

Self-Assessment Module
2017 ASTRO Annual Meeting

GI eContouring

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Question 1:

A patient is found to have biopsy-proven pancreatic cancer with 270° involvement of the superior mesenteric artery and no distant or nodal metastases. Which of the following are appropriate induction chemotherapy regimens for this patient?

- a. mFOLFIRINOX
- b. Cisplatin-5FU
- c. Gemcitabine-Abraxane
- d. A and C

Answer:

D

Feedback:

This patient has locally advanced, unresectable pancreatic cancer, as defined by having greater than 180° involvement of the SMA and no distant disease. Either FOLFIRINOX or gemcitabine/abraxane are appropriate induction therapies. Modified FOLFIRINOX (mFOLFIRINOX) is typically given to patients who are younger and/or have a higher performance status due to its higher toxicity profile. On the other hand, Gemcitabine/abraxane is typically given to older patients or those with lower performance status.

Location:

TBD

References:

- 1) Yamada S, Fujii T, Sugimoto H, et al: Aggressive surgery for borderline resectable pancreatic cancer: Evaluation of National Comprehensive Cancer Network guidelines. *Pancreas* 42:1004-1010, 2013
- 2) Al-Hawary MM, Pancreatic Ductal Adenocarcinoma Radiology Reporting Template: Consensus Statement of the Society of Abdominal Radiology and the American Pancreatic Association. *Radiology*: 270(1) 2014
- 3) Khorana AA, Potentially Curable Pancreatic Cancer: American Society of Clinical Oncology Clinical Practice Guideline, *JCO* 2016
- 4) Ryan DP, Pancreatic Adenocarcinoma. *N Engl J Med* 2014;371:1039-49.

--- End of Question 1 ---

Question 2:

A patient with locally advanced adenocarcinoma of the pancreatic head completes their induction chemotherapy without a change in resectability. The patient is interested in pursuing SBRT for consolidation. Which of the following could help to reduce treatment-related toxicity?

- a. Accurate tumor delineation with simulation CT with contrast
- b. Maintaining a proximal duodenal constraint of V33<1cc, V20<3cc
- c. Consuming a bolus of 240cc of water 30 min prior to simulation and treatment
- d. All of the above

Answer:

D

Feedback:

Accurate GTV delineation with 4D CT and contrast is critical to SBRT. Since the treatment is conformal and margins so small, accuracy of the target and subsequent motion management are critical to success. Image guidance through 4D CT and gating with treatment gating or ABC/breath hold technique can all account for tumor motion and allow for a reduction in the ITV. The duodenal and stomach constraints are critical. The Stanford technique often calls for V33<1cc and V20<3cc. However, the recent Alliance protocol for borderline resectable disease relaxes these constraints slightly to V35<1cc and V20<20cc. Consuming a bolus of about 240cc (8oz) of water prior to treatment helps to distend the duodenum and stomach before treatment to reduce the chances of luminal collapse and transmural treatment of the duodenum.

Location:

TBD

References:

1. Herman, J. M. *et al.* Phase 2 multi-institutional trial evaluating gemcitabine and stereotactic body radiotherapy for patients with locally advanced unresectable pancreatic adenocarcinoma. *Cancer* **121**, 1128-1137, doi:10.1002/cncr.29161 (2015).
2. Moningi, S. *et al.* Stereotactic body radiation therapy in pancreatic cancer: the new frontier. *Expert Rev Anticancer Ther* **14**, 1461-1475, doi:10.1586/14737140.2014.952286 (2014).
3. Murphy, J. D. *et al.* A dosimetric model of duodenal toxicity after stereotactic body radiotherapy for pancreatic cancer. *Int J Radiat Oncol Biol Phys* **78**, 1420-1426, doi:10.1016/j.ijrobp.2009.09.075 (2010).
4. Katz, M. H. G. *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* **17**, 505, doi:10.1186/s12885-017-3441-z (2017).

--- End of Question 2 ---

Question 3:

A 65 year old male with locally advanced pancreatic cancer has a 50% response to 6 months of FOLFIRINOX induction chemotherapy. However, the tumor continues to encase a portion of the SMA, along with a small area of invasion into the duodenum and a stable, but suspicious para-aortic lymph node. He continues his job as a lawyer but has worsening paresthesias and rising LFTs from chemotherapy. What is the best course of therapy at this juncture?

