

Radiation before surgery improves pancreatic cancer outcomes

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Pancreatic cancer is one of the deadliest and most difficult to treat cancers. Now, in a major step forward, researchers at NewYork-Presbyterian Hospital/Weill Cornell Medical Center have shown that administering radiation therapy prior to surgery nearly doubles survival in pancreatic cancer patients with operable tumors.

"Patients who received pre-surgical (neoadjuvant) radiation had almost double the overall survival compared with similar patients who didn't undergo radiation, and survived significantly longer than patients who received radiation after the tumor was removed," says the study's senior author, Dr. David Sherr, assistant professor of clinical radiation oncology at Weill Cornell Medical College, and a radiation oncologist at NewYork-Presbyterian Hospital/Weill Cornell Medical Center.

The findings are published in the Nov. 15 issue of the *International Journal of Radiation Oncology, Biology and Physics*.

Pancreatic cancer remains the fifth deadliest malignancy in the United States, killing more than 32,000 Americans each year. It is typically not detected until it is already at an advanced stage when cure is rarely possible. In fact, the five-year survival rate for pancreatic cancer has been stalled at just 5 percent for the past 25 years.

Because pancreatic tumors have often spread or have directly invaded critical structures by the time they are detected, just 15 to 20 percent of patients are deemed suitable candidates for surgical removal (resection)



of the tumor. And while post-operative radiotherapy has long been used to sterilize residual cancer cells that may not have been removed by surgery, the notion of using radiation before resection has been a controversial one.

"There are potential benefits to delivering radiation before surgery rather than after," Dr. Sherr notes. "Radiation might actually increase the number of people eligible for tumor resection, by shrinking the tumor so it no longer endangers vital structures, such as the major blood vessels in close proximity to the pancreas."

In addition, neoadjuvant radiation might render cancer cells less likely to establish metastases -- an important consideration, since surgery can shed stray tumor cells into the bloodstream.

"Radiation could also provide more benefit if given prior to surgery, since radiation therapy is more effective in well-oxygenated tumor tissues. After surgery, tissue is frequently less well oxygenated due to the development of scar tissue," Dr. Sherr notes.

Finally, patients are typically more able to easily tolerate radiation therapy before surgery rather than after the operation, when they are often weak and require a prolonged convalescence period before they're well enough to receive additional treatment.

However, until now, the authors are aware of no major study that has suggested that neoadjuvant radiation had any distinct advantage over postoperative radiation in terms of survival for patients with resectable tumors.

In this retrospective analysis, Dr. Sherr -- along with Weill Cornell Graduate School of Medical Sciences student Alexander Stessin and NewYork-Presbyterian/Weill Cornell radiation oncology resident Dr.



Joshua Meyer -- analyzed data from 3,885 cases of resected pancreatic cancer, recorded between 1994 and 2003 as part of the national Surveillance, Epidemiology and End Results (SEER) registry database.

Of these cases, 2,337 (60 percent) of patients had received surgery alone, 1,478 (38 percent) received radiation after resection, and 70 (2 percent) received neoadjuvant radiation therapy.

The team found that the overall survival of patients who received neoadjuvant radiation was 23 months, compared with 17 months for those receiving post-surgical radiotherapy and just 12 months for patients who received surgery alone.

Controlling for variables such as patient age, sex, cancer stage, grade and year of diagnosis, they found that neoadjuvant radiation cut the death risk for patients by 45 percent compared with other treatment strategies, and by 37 percent compared with radiation performed after surgery.

Why the improvement in outcomes? "It may be that in shrinking the tumor, pre-operative radiation gives the surgeon more of a margin of healthy tissue to work with. Because of that, patients are less likely to have microscopic residual disease," Dr. Sherr speculates.

He stressed that the findings do need to be verified by a randomized, prospective trial -- the gold standard of medical research -- before any firm recommendations can be made. Dr. Sherr is hopeful that such a trial will be conducted in the future.

"In the meantime, this is really heartening news for patients," he says. "It suggests that there may be a real advantage to pre-operative radiation. Right now, when a pancreatic tumor is deemed operable, patients typically go straight to surgery. This suggests that -- in some cases at least -- we may be able to boost the odds of cure if we employ radiation



first. More study is needed, but I believe this type of research has the potential to change practice."

Source: New York- Presbyterian Hospital

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