The Role of Radiation Therapy Following Adjuvant Chemotherapy in Pancreatic Adenocarcinoma

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OBJECTIVES: Early studies of adjuvant treatment for resected pancreatic adenocarcinoma demonstrated significant improvements in disease-related outcomes with the administration of radiation therapy. However, with the advent of gemcitabine and other newer chemotherapy regimens, the value and proper role of adjuvant radiation have come into question. In this study, we examine disease-related outcomes in patients treated with surgery and modern chemotherapy with or without subsequent radiation therapy in order to clarify the role of adjuvant radiation in this particular setting and to identify subsets of patients most likely to benefit from radiation.

METHODS: We conducted an institutional retrospective review of all patients with pancreatic adenocarcinoma treated with curative-intent surgery and adjuvant chemotherapy between December 2001 and January 2013. Actuarial estimates of local control (LC), local failure–free survival (LFFS), overall survival (OS), and median survival (MS) were determined by the Kaplan-Meier method, with examination of the benefit of adjuvant radiation completed with the log-rank test. Patients were also stratified by node and margin status in order to determine the effect of radiation within these subsets.

RESULTS: A total of 71 patients (median age: 64.6 years) with pancreatic adenocarcinoma underwent treatment with curative-intent surgery and adjuvant gemcitabine-based (n = 66) or (fluorouracil [5-FU], leucovorin, irinotecan, oxaliplatin) (FOLFIRINOX) (n = 5) chemotherapy. Surgical margins were negative in 44 patients, close in 8 patients, and positive in 19 patients. Lymph nodes were pathologically involved in 46 cases. Following completion of adjuvant chemotherapy, 21 patients went on to receive radiation therapy, with nearly all receiving 5,040 cGy delivered in 28 fractions. Sensitizing fluoropyrimidine-based chemotherapy was administered with radiation in 20 of the 21 patients. Median follow-up for the cohort was 21.9 months. Patients receiving radiation (vs those with no radiation) did not have statistically significant improvements in 18-month LC (64.1% vs 53.7%; \( P = .42 \)), LFFS (51.6% vs 51.4%; \( P = .63 \)), OS (69.6% vs 80.6%; \( P = .49 \)), or MS (28.5 mo vs 32.6 mo; \( P = .49 \)). In the subset of patients with positive nodes and negative margins, radiation was associated with a trend toward improved local control (18-mo LC: 62.2% vs 34.2%; \( P = .08 \)).

CONCLUSIONS: We discerned no significant improvements with the addition of radiation therapy in these patients with resected pancreatic adenocarcinoma treated with modern adjuvant chemotherapy, but statistical power was limited. The eventual results of the ongoing Radiation Therapy Oncology Group (RTOG) study RTOG 0848 will provide definitive data regarding the appropriate role for radiation in the era of modern adjuvant chemotherapy.

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