Electrical pulse treatment gives pancreatic cancer patients new hope

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Results of a study presented at the Society of Interventional Radiology's 37th Annual Scientific Meeting in San Francisco, Calif., signal a light at the end of the tunnel for individuals with inoperable locally advanced pancreatic cancer (LAPC). A new procedure called irreversible electroporation or IRE uses microsecond electrical pulses to force open and destroy tumor cells around a vast and delicate network of blood vessels of the pancreas. The technique has been successful in treating primary and metastatic liver cancer and IRE is now in the first stages of implementation as a treatment for pancreatic cancer.

"We think in another 12 to 15 months we will have a lot more evidence to support the use of IRE for inoperable pancreatic cancer patients," said Govindarajan Narayanan, M.D., chief of vascular and interventional radiology, associate professor of clinical radiology and program director for the vascular interventional radiology fellowship at the University of Miami's Miller School of Medicine in Miami, Fla. "If we continue to get good results, this procedure could provide a huge benefit for people who honestly don't have a lot of choices. It could potentially change the rules of how these cases are managed," he added.

Pancreatic tumors are notoriously difficult to treat because any method that uses heat or cold to remove the cancer comes with too much risk of collateral damage to important blood vessels in and around the organ. IRE involves guiding electrode needles into the tumor, which gives cancer cells a series of jolts of localized high-voltage electricity that break open the cell membranes, effectively killing the cancerous tissues

around these blood vessels.

"People with locally advanced pancreatic cancer don't have a lot of treatment choices available. Irreversible electroporation gives these individuals a new treatment option and a potentially greater chance of survival," said Narayanan. "Without IRE, these people are essentially left with chemotherapy and radiation therapy. At this point the prognosis for this group is pretty dismal and they have an estimated survival of less than one year. With this procedure, there is the potential to have the tumor peeled off the blood vessels, and follow up treatment to repair the affected area of the pancreas," he noted.

According to the American Cancer Society, an estimated 43,920 people will be diagnosed with pancreatic cancer and approximately 37,390 people will die of the disease this year. About one in 71 people are expected to develop pancreatic cancer in their lifetime.

For this study, researchers gathered records for eight patients with locally advanced pancreatic cancer referred for percutaneous irreversible electroporation. All subjects had the procedure performed between December 2010 and September 2011. Pancreatic tumors were found to be between 2.5 and 6.8 centimeters in size and each participant had formerly received a median of two other methods of treatment. A median span of time of about 9 months took place between diagnosis and treatment with IRE. Participants underwent post-procedure CT imaging to gauge the effectiveness of treatment. Out of the original eight inoperable individuals, two went on to have surgery. Both had successful resections and remain cancer-free after months following treatment.

IRE is performed with a technology dubbed NanoKnife, which has received clearance from the U.S. Food and Drug Administration for the surgical ablation of soft tissue.

"As we move forward there will be a lot of new technology and techniques like this that will help shape cancer care," said Narayanan.

Provided by Society of Interventional Radiology