Editorial

Comments on *National guidelines for diagnosis and treatment of pancreatic cancer 2022 in China (English version)*

Kemin Jin, Baocai Xing

Key Laboratory of Carcinogenesis and Translational Research (Ministry of Education/Beijing), Department of Hepatobiliary and Pancreatic Surgery Unit I, Peking University Cancer Hospital & Institute, Beijing 100142, China

Correspondence to: Baocai Xing. Key Laboratory of Carcinogenesis and Translational Research (Ministry of Education/Beijing), Department of Hepatobiliary and Pancreatic Surgery Unit I, Peking University Cancer Hospital & Institute, Beijing 100142, China. Email: xingbaocai88@sina.com.

Submitted Dec 12, 2022. Accepted for publication Dec 23, 2022.
doi: 10.21147/j.issn.1000-9604.2022.06.13
View this article at: https://doi.org/10.21147/j.issn.1000-9604.2022.06.13

Pancreatic cancer is a serious threat to human health, and the incidence is on the rise. Due to lack of obvious symptoms in early stage, it is often diagnosed in late stage. Its biological behavior is poor, and up to now, surgery and medical treatment have not achieved optimal effect, many efforts have been made to improve the diagnosis and treatment of pancreatic cancer. In 2022, the *National Guidelines of Diagnosis and Treatment of pancreatic cancer 2022 in China (English version)* (1) was updated and released by the National Health Commission of the People's Republic of China based on the 2018 edition. Some updated points will be discussed.

Application of functional imaging positron emission tomography (PET)/magnetic resonance imaging (MRI)

PET/computed tomography (CT) or PET/MRI is not routinely recommended for patients with pancreatic cancer, and is generally recommended for resectable pancreatic cancer at a high risk of distant metastasis. However, PET/MRI, as a functional imaging, can not only judge the tumor stage by metabolism, but also evaluate the pathological response and prognosis of patients to preoperative treatment through the change of standardized uptake value (SUV). Using PET/MRI, Panda *et al.* from Mayo Clinic retrospectively analyzed the relationship between changes in metabolic parameters and post-operative pathological response in 44 cases of borderline resectable and locally advanced pancreatic cancer after preoperative chemotherapy. The results revealed that the complete metabolic response rate (CMR) in the pathological response group was significantly higher than that in the pathological non-response group (89% *vs*. 40%, P=0.04), and the decrease in the mean tumor SUV_{max} was also significantly deeper than the latter (−70% *vs.* −37%, P<0.001), and that overall survival (OS) was clearly associated with the CMR rate and mean SUV_{max} reduction (2). The systematic review from Evangelista *et al.* (3) also suggested that the decline of SUV_{max} after chemotherapy was correlated with better pathological response and longer OS. Another advantage of PET/MRI is that compared to CT, MRI provides more sequence parameters, better soft tissue resolution, and PET and MRI images can be acquired simultaneously, resulting in better diagnostic efficacy than PET/CT (4). Furtado *et al.* found that 49% of patients changed the clinical treatment strategy when PET/MRI was added to the routine examinations (CT, MRI, and/or PET/CT) (5).

In view of advantages of imaging and soft tissue resolution of PET/MRI, its application in the diagnosis and treatment of pancreatic cancer, especially for the evaluation of preoperative chemotherapy, will be widespread.

Histological classification of pancreatic tumors [World Health Organization (WHO) 2019]

WHO histological classification of pancreatic tumors was updated in 2019. Compared to the previous edition in 2010, new clinical evidences showed that the updated version could better delineate different histological origins

© Chinese Journal of Cancer Research. All rights reserved.

and biological behaviors of pancreatic tumors. Based on this, more reasonable treatment methods can be adopted to improve the patient's prognosis.

Indications for radical resection

With the advancement of surgical techniques, anesthesia and perioperative management, elderly patients with pancreatic cancer are no longer an absolute contraindication to surgery. Especially with the aging of general population, more and more patients are diagnosed at an advanced age in good physical condition. At present, the literature has reported the safe surgical resection of pancreatic cancer in patients over 80 years old and in good physical condition. Although with increased the perioperative morbidity and mortality, the average survival time reached 22.6 months (6,7). The upper age limit of pancreatectomy extended from 75 years old to 80 years old.

