Use of intra-operative radiotherapy [IORT] alone in breast cancer patients when conventional external beam radiation therapy [EBRT] was not possible

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Although External Beam Radiotherapy (EBRT) is generally regarded as safe for most patients, there are a number of side effects that can limit and in some cases prevent its use in breast cancer patients. We have been using intra-operative radiotherapy (IORT) with the Intrabeam technique in the randomised TARGIT trial since 2000. In special circumstances, we treat patients with IORT alone when EBRT is not feasible. The aim of this study was to avoid unnecessary mastectomy whilst maintaining a high probability of long term local tumour control in this cohort of patients. We present our preliminary results of this non-randomised study of consecutive female patients. Their treatment involved wide local excision (WLE) followed by IORT, in some instances, under local anaesthetic.

IORT is delivered using the Intrabeam system which contains a miniature electron gun and accelerator. Soft x-rays (50kV) are emitted from the point source, delivering 20Gy to the applicator surface located in the tumour bed. 13 patients have been treated in this way, with a mean follow-up of 21 months (range 1-59). The special circumstances and follow-up outcomes are contained in the table below.

In conclusion, we believe that IORT using Intrabeam offers a safe and effective method of delivering radiotherapy to breast cancer patients in whom EBRT is not an option. There were no loco regional recurrences or radiation induced complications in this series however, one patient developed a second primary in the same breast.

The TARGIT Trial

Case No. | Age | Reasons for IORT alone | Outcome
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1 | 53 | Patient declined standard radiotherapy (deep concerns about side-effects, long distance to travel) | No recurrence
2 | 48 | Recurrent breast cancer after WLE and EBRT, refused mastectomy | Second primary in different quadrant and metastatic breast carcinoma
3 | 60 | Severe bronchiectasis | No recurrence
4 | 78 | Severe Chronic Obstructive Pulmonary Disease with poor lung function | Died 18 months post-surgery from bronchopneumonia without signs of local recurrence
5 | 54 | Past history of lymphoma and mantle radiotherapy, declined mastectomy | No recurrence
6 | 56 | Myasthenia gravis | Multiple recurrence, mainly bony sites (18m), subsequent local recurrence (24m)
7 | 90 | Co-morbidities | No recurrence
8 | 68 | Severe Parkinson’s, wheelchair bound | No recurrence
9 | 86 | Total blindness | No recurrence
10 | 56 | Severe obesity and previous problems with EBRT for treatment of contralateral breast cancer | No recurrence
11 | 85 | Minimal intervention because of age | No recurrence
12 | 68 | Hodgkin’s disease, previously treated with mantle radiotherapy | No recurrence
13 | 40 | Brain metastases - IORT was delivered as palliative treatment | No recurrence

The IORT Technique

The TARGIT Trial