axillary lymph nodes although the same exists for patients with 4 or more positive nodes. But several recent publications (20 year result of British Columbia Study and DBCG 82 Protocol published by Overgaard et al) challenge this separation between '1 to 3' and '4 or more' positive axillary nodes as a relevant descriptor of indication of PMRT. This was the impetus that led us to review and analyze retrospectively from our institute data, the impact of post mastectomy radiotherapy (PMRT) in this controversial group.

Material and Method: Records of 785 patients with T1, T2 tumors who were registered in our department following mastectomy with axilla dissection with <4 positive axillary nodes between 2002 and 2009 were analyzed. 127/785 patients had 8 or less nodes dissected (as found in histopathology reports) and as such were excluded from the analysis. Of the remaining 658 patients, **528** received no PMRT, as per consensus. But **130** patients, as found in record, had received PMRT (possibly they appeared to be non-compliant regarding follow up). Locoregional recurrence, distant failure, disease free survival and overall survival of these 130 patients were studied and compared with 528 patients who were not offered PMRT.

As per erstwhile institutional policy, all patients had received FAC chemotherapy for 6 cycles. Receptor positive patients (164/528 of non-PMRT and 42/130 of PMRT subsets) were on Tamoxifen or an A.I.

Results: At a median interval of 30 months 132/528 patients not receiving PMRT suffered locoregional recurrence (chest wall recurrence alone in 36/528, supraclavicular recurrence in 81/528, chest wall + supraclavicular recurrence in 15/528, axillary and IMN recurrence in none). On the contrary only 4/130 patients receiving PMRT had locoregional failure ($p < 0.0001$). Distant metastasis was recorded in 37/528 of non PMRT subset and 8/130 of PMRT subset (p = NS). Survival data till September 2008 showed 4/130 deaths among PMRT subset against 26/528 of non PMRT (p = NS). 121/130 of PMRT are living without disease, contrary to 432/528 of non PMRT ($p = 0.001$).

Conclusions: This retrospective analysis revealed statistically significant reduction in locoregional recurrence as well as increased disease free survival with PMRT in T1 or T2 breast cancer patients with 1−3 positive axillary nodes. Deprivation of adjuvant radiotherapy for this subset of patients appears to be unjustified.

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Outcome of Breast Cancer Patients with Isolated Supraclavicular Fossa Lymph Node Recurrence Treated with Radiotherapy

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Background: The incidence of isolated supraclavicular fossa (SCF) nodal recurrence in breast cancer is between 4.5−7% [1, 2]. Published 2 & 5 year survival rates for patients with SCF node metastases are 52% & 34% [3]. It is unclear whether isolated SCF recurrence is a harbinger of distal disease or whether aggressive local treatment can result in cure. This is a retrospective study of the outcomes for breast cancer patients who received radiotherapy (RT) for isolated SCF recurrence.

Materials and Methods: Breast cancer patients who had received treatment with RT for SCF disease recurrence between 2005 & 2010 were identified from the Mount Vernon Cancer Centre (MVCC) coded 'Oracle' treatment database. RT treatment & fractionation were obtained from the database & clinical outcomes were assessed from the patient notes. Local lymph node control (LLNC), overall survival (OS) from SCF recurrence & distant disease free survival (DDFS) from radiotherapy were evaluated according to treatment received.

Results: 33 patients were identified with a median age of 57 (range 34−89). The ER/PR status was: 20 (61%) positive & 13 (39%) negative. The HER2 status was: 12 (35%) positive, 15 (45%) negative & 6 (20%) unknown. The RT regimens (Gy/#) used were: 40 Gy/15# in 3 weeks (n = 13), 20 Gy/5# in 1 week (n = 5), 50 Gy/25# in 5 weeks (n = 9), 30 Gy/10# in 2 weeks (n = 2), 18 Gy/4# in 1 week (n = 1), 8 Gy/1# in 1 day (n = 1), 45 Gy/15# in 3 weeks (n = 1) & 27 Gy/6# in 3 weeks (n = 1). 18 (55%) patients received chemotherapy & 21 (64%) received endocrine therapy prior to RT. Median LLNC was 45 (range 1–133) months with a median DDFS of 12 (range 3−60) months. Median OS was 25 (range 2−85) months from recurrence with 4 (12%) patients surviving >5 years from SCF recurrence. A significant difference was seen for DDFS & OS in favour of ER +ve status ($p < 0.05$ & $P < 0.001$) & in OS for longer RT regimens ($P < 0.05$).