Medical treatment

Adjuvant therapy

mFOLFIRINOX regimen was added. In 2018 American Society of Clinical Oncology (ASCO) meeting, the postoperative adjuvant mFOLFIRINOX regimen in an international multicenter randomized phase III clinical trial PRODIGE 24/CCTG PA.6 was reported (8). From 52 centers in France and Canada, 493 resectable pancreatic cancer patients were included from April 2012 to October 2016: the control arm received standard 4-week gemcitabine regimen for 6 cycles, and the experimental arm received mFOLFIRINOX (continuous intravenous infusion of fluorouracil 2.4 g/m^2 for 46 h, and leucovorin 400 mg/m^2, irinotecan 150 mg/m^2, oxaliplatin 85 mg/m^2 d 1, repeat every 2 weeks) for 12 cycles. Median disease-free survival (mDFS) for gemcitabine arm and mFOLFIRINOX arm was 12.8 months and 21.6 months (P<0.05), respectively, with 3-year DFS rates of 21.4% and 39.7% (P<0.05), and OS of 54.4 and 35.0 months (P<0.05), respectively. This is the longest median OS (mOS) reported to date. The mDFS of mFOLFIRINOX arm was superior to that of the gemcitabine one for all the subgroup analyses except subgroups of WHO performance score (PS) 1 score, T1/2, and N0 patients. Due to the high toxicity of the mFOLFIRINOX regimen, more than half (59.9%) of the patients in the group used colony-stimulating factors, and the non-hematologic toxicity of mFOLFIRINOX was also significantly higher than that of the gemcitabine arm. Based on the patient enrollment conditions of the above study and the finally obvious positive results, the mFOLFIRINOX regime was added into the updated guidelines.

Neoadjuvant chemotherapy regimen

The mFOLFIRINOX regimen was added [for patients with Eastern Cooperative Oncology Group Performance Status (ECOG PS) score 0–1 only, irinotecan 150 mg/m^2]; the gemcitabine (GEM) monotherapy regime and GEM + S-1 regimen were removed.

As the mFOLFIRINOX regimen achieved positive results in the postoperative adjuvant therapy of resected pancreatic cancer and advanced pancreatic cancer, the safety and efficacy of this regimen for the neoadjuvant therapy of resectable or borderline resectable pancreatic cancer was explored.

The phase II randomized study ALLIANCE A021501 evaluated the efficacy of preoperative mFOLFIRINOX and hypofractionated radiotherapy *vs.* mFOLFIRINOX chemotherapy in borderline resectable pancreatic cancer. Both groups received adjuvant chemotherapy with mFOLFOX regimen for 4 cycles, and the primary endpoint was OS rate at 18 months compared with 50% in historical groups (9). The final results revealed that the preoperative mFOLFIRINOX chemotherapy group reached the preset endpoint, with the 18-month OS rate of 66.4%, resection rate of 49%, and pathological complete response (pCR) rate of 0; while the mFOLFIRINOX chemotherapy and radiotherapy group did not reach the preset endpoint, with the 18-month survival rate of 47.3%, resection rate of 35%, and pCR rate of 11%. However, the study design could not provide a direct comparison between the two groups.

The phase III randomized control study PREOPANC-2 (10) is in progress, exploring the OS benefit of complete preoperative neoadjuvant chemotherapy (8 cycles of mFOLFIRINOX) *vs.* preoperative gemcitabine-based chemoradiation (3 cycles chemotherapy) combined with 4 cycles of postoperative gemcitabine chemotherapy for resectable and borderline resectable pancreatic cancer. A prospective phase II multi-center study PRODIGE 44 in patients with borderline resectable pancreatic cancer compared the R0 resection rate of preoperative chemotherapy with mFOLFIRINOX to that of mFOLFIRINOX chemotherapy combined with chemoradiotherapy, which is currently ongoing.

