fraction for all patients, using a balloon applicator (ranging from 3-4 and 4-5cm in diameter) placed into the surgical bed. Distance from the applicator to the skin surface was verified intraoperatively through ultrasound monitoring. Energy of 50 kV was used, in a dose of 20 Gy prescribed to the surface of the balloon, with a mean treatment duration of 550 seconds. Protection of the chest wall was performed with an attenuation disk that varied between 4 and 6 cm in diameter. Clinical, surgical and pathologic parameters, as well as the immediate and late toxicity were evaluated using the EORTC score.

Results: The median age of the patients was 65 years (range 42 to 89), stage pT1N0M0, pT1N1M0, and pT1N2M0. All patients had sentinel node assessment in the OR. Tumor size ranged between 0.4 and 2 cm. In 57% of the cases, the pathology revealed invasive ductal carcinoma without an extensive intra-ductal component. There were no post-operative complications and the immediate skin reaction was mild, without any grade 3/4 acute toxicity or delayed healing. Two cases of seroma and two cases of mild subcutaneous fibrosis were reported. With a median follow-up of 18 months, there were no local recurrences. There was one case of axillar recurrence one year after treatment.

Conclusions: IORT using the Electronic Brachytherapy System by Xoft as part of the conservative treatment of breast cancer is a safe procedure, with low morbidity. The low incidence of side effects as well as the short treatment time inside the OR has led to a growing interest in using this treatment solution. Following these patients will allow us monitoring any delayed reactions and subsequent cosmetic effect as well as the local control rate and survival.

PD-0483
Evaluation of IOERT with reduced dose in selected early breast cancer: mono-institutional experience
M. Guenzl1, G. Blandino1, D. Alo1, E. Configliacco1, S. Garelli1, M. Gusinu1, R. Corvò1
1IRCCS San Martino IST, Oncology Radiotherapy, Genova, Italy

Purpose/Objective: Intraoperative Electron Radiation Therapy (IOERT) has been demonstrated to be a good method of treatment of early breast cancer (BC) in selected patients (pts). In this study we evaluate the efficacy of a single dose of 18Gy given to the tumor bed during the surgery in order to reduce late toxicity with respect to the standard 21 Gy dose.

Materials and Methods: From January 2009 to December 2011, 72pts with diagnosis of early BC underwent IOERT as exclusive treatment after breast conservative surgery. The median age was 66 years (range 47-84). The criteria of eligibility were: tumors smaller than 10mm, sentinel node N0, negative surgical margins (±5mm). All pts received standard dose of 18Gy with electrons beams of 4-10 Mev energy, given by a mobile linear dedicated accelerator. The choice of the collimator diameter was based on the primary tumor size and site (range 40mm-60mm): the most used was 50mm, in 48pts (66%). The protection of the thoracic wall was achieved using aluminum discs of diameter 7cm (range 5-8).

Results: With median follow up of 36 months (range 12-60) in all patients the acute and subacute toxicity was mild, there were no delays healing, wound dehisence or infection. Late toxicity (fibrosis) at one year was G0 in 32pts(43%), G1 in 26pts(36%), G2 in 15(20%). At 2years: G0 in 46pts(64%), G1 in 22 pts(30%), G2 in 4pts(6%). At 3 years G0 in 52pts(73%), G1 in 20pts(17%). At 4 years we have 23 pts in follow-up and only 8pts(35%) have fibrosis G1. The aesthetic result is excellent/good in 87% pts , acceptable in 13%. One patient submitted local recurrence (1.4%)

Conclusions: The short follow up and the limited number of patients do not allow us not to draw definitive conclusions, but at present patients are not experiencing an excess of local relapse with the 18Gy single IOERT dose.

OC-0484
Reexcision rescanning in a 4D anthropomorphis phantom for evaluation of motion-mitigated, PBS proton therapy
R.L. Perrin1, M. Peroni1, K. Bernatowicz1, A. Schaetti1, A.K. Knopf2, M. Zakova3, D. Oxlcy1, A. Mayor1, S. Safai1, T.C. Parke1, D.C. Weber1, T. Lomax1
1Paul Scherrer Institute (PSI), Centre for Proton Therapy, Villigen PSI, Switzerland
2Institute of Cancer Research, Joint Department of Physics, London, United Kingdom
3CEM Centre Suisse d’Electronique et de Microtechnique SA (CEM), Innovative Design, Landquart, Switzerland

Purpose/Objective: To investigate the ability for rescanned PBS proton therapy to recover the dose distributions in mobile lung tumours, with phantom measurements within a dynamic, anthropomorphic, thorax phantom.

Materials and Methods: For dosimetric measurements in a geometry similar to a lung cancer patient, a dynamic, anthropomorphic thorax phantom was employed. This consists of a tumour (wooden sphere) moving within an inflating lung, enclosed in a rib cage, complete with intercostal muscle and skin layers. Three planes of Gafochrome film in the coronal plane were used to measure the dose distributions resulting from PBS proton therapy for a range of rescan factors (≤8) and peak-to-peak motion amplitudes (4-10 mm). A PBS treatment was planned using an in-house planning system. The ITV was generated from the maximum excursion of the target as visualised on the mean projection CT calculated from a 4DCT scan. Two Single Field Uniform Dose (SFUD) fields (1.8 Gy prescribed dose) were employed at the following angles (gantry, couch): (-25,30), (+45,0). To allow for up to 8-times scaled, volumetric rescanning per field, optimization of each field was performed with an 8-times higher cut-off for the lowest deliverable pencil beam weight. Prior to delivery, phantom and film positioning was checked and corrected using CT imaging, as performed for all patients. Table shifts were applied to match the ribs, and the tumour mid-ventilation position was aligned cranio-caudally by adjusting the position of the tumour in the lung. The phantom was programmed to move with a sinusoidal motion with maximum excursions of up to 4 and 10 mm for deliveries with rescan factors between 1 and 8. Reference films were acquired with the phantom and tumour stationary, and with a moving tumour with no rescanning.

Results: Hot spots of up to 116% of the prescribed dose, with a pattern typically expected with the interplay effect, were clearly observed on the film with 10 mm motions (see Figure 1), while with 4 mm motion, only a faint interplay pattern was observed. However, experimental error translating to an uncertainty in the homogeneity index (D10-D90) of typically 5% shadowed this result. With a rescan factor of 8, even in the case of 10 mm motion, dose homogeneities similar to those of the static case could be achieved (D10-D90 of static and 10 mm...