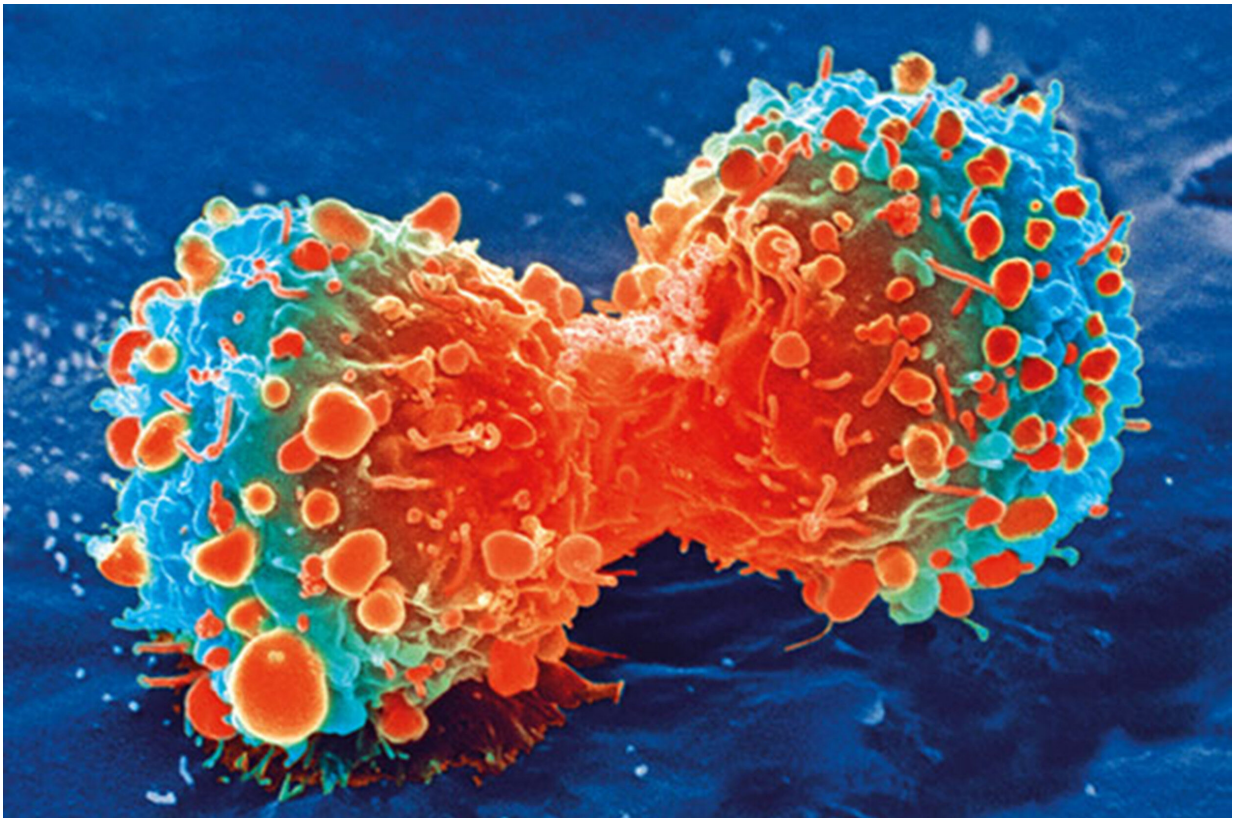
MedicalXpress

Study supports use of radiation before cell therapy for multiple myeloma

October 28 2020, by Steve Graff



Cancer cell during cell division. Credit: National Institutes of Health

Administering radiation therapy to multiple myeloma patients waiting for CAR T cells to be manufactured was found to be safe and undisruptive to CAR T therapy, according to a new study from

researchers in the Abramson Cancer Center at the University of Pennsylvania to be presented Tuesday, October 27, at the virtual American Society for Radiation Oncology Annual Meeting (Abstract #35562).

The study found patients who received radiation 34 days or fewer before their infusion with CART-BCMA (B cell maturation antigen) cells did not have worse rates of severe cytokine release syndrome (CRS) or neurotoxicity, two common side effects of the cellular therapy, and hematologic toxicities than patients who did not have so-called bridging care.

Radiation for relapsed/refractory multiple myeloma is often used to palliate bone pain associated with the disease; however, what effect it may have on patients and CAR T cell therapy hasn't been fully understood. The new findings suggest it appears to be a safe option for patients before they receive their CAR T cell infusions, lending more support for future studies that combine radiation with cellular therapy.

"The most important takeaway here is that bridging radiation doesn't appear to increase the risk of CRS or neurotoxicity," said lead author Shwetha Manjunath, MD, a resident in Radiation Oncology in Penn's Perelman School of Medicine. "These patients safely received bridge radiation without it affecting the efficacy of CAR T cells or the rates of toxicity."

Chimeric antigen receptor T cell therapy, known as CAR T, is an investigational treatment pioneered by researchers at Penn that modifies patients' own immune T cells, which are collected and reprogrammed to seek and destroy the patients' cancer cells. After being infused back into patients' bodies, these newly built "hunter" cells both multiply and attack. The Penn-developed CART-BCMA targets cells that express BCMA, which is highly expressed in myeloma.

This study, which is a retrospective analysis of a collaboration project with Novartis, evaluated the medical records of 25 patients who received CART-BCMA and categorized them into three groups. One group received radiation after their cells were collected for CAR T manufacturing but before their infusion, a period of 34 days or less. A second group of patients had received radiation within one year prior to CAR T infusion. A third group received either no radiation at all or no radiation within the year preceding CAR T infusion.

None of the four patients who received radiation while awaiting manufacturing experienced CRS, gastrointestinal, infectious, liver-related, or neurologic toxicities higher than a grade 3. CRS is a toxicity that includes varying degrees of flu-like symptoms, with high fevers, nausea, and muscle pain, and can require ICU-level care. Those patients also had lower rates of grade 4 hematologic toxicities. Of the eight patients who had a prior history of radiation, three experienced grade 3 or higher CRS. Among the 13 patients who did not receive any radiotherapy, five experienced Grade 3 or higher CRS. Radiation status was not associated with a decrease in overall survival or progression free survival.

In 2019, Penn researchers presented findings at ASTRO that found radiation did not interfere with the efficacy of CAR T cell therapy in non-Hodgkin lymphoma and had the potential to lower side effects in these patients.

"Our work is hypothesis generating, hinting at a potential synergism between radiation and CART-BCMA therapy, which has been reported by others in the literature," Manjunath said. "Future prospective trials that combine radiation with CART-BCMA may further optimize safety and long-term efficacy of this novel cell therapy."

Manjunath will present the findings as an oral abstract at 12:45 p.m.,

Tuesday, October 27.

Provided by Perelman School of Medicine at the University of Pennsylvania