© Chinese Journal of Cancer Research. All rights reserved.

In conclusion, although the neoadjuvant therapy of pancreatic cancer is still being explored, with the data being accumulated, the mFOLFOXIRI regimen will be used more frequently in the neoadjuvant therapy.

New treatment options for locally advanced and metastatic pancreatic cancer

For patients with *BRCA 1/2* germline mutation and no progression after 16 weeks of first-line treatment with a platinum-containing regimen, maintenance treatment was recommended to use the polyadenosine diphosphate ribose polymerase (PARP) inhibitor Olaparib. For patients with somatic *BRCA 1/2* mutation or other homologous recombination repair pathway abnormalities, the same management protocol could be adopted.

In the POLO study, patients with metastatic pancreatic cancer with *BRCA 1/2* germline mutation who did not experience disease progression after 16 weeks of first-line treatment with a platinum-containing regimen switched to maintenance treatment with Olaparib (PARP inhibitor) had significantly longer PFS than those with placebo maintenance (mPFS 7.4 *vs*. 3.8 months, P=0.004). However, the long-term follow-up suggested no statistical differences in OS between the two groups (mOS 19.0 months *vs*. 19.2 months, P=0.349) (11,12). Therefore, the maintenance treatment with PARP inhibitors in patients with metastatic pancreatic cancer with *BRCA 1/2* germline mutation is still controversial.

For patients who failed in first-line treatment, studies have shown that those with specific gene variants [such as *NTRK* gene fusion, *ALK* gene rearrangement, *HER-2* amplification, and high microsatellite instability (MSI-H), etc.] in advanced pancreatic cancer could receive corresponding targeted therapy or immune checkpoint inhibitor therapy. First of all, such patients are recommended to participate in the corresponding clinical trials, and the treatment with specific targeted drugs or immunotherapy can also be considered under the guidance of an experienced oncologist.

Studies have shown that the cumulative risk of pancreatic cancer by the age of 70 years in the Lynch syndrome family members was 3.7%, which was 8.6 times higher than that of the general population (13). Earlier studies suggested that in pancreatic cancer patients with MSI-H who received pembrolizumab, 25% (2/8) of them achieved complete response (CR) and 37.5% (3/8) acheived partial response (PR) (14). The KEYNOTE-158 study included 22 MSI-H pancreatic cancer patients who received pembrolizumab treatment. However, the final results showed that the objective response rate (ORR) was only 18.2% (4/22), with mPFS 2.1 months, mOS 4.0 months, and median duration of response (DoR) 13.4 months. Compared with non-pancreatic cancer patients with MSI-H, the overall ORR, mPFS and mOS were significantly worse in pancreatic cancer patients, suggesting that MSI-H patients with different tumor types who received the same immunotherapy could acquire in different results (15).

The *NTRK* fusions are relatively rare in pancreatic cancer. Currently, the Food and Drug Administration (FDA) has approved entrectinib and larotrectinib for *NTRK* fusion patients in all tumor types, with ORR of 57%–79%, and mDoR of 10.4–35.2 months. It was reported that entrectinib was used in 3 pancreatic cancer patients with *NTRK* fusion, finally 2 patients achieved PR (16). While larotrectinib achieved PR in one pancreatic cancer patient with *NTRK* fusion (17). Therefore, from the limited data, *NTRK* fusion pancreatic cancer patients could benefit from the corresponding targeted therapy.

A gene sequencing research involving 3,170 pancreatic ductal adenocarcinoma (PDAC) patients indicated that only 5 had *ALK* fusion (0.16%). Four of them received *ALK* inhibitors (crizotinib or ceritinib) treatment, finally 3 acquired stable disease (SD), radiographic remission and/or CA19-9 normalization (18). A recent study revealed that a PDAC patient with *ALK* rearrangement received alectinib and achieved SD. After progression, he was treated with the second-generation *ALK* inhibitor lorlatinib and acquired SD (19). At present, there are many basket trials including PDAC in progress, which can further confirm that the *ALK* fusion mutation in PDAC can benefit from targeted therapy.