- a. 6 more months of FOLFIRINOX
- b. Chemoradiation over 5.5 weeks with concurrent capecitabine
- c. SBRT
- d. Surgery

Answer:

B

Feedback:

This patient has had an excellent radiologic response to chemotherapy, but appears to be exhibiting some toxicity now with some hepatotoxicity and paresthesias, and could use a chemo holiday. A switch to gem-abraxane might be reasonable, but 6 more months of FOLFIRINOX is probably not. The tumor remains unresectable with SMA encasement. SBRT is excluded due to node+ disease and invasion into the duodenum. It would be reasonable to consider consolidative radiotherapy over 5.5 weeks with concurrent capecitabine (or infusional 5-FU). The vast majority of patients still succumb to metastatic disease following surgery. Therefore, it might be reasonable to switch chemotherapy regimens after radiation. Given that the patient has tolerated aggressive chemotherapy well and has had a response, further chemotherapy after local consolidation might maximize their response.

Location:

TBD

References:

1. Expert Panel on Radiation, O.-G. *et al.* ACR Appropriateness Criteria(R) Borderline and Unresectable Pancreas Cancer. *Oncology (Williston Park)* **30**, 619-624, 627, 632 (2016).
2. Trakul, N., Koong, A. C. & Chang, D. T. Stereotactic body radiotherapy in the treatment of pancreatic cancer. *Semin Radiat Oncol* **24**, 140-147, doi:10.1016/j.semradonc.2013.11.008 (2014).
3. Ben-Josef, E. *et al.* Intensity-modulated radiotherapy (IMRT) and concurrent capecitabine for pancreatic cancer. *Int J Radiat Oncol Biol Phys* **59**, 454-459, doi:10.1016/j.ijrobp.2003.11.019 (2004).

--- End of Question 3 ---

Question 4:

Which of the following statements are true regarding pancreatic cancer staging?

- a. Multi-detector dual phase pancreatic protocol CT + CT chest and pelvis is most preferred
- b. Endoscopic ultrasound (EUS) is most important for staging
- c. Diagnostic laparoscopy alone is sufficient for staging.
- d. A and B

Answer:

A

Feedback:

MDCT dual phase pancreatic protocol CT is the gold standard for staging pancreatic cancer. EUS and MRI are much more operator-dependent. However, MRI is acceptable for staging if there is a contraindication to CT (i.e., contrast allergy). Staging is done completely by imaging. A staging or diagnostic laparoscopy can be done to examine for radio occult metastases, but is not sufficient for staging.

Location:

TBD

References:

- 1) Balaban EP, Locally Advanced, Unresectable Pancreatic Cancer: American Society of Clinical Oncology Clinical Practice Guideline, JCO 2016
- 2) Khorana AA, Potentially Curable Pancreatic Cancer: American Society of Clinical Oncology Clinical Practice Guideline, JCO 2016

--- End of Question 4 ---

Question 5:

A modified Appleby procedure involving distal pancreatectomy with *en bloc* splenectomy and resection of the celiac axis can be safely performed if a patient has what structures patent to maintain collateral arterial circulation?

- a) Splenic artery and pancreaticoduodenal arcade
- b) Gastroduodenal artery and pancreaticoduodenal arcade
- c) Gastric artery and gastroduodenal artery
- d) Splenic artery and gastroduodenal artery

Answer:

B

Feedback:

By definition, celiac encasement signifies LAPC. However, following maximal chemotherapy and radiation therapy, it is becoming more evident that well-selected patients with celiac involvement could undergo a curative surgical resection. It is important to stress that for this type of resection to occur (Appleby procedure), the tumor must not involve these arteries. In addition to identifying the GDA on CT, most surgeons will also establish flow through the GDA and the arcade by intraoperative Doppler assessment or clamping of the common hepatic artery (CHA).

Location:

TBD

Reference:

- 1) Wolfgang CL, Herman JM, Laheru DA, Klein AP, Erdek MA, Fishman EK, Hruban RH. Recent progress in pancreatic cancer. *CA Cancer J Clin.* 2013 Sep;63(5):318-48.
- 2) Cesaretti M, Abdel-Rehim M, Barbier L, Dokmak S, Hammel P, Sauvanet A. Modified Appleby procedure for borderline resectable/locally advanced distal pancreatic adenocarcinoma: A major procedure for selected patients. *J Visc Surg.* 2016 Jun;153(3):173-81.
- 3) Latona JA, Lamb KM, Pucci MJ, Maley WR, Yeo CJ. Modified Appleby Procedure with Arterial Reconstruction for Locally Advanced Pancreatic Adenocarcinoma: A Literature Review and Report of Three Unusual Cases. *J Gastrointest Surg.* 2016 Feb;20(2):300-6.

--- End of Question 5 ---