First results from the tri-fraction radiation therapy used to minimise patient-hospital trips (TRIUMPH-T) trial

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What was your motivation for initiating this study?

Our motivation was to deliver accelerated partial-breast irradiation more efficiently so that cancer patients would have to undergo fewer trips to the hospital than is currently the case. Eight institutions participated, in which 200 patients were given accelerated partial-breast irradiation through the application of interstitial therapy with either multi-catheter interstitial catheters, the multi-lumen Contura, or the multi-lumen strut-adjusted volume implant (SAVI) device. It was found that radiobiologically, delivery of the radiation in three fractions of 750Gy gave an equivalent uniform dose with the same cell kill as did delivery of 50Gy in 25 fractions. Delivery of the radiation in three rather than five, 15 or 25 external beam fractions or eight to 10 brachytherapy fractions increased the value by decreasing cost without increasing toxicity. The TRIUMPH-T schedule was also significantly more convenient for patients, as those who lived far from local cancer centres or had other obligations could complete their treatment more quickly and in fewer trips than before. Shortening the treatment period also increased safety, particularly for patients at increased risk of infection, such as diabetic patients or heavy smokers.

What were the main challenges during the work?

The most significant challenge was the cost. All participants were enthusiastic supporters of the plan to receive treatment through accelerated partial-breast irradiation and brachytherapy. We are thankful to our sponsors for supporting the project, as completion of any trial in the USA carries a significant cost burden. The most significant challenge during the update period of the study was getting follow-up data from the individual centres.

What are the most important findings in your study?

The most important finding is that accelerated partial-breast irradiation with interstitial brachytherapy can be safely delivered in three fractions over two days. This is significant from a patient perspective, as the catheters or devices are in-situ for only one night, which increases convenience and safety; from an organisational perspective, the devices' value is increased. Toxicity was found to be low after a median follow-up of two years. After longer-term follow up (3.63 years), 94% of women had excellent or good cosmesis. There were no grade-4 toxicities and grade-3 fibrosis was seen in 1.7% of patients. One rib fracture was documented. Fewer than 10% of patients had grade-1 hyperpigmentation (7.4%), telangiectasias (2%), infections (1.7%) or fat necrosis (1.1%). There were two (1.1%) ipsilateral local recurrences and two (1.1%) nodal recurrences; no distant recurrences were documented.

What are the implications of this research?

The implications are that more patients with early breast cancer can be treated more conveniently and return to their lives earlier than was possible previously. We suspect that this will lead more patients to complete therapy, as treatment inconvenience, distance from a cancer centre, and cost have been barriers to treatment in the past.

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