HER-2 amplification is uncommon in PDAC patients, and some studies have shown that PDAC patients with *HER-2* high expression had a significantly worse prognosis than those with low *HER-2* expression (20). A recently published phase II MOBILITY3 basket trial included a total of 12 patients with *HER* family expansion or mutation, including 1 PDAC patient with *HER-2* amplification. These patients received afatinib, and achieved an overall ORR of 8% and mPFS of 11.4 weeks, with the PDAC patient achieving SD (21).

In PDAC patients with $KRAS^{G12C}$ mutation, a small sample study recently reported 50% PR and 100% disease control rate (DCR) using the $KRAS^{G12C}$ inhibitor Adagrasib, which deserved further expanding the sample to

© Chinese Journal of Cancer Research. All rights reserved.

verify its efficacy (22).

Radiotherapy

There are new evidences of neoadjuvant radiotherapy for borderline resectable pancreatic cancer (BRPC).

In 2018, Murphy JE published a phase 2 single arm study (23), including 48 patients with borderline resectable pancreatic cancer. After 8 cycles of FOLFIRINOX regimen neoadjuvant chemotherapy, patients were evaluated. If the tumor was separated from the surrounding blood vessels, 5 × 5 Gy short course radiotherapy was adopted; if the tumor still cannot separate from the surrounding blood vessels, long course radiotherapy was adopted. The primary endpoint was R0 resection rate. The results suggested that the preoperative chemotherapy completion rate was 79% and the R0 resection rate was 65%, while in the analysis of 32 patients who underwent surgical resection, the R0 resection rate was 97%. The mPFS was 14.7 months and the mOS was 37.7 months. For patients undergoing surgical resection, mPFS was up to 48.6 months, although mOS was not reached. This study suggested that neoadjuvant chemotherapy using FOLFIRINOX regime combined with individualized radiotherapy can achieve a high R0 resection rate and prolong mPFS and mOS, supporting a further phase 3 study.

The first phase 2/3 multi-center randomized controlled trial (RCT) study was from South Korea. The study compared the oncologic benefit of the gemcitabine-based neoadjuvant chemoradiotherapy with upfront surgery plus adjuvant chemoradiotherapy for BRPC patients (24). Finally, there were 17 cases who received surgical resection in the neoadjuvant chemoradiotherapy group, and 18 cases in the upfront surgery group. The primary endpoint was 2-year survival rate. By the intention-to-treat (ITT) population analysis, the final results suggested that the R0 resection rate in the neoadjuvant chemoradiotherapy group was significantly higher than that in the upfront surgery group (51.8% *vs*. 26.1%, P=0.004), and the 2-year survival rate and mOS in the neoadjuvant group were significantly better than those in the upfront surgery group (40.7%, 21 months *vs.* 26.1%, 12 months, P=0.028).

From the Dutch phase III multi-center randomized trial PREOPANC (25), although initial follow-up results suggested that preoperative gemcitabine-based chemoradiotherapy did not prolong mOS, compared to the upfront surgery; however, for 113 BRPC patients, preoperative gemcitabine-based chemoradiotherapy could improve the R0 resection rate (79% *vs*. 13%, P<0.001) and prolong mOS (17.6 months *vs.* 13.2 months, P=0.029). Recent published long-term follow-up results confirmed this conclusion (P=0.045) (26).

The phase II randomized study ALLIANCE A021501 evaluated the efficacy of preoperative mFOLFIRINOX and hypofractionated radiotherapy *vs.* mFOLFIRINOX chemotherapy in borderline resectable pancreatic cancer. Both groups received adjuvant chemotherapy with mFOLFOX regimen for 4 cycles, and the primary endpoint was OS rate at 18 months compared with 50% in historical groups (9). The final results revealed that the preoperative mFOLFIRINOX chemotherapy group reached the preset endpoint, with the 18-month OS rate of 66.4%, resection rate of 49%, and pCR rate of 0; while the mFOLFIRINOX chemotherapy and radiotherapy group did not reach the preset endpoint, with the 18-month survival rate of 47.3%, resection rate of 35%, and pCR rate of 11%. Although the study was not designed to provide a direct comparison between the two groups, from the numerical comparison, adding radiotherapy to the mFOLFIRINOX regimen chemotherapy will not increase the resection rate or prolong survival.