Conclusions: Outcomes at MVCC are akin to those published as only 12% of patients survived for >5 years following RT. Our data also demonstrates that ER status influences DDFS and OS is better with longer hyperfractionated regimens & +ve ER status. This however, may have been biased by confounding factors, such as co-morbidity, and furthermore the sample size was small. A prospective analysis is suggested to establish a stronger evidence base for best practice in this patient group, including evaluation of outcomes for those patients not treated with RT.

References

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Preclinical Assessment of Multidirectional Firing Laser Ablation in Porcine Liver and Human Breast Tissue

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Background: Minimally-invasive thermal ablation is a promising new tool for local destruction of small carcinomas of the breast. Currently, cryosurgery, radiofrequency ablation, laser-induced thermal therapy, microwave ablation, and high-intensity focused ultrasound ablation are clinically available local ablation modalities. Laser-induced thermal therapy requires a laser fiber to guide the light energy directly into the tissue to be treated. Most laser fibers are designed for forward firing i.e. the light is emitted at the distal end along the optical axis of the fiber. But laser ablation using a forward firing fiber cannot transmit the energy evenly to the lesion, so the exact size of the thermal lesion cannot be predicted.

We developed multidirectional firing laser fiber using the femtosecond laser and an arc discharging process. The aim of this study was to compare the ablation properties of forward firing laser fiber and multidirectional firing laser fiber in relation to the application time and power.

Materials and Methods: Laser ablations with each fiber were performed in porcine liver and human breast tissue ex vivo. Laser energy was applied at powers of 5, 7.5 W and 10 W, with exposure times between 5 and 15 minutes. Directly after ablation, the tissues were cut open along the applicator axis. The lesions were macroscopically inspected. We regarded clearly demarcated portions of the visibly damaged area as necroses and measured each axial and transversal diameter.

Results: Gross pathologic examination showed a bullet-shaped thermal lesion applied with forward firing fiber and more circular-shaped thermal lesion with multidirectional firing fiber. We got the same results in porcine liver and human breast tissues. When a forward firing fiber was used, the greatest ablation diameters ranged from 15 mm at the lowest dose (5 W, 5 minutes) to 30 mm at the highest dose (10 W, 15 minutes). Multidirectional firing fiber created ablation zones as large as 40 mm in greatest diameter with the lasers operating at 10 W for 15 mins.

Conclusions: The results of this study demonstrated a dose response relationship for laser-induced thermal therapy. The application of higher energy volumes leads to the induction of larger lesions up to complete coagulation of the available organs. And we found the thermal lesions with multidirectional firing fiber were more spherical shape and easily predictable the size.

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The Role of VEGF Gene Polymorphisms in the Development of Distant Metastases in Postmenopausal Breast Cancer Patients

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Background: Vascular endothelial growth factor (VEGF) is a key regulator of tumor-induced angiogenesis and is required for tumor growth and distant tumor spread. Aim of the present study was to evaluate the role of VEGF polymorphisms and haplotypes for metastatic progression of breast cancer in postmenopausal women.

Methods: We carried out a prospective study including 584 postmenopausal breast cancer patients from the Austrian TIGER ("tumor of breast tissue: incidence, genetics, and environmental risk factors") study. Development of metastases was examined in regular follow-up investigations. Seven VEGF polymorphisms were selected and determined by a 5′-nuclease assay (TaqMan). Haplotypes and linkage disequilibrium were determined using the Haploview program.

Results: Within a median follow-up time of 77 months (range 0–121 months), 122 (21%) patients developed distant metastases.

In a Kaplan–Meier analysis, carriers of the −634G>C polymorphism were at decreased risk of developing distant metastasis (p = 0.027) and