(b) the Mammotome Vacuum biopsy system for large excision biopsy and
(c) the Accubeam (PeC) for localised portable radiotherapy.

A Fisher Mammotest prone table uses two digital mammographic images 30° apart to stereotactically compute location of non-palpable lesion in the breast. The patient lies prone while the breast is suspended between the image sensor and a small windowed compressing pad, under the table. The Mammotome vacuum biopsy apparatus is directed to the correct location through a tiny incision on the breast made under local anaesthetic. With the Mammotome, it is usually possible to take about 1–2 cm^3 of tissue. This is adequate for tissue diagnosis, is frequently therapeutic for benign lesions and may even achieve nearly complete excision for small screen detected malignant lesions. Accubeam (PeC) is an ingenious device electron-beam driven soft x-ray source which provides a point source of low energy X-rays at the tip of a 3.2 mm diameter tube. With a 50 kV machine, the typical dose is about 130 Gy and 20 Gy at the surface of the tumour in about 12 minutes. In cases of elderly infirm women, it is possible to deliver therapeutic radiation in one sitting, under local anaesthetic with precise localisation in the centre of the tumour. With this approach, the area of maximum tissue anoxia – the most likely site of failure receives the highest dose and the normal tissues receive the least.

As a proof of principle, we have treated 3 patients. In every patient, there was near complete-loss of tumour vascularity on MRI within 6 days of treatment. The lump became impalpable by 3 months and has remained so at a median follow up of 18 months. The combination of these three evolving technologies can yield the diagnosis, localisation, part excision and radiotherapy in a single session.

O-109. CAN ULTRASOUND IMPROVE THE ACCURACY OF DELIVERY OF ELECTRON BOOST TREATMENT FOLLOWING BREAST CONSERVING SURGERY?

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The purpose of this study was to compare the accuracy of boost planning using conventional technique with planning using ultrasound to delineate tumour bed.

Twenty patients who underwent wide local excision and were prescribed radiotherapy to the involved breast plus boost where selected randomly. Time interval between surgery and the boost planning varied between 9 months to 6 weeks.

Standard boost planning (relying on examination, information from surgical notes, previous mammograms and ultrasound) was undertaken, this was followed by an ultrasound scan to identify the tumour bed and accordingly optimum boost planning area was calculated (cavity size plus 1 cm margin plus $\frac{1}{2}$ cm error margin). Comparison of the relative size and overlap of the standard and optimum boost fields were undertaken and estimate of potential under and over treated areas were made.

Results showed that 45% (9 out of 20) had 100% overlap, 20% (4 out of 20) had 90–99% overlap, 30% (6 out of 20) had 80–89% overlap and 5% (1 out of 20) had only 10% overlap.

Under treated area values (accepted at 0% of optimum boost area size) showed that 45% (9 out of 20) had 0% under treated area and 55% had calculated under treated area, these were divided as: 25% (5 out of 20) had 1–10% under treated area, 20% (4 out of 20) had 11–20% under treated area, 5% (1 out of 20) had 21–30% under treated area and 5% (1 out of 20) had 90% under treated area.

Over treated area values (accepted at 300% of optimum boost area size) showed that 80% had values within 300% and 20% had values over the 300%.

In conclusion this study demonstrated that with conventional breast planning, a significant number of patients (around 50%) are under treated and that ultrasound can be useful for accurate planning and reducing the chance of not including the tumour bed in the planning volume.

O-110. SERIAL MONITORING OF SERUM HER-2/neu IN WOMEN WITH METASTATIC BREAST CANCER

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The extracellular domain (ECD) of HER-2/neu is shed into the serum of normal women and is elevated in women with metastatic breast cancer (MBC). Our stuides have been conducted with a standardized ELISA, which was specifically validated for measuring ECD in human serum.

In this study the serum ELISA has been used to analyze serial samples from over 100 women with MBC, as well as samples form over 200 normal women, and women with benign breast diseases or non-malignant, non-breast diseases. The upper limit of normals was established at 15 ng/ml. Longitudinal measurements of serum HER-2/neu ECD were found to correlate with changes in disease status in greater than 80% of cases. We found that increases of 20% or greater from previous determinations were indicative of progressive disease, while decreases of 20% or greater were reflective of a response to therapy or lack of progression.

Data from our study demonstrate that some women with MBC who had elvetad ECD serum levels did not respond as well to hormone therapy as women with normla serum HER-2/neu levels.

Clinical response to Herceptin could also be monitored by measuring the serum HER-2/neu levels.

In summary quantification of the serum HER-2/neu ECD may have several clinical applications, such as monitoring women with metastatic breast cancer or predicting response to hormone therapy. Serum HER-2/neu measurements provide a real-time opportunity to assess a woman's Her-2/neu status rather than depending on a semi-quanititative retorspective tissue.