In conclusion, for BRPC, compared to upfront surgery, the preoperative gemcitabine-based chemoradiotherapy could improve the R0 resection rate and prolong mOS. However, it remains to be elucidated whether preoperative mFOLFIRINOX regimen chemotherapy could improve R0 resection rate and prolong survival, when compared to preoperative chemoradiotherapy.

Interventional treatment

Nerve block for cancer-related pain: For pancreatic cancer patients with persistent pain in the upper abdomen, if oral analgesics do not work well or they could not tolerate the side effects of opioid analgesics, celiac plexus neurolysis (CPN) might be considered for them. This treatment is performed by injection of drugs (95% ethyl alcohol and local anesthetics) into the celiac nerve plexus under the guidance of CT/MR or ultrasound/endoscopic ultrasound to relieve abdominal pain by blocking the sympathetic pathway occupying the internal organs.

Since CPN was used clinically in 1919, it has been widely used to relieve pain in patients with unresectable pancreatic cancer. A systematic review and meta-analysis from Japan suggested that CT-guided CPN provided immediate pain

© Chinese Journal of Cancer Research. All rights reserved.

relief without major complications (27). Abdelbaser *et al.* conducted a randomized, controlled, non-inferiority study comparing intraoperative CNP and percutaneous CT-guided CNP. It was found that the median visual analogue score (VAS) on d 7 and d 180 was comparable between two groups, and the dose of tramadol usage was also comparable, without a statistical difference in morbidity. However, the latter was more convenient (28). It was reported that adding endoscopic ultrasound-guided-CPN (EUS-CPN) to EUS-CGN could further improve the pain relief rate and complete relief rate, but not prolong the pain relief period, when compared to EUS-CPN only (29). A recent network meta-analysis included 662 patients with unresectable pancreatic cancer in 10 RCT studies. The results suggested that EUS-CPN plus medical management (MM) was significantly better than percutaneous (P)-CPN plus MM and MM alone in pain relief 4 weeks and 12 weeks after the procedures (30). However, recently, a propensity score analysis from the SEER database suggested that the median survival of patients receiving CPN for pain relief was significantly shorter than that of patients receiving opioid analgesics (mOS: 4 months *vs*. 7 months, P<0.0001) (31). So the rational use of CPN in PDAC for pain relief is still controversial.

