in taking place of cytosine in creating DNA and RNA, leading apoptosis of tumor in proliferation.

Nab-paclitaxel is an inhibitor of depolymerization that necessitate for cell division (4-6). When cell division occurs, it needs tubules, high polymer which composes of many tubulins of macromolecules. Tubules are formed before cell division with polymerization of tubulin and disappear after cell division by breaking down (depolymerization) of tubules into tubulin. Tubules work as strut to support DNA immediately before cell division and cell division completes by breaking down tubules. Nab-paclitaxel inhibits the breaking-down of tubules, inducing to unable to complete cell division, leading apoptosis of tumor.

Combination of Gemcitabine and nab-paclitaxel is recommended to be given for patients with unresectable pancreas cancer (5, 6).

【Summary】

We presented a case with unresectable pancreas cancer associated with metastatic liver cancer who was treated with chemotherapy of gemcitabine and nab paclitaxel, inducing transient partial response. It is borne in mind that pancreas cancer at diagnosis is categorized into resectable, borderline resectable and unresectable; resectable, no invasion to portal vein and celiac artery; borderline resectable; invasion to portal vein not beyond lower margin of duodenum or invasion to common hepatic artery alone: unresectable, portal and/or artery invasion beyond borderline resectable. Combination of Gemcitabine and nab-paclitaxel is one of the chemotherapy regime: Gemcitabine, analogue of cytosine induces tumor apoptosis by incorporating gemcitabine, taking place of cytosine in creating DNA synthesis, while nab-paclitaxel is an inhibitor to depolymerization of tubules into tubulin that necessitates completeness of cell division, inducing blockade of cell division and leading tumor apoptosis.

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