

Implementation and experiences of an intraoperative radiotherapy service

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Background

Intraoperative radiotherapy (IORT) using a miniature X-ray source can potentially impart the same clinical benefit as several weeks of post-operative external beam radiotherapy (EBRT), in a high dose single fraction. The potential time and cost benefits to cancer patients are significant, since IORT could replace several weeks of fractionated EBRT.

Methods

We describe our initial experiences of IORT using the Zeiss Intrabeam™ IORT system for treating early stage breast cancer and invasive intracranial malignancies. Implementing this new treatment modality requires a multidisciplinary approach drawing on the expertise of surgeons, oncologists, physicists, anaesthesiologists, nurses and pathologists. Co-ordination of the team is facilitated by an oncology nurse.

Results

We have treated in excess of 60 patients in 20 months. For breast cancer patients, the treatment times ranged from 16.79 to 36.21 minutes (mean = 30.06) and the applicator sizes ranged from 3.0 to 5.0 cm (median = 4.5 cm). The prescribed dose is 5 Gy to a spherical volume 1 cm from the applicator surface. For brain cancer patients, the treatment times ranged from 15.07 to 29.04 minutes (mean = 19.56) and the applicator sizes ranged from 1.5 to 3.5 cm (median = 2.5 cm). Mean dose was 11 Gy prescribed to a spherical volume 0.5 cm from the applicator surface. Radiation surveys of the operating theatres during IORT showed that lead glass screens and additional lead shielding at the treatment site are essential.

Conclusions

A multidisciplinary team working with a team co-ordinator is essential for the successful implementation of any new treatment such as IORT and it has proven to be feasible and safe for breast and brain cancers. Through reliance on an oncology nurse to co-ordinate the programme, we have successfully set up an IORT service. Our experience could serve as a model for introducing IORT into other centres.