Directions in the future

The prognosis of pancreatic cancer is still dismal. Currently aggressive surgical procedures have been proven unable to prolong patient survival with only increased perioperative morbidity and mortality. Therefore, the improvement of the prognosis of pancreatic cancer depends on the advancement of following directions: The first one is to improve the early diagnosis rate of PDAC. Nowadays a lot of biomarkers other than CA19-9 have been utilized in the early diagnosis of pancreatic cancer, which should be confirmed in large sample size clinical trials in the future. The second one is to increase the number of pancreatic cancer patients suitable for resection. For the conversion therapy of unresectable pancreatic cancer, a phase III RCT study of conversion therapy using immunotherapy and chemotherapy is ongoing (ENREACH-PDAC-01 trial 2022ASCO TPS 4189). Thirdly, for unresectable advanced pancreatic cancer, the precision medicine might provide new insights in the treatment of these patients. Potentially targeted gene variants could be screened out through next generation sequencing. The prognosis of patients and the treatment efficacy could be reflected by ctDNA analysis and changes. Individuals who might benefit from immunotherapy or other new therapies will be screened out by the analysis of immune microenvironment of PDAC.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. National Health Commission of the People's Republic of China. National guidelines for diagnosis and treatment of pancreatic cancer 2022 in China (English version). Chin J Cancer Res 2022;34:238-55.
2. Panda A, Garg I, Truty MJ, et al. Borderline resectable and locally advanced pancreatic cancer: FDG PET/MRI and CT tumor metrics for assessment of pathologic response to neoadjuvant therapy and prediction of survival. AJR Am J Roentgenol 2021;217:730-40.
3. Evangelista L, Zucchetta P, Moletta L, et al. The role of FDG PET/CT or PET/MRI in assessing response to neoadjuvant therapy for patients with borderline or resectable pancreatic cancer: a systematic literature review. Ann Nucl Med 2021;35:767-76.
4. Catalano OA, Coutinho AM, Sahani DV, et al. Colorectal cancer staging: comparison of whole-body PET/CT and PET/MR. Abdom Radiol (NY) 2017;42: 1141-51.
5. Furtado FS, Ferrone CR, Lee SI, et al. Impact of PET/MRI in the treatment of pancreatic adeno-carcinoma: a retrospective cohort study. Mol Imaging Biol 2021;23:456-66.
6. Oliveira-Cunha M, Malde DJ, Aldouri A, et al. Results of pancreatic surgery in the elderly: is age a barrier. HPB (Oxford) 2013;15:24-30.
7. Belyaev O, Herzog T, Kaya G, et al. Pancreatic surgery in the very old: face to face with a challenge of the near future. World J Surg 2013;37:1013-20.
8. Conroy T, Hammel P, Hebbar M, et al. FOLFIRINOX or gemcitabine as adjuvant therapy for pancreatic cancer. N Engl J Med 2018;379:

© Chinese Journal of Cancer Research. All rights reserved.

