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Poster

Clinical application of ultrasound Elastography for detection of ductal carcinoma in situ of the breast

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Background: Diagnosis of ductal carcinoma in situ (DCIS) reduces the subsequent incidence of invasive ductal carcinoma, but it remains difficult to detect. We have reported the ultrasound Elastography has been useful to detect invasive breast cancers. ¹ The purpose of this study is to investigate the clinical application of ultrasound Elastography for evaluation of DCIS.

Material and Methods: Thirty-nine female with pathologically confirmed DCIS (median age, 54.2 years; age range, 32–81 years) were included in the study. Conventional ultrasonography (US) was applied for screening and real-time US Elastography (Hitachi, 7.5- to 13-MHz probe) was applied for evaluation at Tsukuba University Hospital between August 2003 and November 2007. The results were compared to those of the ACR's BI-RADS sonography categories (benign = 2 and 3, malignant = 4 and 5) and to the results of Elastography by Tsukuba elasticity score (1 to 5, scores 1–3 = benign, 4–5 = malignant) according to the degree and distribution of strain induced by light compression. Non-mass image-forming lesions described by Japan Association of Breast and Thyroid Sonology was categorized independently. ² In the guidelines, non-mass image-forming lesions are classified as follows: duct dilatation, multivesicular pattern, low echo area in the mammary gland, and architectural distortion.

Results: Breast conserving operation was performed in 25 patients (64.1%) and mastectomy was performed in 14 patients (35.9%). Median size of the lesion was 13.0 mm (4.0 mm to 28 mm). Fifteen cases (38.5%) were categorized as non-mass image-forming lesion by ultrasound. Of 39 cases, the sensitivity of US (Category 4 and 5) was 79.5%, and of Elastography (Score 4 and 5) was 53.8%. Among 8 cases with diagnosis of category-3, 5 cases were scored 4 or 5 by Elastography. Integrated US and Elastography diagnosis achieved sensitivity of 92.3% (36/39 cases). As for 15 cases of the non-mass image-forming lesions, sensitivity of US, Elastography, and integrated US/Elastography were 86.7%, 46.7%, and 93.3% respectively.

Conclusion: Elastography with the proposed imaging classification showed slightly lower sensitivity for evaluation of DCIS compared to conventional US by single modality. However the integration of two modalities achieved higher sensitivity. Elastography is easy to perform and offers additional information to conventional US for DCIS detection.

References

- [1] Itoh A, Ueno E, Tohno E, et al. Breast disease: clinical application of US elastography for diagnosis. *Radiology* 2006;239:341–50.
- [2] Japan Association of Breast and Thyroid Sonology. *Guideline for Breast Ultrasound-Management and Diagnosis*. 2004, pp. 35–37, 53–60.

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Poster

Relatively high local recurrence rates following mastectomy for high grade pure Ductal Carcinoma In-Situ (DCIS) with very close or positive margins – a potential indication for postmastectomy radiotherapy

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Background: Mastectomies generally result in very high local control rates for pure DCIS. However, close or involved tumor margins are occasionally encountered despite this radical procedure. Although close margins and high grade disease are known predictors of local recurrence after a lumpectomy, data regarding the rate of relapse following a mastectomy is essentially non-existent.

Materials and Methods: From 1994–2002, the pathology reports of 574 patients who underwent mastectomies at our institution for pure DCIS were retrospectively reviewed. Eighty-four patients were found to have margin of less than 10 mm. Four patients who underwent postoperative radiotherapy were excluded, leaving 80 patients for this analysis. Thirty-one patients had margin <2 mm whereas 49 patients had margin 2.1–10 mm. High grade disease was observed in 47 patients.

Results: With a minimum follow up of 60 months, 6 of 80 (7.5%) patients had local recurrences. In 16 patients who had both a very close margin (ie <2 mm) and high grade disease, five local recurrences (31%) were noted, as opposed to one local recurrence in 64 patients (1.5%) who had lacked both risk factors, $P < 0.001$.

Conclusions: This review strongly suggests that patients with pure high-grade DCIS who have undergone mastectomies with margin <2 mm have

a significantly higher-than-usual incidence of local recurrence, and should receive serious consideration for postmastectomy radiotherapy.

Thursday, 17 April 2008

12:30–14:30

POSTER SESSION**Local regional treatment/Radiotherapy**

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Poster Discussion

The effects of radiotherapy on normal tissues in early breast cancer: results of the UK standardisation of breast radiotherapy (START) trials.

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Background: To determine normal tissue damage following radiotherapy (RT) fractions >2 Gy in women with early breast cancer. In the UK START trials (ST-A and ST-B) a randomised comparison of 41.6 Gy or 39 Gy each in 13 fractions was tested against a control dose of 50 Gy in 25 fractions (ST-A) and 40 Gy in 15 fractions against the same control (ST-B).

Methods: Women in the quality of life (QL) sub-study completed the Body Image Scale (BIS), the EORTC BR23 QL, and protocol specific items for post RT effects, namely skin appearance and (breast conserving surgery (BCS) patients only) breast appearance, shrinkage and hardness. QL was completed after surgery +/- chemotherapy but before RT and at 6, 12, 24 and 60 months follow-up. For BIS and BR23 breast and arm symptoms comparison of subscale scores between RT schedules and change from baseline were tested using weighted GEE models including type of surgery. Individual breast and arm symptom items were classified as to whether patients had ever reported levels of "quite a bit" or "very much", and survival analyses used to compare schedules.

Results: 2180 (99%) women completed baseline QL (mean age 56.9 years, range 26–87). 82.9% of patients underwent BCS and 33.3% received adjuvant chemotherapy. In both ST-A & -B, there was no significant impairment of BIS or in breast or arm symptom scores by any one of the regimens compared with the others. Across regimens a sustained improvement from baseline was observed for BIS scores ($p < 0.001$). Rates of change in skin appearance following RT were significantly lower in 39 Gy vs 50 Gy (ST-A) (HR 0.63 (0.47–0.84)) and 40 Gy (ST-B) vs 50 Gy (HR 0.76 (0.60–0.97)). There was a suggested dose-response relationship for breast hardness for 39 Gy vs 50 Gy (ST-A) (HR 0.79 (0.61–1.04)) and overall change in breast appearance for 40 Gy vs 50 Gy (ST-B) (HR 0.84 (0.69–1.03)).

Conclusions: Patient self-assessments showed small differences in the impact of different RT regimens on normal tissues, consistent with the clinical outcomes of similar rates of tumour control and normal tissue damage in the hypofractionated schedules compared with the standard RT schedule.

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Poster Discussion

The impact of a boost dose on the local recurrence rate in high risk patients after breast conserving therapy – results from the EORTC boost-no boost trial

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Background: To investigate the long term impact of a boost dose on the local control rate, in patients who had breast conserving therapy (BCT) for stage I and II breast cancer, with a special emphasis on a subset analysis to identify the effect of the boost on high risk patients.