2395-406.
9. Katz MHG, Ou FS, Herman JM, et al. Alliance for clinical trials in oncology (ALLIANCE) trial A021501: preoperative extended chemotherapy vs. chemotherapy plus hypofractionated radiation therapy for borderline resectable adenocarcinoma of the head of the pancreas. BMC Cancer 2017;17:505.
10. Janssen QP, van Dam JL, Bonsing BA, et al. Total neoadjuvant FOLFIRINOX versus neoadjuvant gemcitabine-based chemoradiotherapy and adjuvant gemcitabine for resectable and borderline resectable pancreatic cancer (PREOPANC-2 trial): study protocol for a nationwide multicenter randomized controlled trial. BMC Cancer 2021;21:300.
11. Golan T, Hammel P, Reni M, et al. Maintenance olaparib for germline BRCA-mutated metastatic pancreatic cancer. N Engl J Med 2019;381:317-27.
12. Kindler HL, Hammel P, Reni M, et al. Overall survival results from the POLO trial: A phase III study of active maintenance olaparib versus placebo for germline BRCA-mutated metastatic pancreatic cancer. J Clin Oncol 2022;40:3929-39.
13. Kastrinos F, Mukherjee B, Tayob N, et al. Risk of pancreatic cancer in families with Lynch syndrome. JAMA 2009;302:1790-5.
14. Le DT, Durham JN, Smith KN, et al. Mismatch repair deficiency predicts response of solid tumors to PD-1 blockade. Science 2017;357:409-13.
15. Marabelle A, Le DT, Ascierto PA, et al. Efficacy of pembrolizumab in patients with noncolorectal high microsatellite instability/mismatch repair-deficient cancer: results from the phase II KEYNOTE-158 study. J Clin Oncol 2020;38:1-10.
16. Doebele RC, Drilon A, Paz-Ares L, et al. Entrectinib in patients with advanced or metastatic NTRK fusion-positive solid tumours: integrated analysis of three phase 1-2 trials. Lancet Oncol 2020;21:271-82.
17. Drilon A, Laetsch TW, Kummar S, et al. Efficacy of larotrectinib in TRK fusion-positive cancers in adults and children. N Engl J Med 2018;378:731-9.
18. Singhi AD, Ali SM, Lacy J, et al. Identification of targetable ALK rearrangements in pancreatic ductal adenocarcinoma. J Natl Compr Canc Netw 2017;15:555-62.
19. Gower A, Golestany B, Gong J, et al. Novel ALK fusion, PPFIBP1-ALK, in pancreatic ductal adenocarcinoma responsive to alectinib and lorlatinib. JCO Precis Oncol 2020;4:PO.19.00365.
20. Ortega MA, Pekarek L, Fraile-Martinez O, et al. Implication of ERBB2 as a predictive tool for survival in patients with pancreatic cancer in histological studies. Curr Oncol 2022;29:2442-53.
21. Salawu A, Hansen AR, Spreafico A, et al. A phase 2 trial of afatinib in patients with solid tumors that harbor genomic aberrations in the HER family: The MOBILITY3 basket study. Target Oncol 2022;17:271-81.
22. Ou SI, Jänne PA, Leal TA, et al. First-in-human phase I/IB dose-finding study of adagrasib (MRTX849) in patients with advanced KRAS(G12C) solid tumors (KRYSTAL-1). J Clin Oncol 2022;40:2530-8.
23. Murphy JE, Wo JY, Ryan DP, et al. Total neoadjuvant therapy with FOLFIRINOX followed by individualized chemoradiotherapy for borderline resectable pancreatic adenocarcinoma: A phase 2 clinical trial. JAMA Oncol 2018;4:963-9.
24. Jang JY, Han Y, Lee H, et al. Oncological benefits of neoadjuvant chemoradiation with gemcitabine versus upfront surgery in patients with borderline resectable pancreatic cancer: A prospective, randomized, open-label, multicenter phase 2/3 trial. Ann Surg 2018;268:215-22.
25. Versteijne E, Suker M, Groothuis K, et al. Preoperative chemoradiotherapy versus immediate surgery for resectable and borderline resectable pancreatic cancer: Results of the dutch randomized phase III PREOPANC trial. J Clin Oncol 2020;38:1763-73.
26. Versteijne E, van Dam JL, Suker M, et al. Neoadjuvant chemoradiotherapy versus upfront surgery for resectable and borderline resectable pancreatic cancer: Long-term results of the dutch randomized PREOPANC trial. J Clin Oncol 2022;40:1220-30.
27. Matsumoto T, Yoshimatsu R, Osaki M, et al. Computed tomography-guided single celiac plexus neurolysis analgesic efficacy and safety: a systematic review and meta-analysis. Abdom Radiol (NY) 2022;47:3892-906.
28. Abdelbaser I, Shams T, El-Giedy AA, et al. Direct intraoperative versus percutaneous computed

© Chinese Journal of Cancer Research. All rights reserved.

tomographyguided celiac plexus neurolysis in non-resectable pancreatic cancer: A randomized, controlled, non-inferiority study. Rev Esp Anestesiol Reanim (Engl Ed) 2022;69:71-8.
29. Kamata K, Kinoshita M, Kinoshita I, et al. Efficacy of EUS-guided celiac plexus neurolysis in combination with EUS-guided celiac ganglia neurolysis for pancreatic cancer-associated pain: a multicenter prospective trial. Int J Clin Oncol 2022;27:1196-201.
30. Okita M, Otani K, Matsui S. Efficacy of endoscopic ultrasound-guided celiac plexus neurolysis for abdominal pain in patients with unresectable pancreatic cancer: network meta-analysis of randomized controlled trials. J Clin Gastroenterol 2022. [Online ahead of print]
31. Zylberberg HM, Nagula S, Rustgi SD, et al. Celiac plexus neurolysis is associated with decreased survival in patients with pancreatic cancer: A propensity score analysis. Pancreas 2022;51:153-8.

Cite this article as: Jin K, Xing B. Comments on *National guidelines for diagnosis and treatment of pancreatic cancer 2022 in China (English version)*. Chin J Cancer Res 2022;34(6):637-643. doi: 10.21147/j.issn.1000-9604.2022.06.13

© Chinese Journal of Cancer Research. All rights reserved.