

analysis of the sentinel lymph node (SLN) thereby avoiding a second operation and reducing patient anxiety. It is not clear how the sensitivity of OSNA will affect the rates of axillary clearance.

Materials and Methods: OSNA analysis was introduced at our institute in February 2011. We assessed consecutive patients over a 6 month period (February 2011 – July 2011) who underwent OSNA analysis of the sentinel lymph node and compared this to the immediate 6 months period prior to the introduction of OSNA where the SLN was assessed using standard histopathological methods. Data was recorded on OSNA results, histopathology of the SLNB, subsequent axillary surgery and primary tumour characteristics. Of the three possible outcomes following OSNA analysis of specimens, we performed axillary clearance if the OSNA result revealed micrometastasis (+) or macrometastasis (++) in the pre-OSNA group, axillary clearance was also performed if the sentinel lymph node biopsy revealed micrometastasis or macrometastasis. Patients found to have isolated tumour cells on histopathological examination were not offered further axillary surgery.

Results: Fifty-two patients underwent OSNA analysis during this period (n = 52), mean age 61.6 years (range 34–84 years) and primary tumour size varied from 6–53 mm (mean 27.6 mm). OSNA result was positive in 22 patients resulting in an axillary clearance rate of 42.3%. In contrast, in the pre-OSNA group (n = 55), mean age was 58.0 years (range 32–78 years) and primary tumour size varied from 3–55 mm (mean 24.4 mm). Axillary clearance rate in this group was less than half compared to the OSNA group at 18.2%. The number of patients with micrometastasis was similar in either group.

Conclusions: The introduction of OSNA analysis in our institute has enabled rapid intra-operative assessment of the SLN. Our axillary clearance rates have more than doubled during this period despite detecting similar numbers of patients with micrometastasis. The results of this study are in keeping with the recent concerns regarding the overtreatment of the axilla in breast cancer patients. This has a significant bearing on management of the axilla as well as logistical planning of theatre sessions to accommodate longer operating sessions.

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Poster

A Comparative Study of One-step Nucleic Acid Amplification (OSNA), Frozen Section and Touch Imprint Cytology for Intra-operative Assessment of Breast Cancer Sentinel Lymph Node – China Multicenter Study CBCSG-001c

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Background: Sentinel lymph node biopsy has become the standard staging technique for clinically node-negative breast cancer and there is a demand of more sensitive and accurate assessment of sentinel lymph nodes (SLNs). The conventional procedures for intraoperative assessments of SLNs were frozen section (FS) and touch imprint cytology (TIC). They both require experienced pathologists and are not standardized, and they also exhibit low sensitivity in SLN micro-metastases. The China Breast Cancer Clinical Study Group (CBCSG)-001c multicenter study is to evaluate the optimal intra-operative assessment of breast cancer SLNs by a comparative study of one-step nucleic acid amplification (OSNA) assay with FS and TIC.

Materials and Methods: From Feb. to Dec. 2010, 552 consecutive prospective patients were enrolled from five centers across China. The study was approved by the ethics committee of each center and each patient provided informed consent. SLNs were cut into alternating ~2 mm blocks. The odd blocks were tested by the OSNA assay intraoperatively, and the even ones were assessed by postoperative histology. Four 4–6 µm thick sections were taken every 200 µm per block. Metastases were classified according to the 6th criterion of American Joint Cancer Committee, and isolated tumor cells [≤0.2 mm, pT0(i+)] were considered node negative in this study. In addition, intraoperative histological assessments were performed on the even blocks of 211 patients by FS and all blocks of 552 patients by TIC.

Results: A total of 1188 SLNs were excised from 552 patients. Overall performance of the OSNA assay compared to postoperative histology was

accuracy 91.4%, sensitivity 83.7%, specificity 92.9%, positive predictive value 69.1%, and negative predictive value 96.8%. The assay could be performed in a mean time of 37.3 min. The sensitivity of the OSNA assay was higher than FS (211 patients, 77.6% vs. 69.7%, not significant, P = 0.286) and was significantly higher than the TIC (552 patients, 83.6% vs. 76.2%, P = 0.044). When assessing nodes with macro-metastases, the sensitivity of the OSNA assay was similar to FS (59 nodes, 86.4% vs. 83.1%, P = 0.791) and TIC (141 nodes, 90.8% vs. 90.1%, P = 1.00). However, when assessing nodes with micro-metastases, the sensitivity of the OSNA assay was higher than FS (17 nodes, 47.1% vs. 23.5%, not significant, P = 0.289) and was significantly higher than TIC (48 nodes, 62.5% vs. 35.4%, P = 0.007). After discordant case investigation, the sensitivity of the OSNA assay was significantly higher than both FS and TIC (both P < 0.05). The PPV value of the OSNA assay result [++] and [+] on macro-metastases was 83.2% and 19.0%, and on the nSLN metastases was 42.2% and 12.2%, respectively.

Conclusion: The OSNA assay is an accurate and rapid intraoperative assay for assessing breast SLNs and superior to FS and TIC, especially for micro-metastases. The quantitative molecular assessment of the OSNA assay [++] could predict SLN macro-metastases and nSLN metastases. The OSNA assay is objective, standardized and reproducible, and suitable for daily medical practice.

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Poster

Partial Breast Reconstruction Using Intercostal Artery Perforator Flap (ICAP) in Breast Cancer Patients

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Background: Oncoplastic breast surgery has been used widely as a treatment protocol for breast cancer. One of them, intercostal artery perforator (ICAP) flap can provide adequate cover without sacrificing any muscle and allow closing of the donor sites in inconspicuous sites. Therefore, the oncoplastic volume replacement techniques using local flap which can cover the volume of breast enough were indicated, especially ICAP was suggested. This study describes the use of intercostal artery perforator flap techniques in partial breast reconstruction.

Patients and Methods: From March of 2010 to September of 2011, 17 patients with breast cancers received the breast reconstruction using ICAP flap. All patients which were selected had small to moderate sized defect on breasts, middle aged, not having sharp sense to scar. The technique was to make an incision through skin and fatty tissue, find the perforator using doppler, dissect from both margin of the flap. The raised flap was taken to transposition at defect site through the tunnel and inframammary fold was reinforced with nonabsorbable suture.

Table 1. Characteristics of 17 Patients Treated for Breast Cancer using ICAP

Patient	Age (yr)	Type of Tumor	Location of Tumor	Weight of Tumor (g)	Tumor Stage	SLN Status	Complication	Adjuvant Therapy
1	60	IDC	LIQ	70	I	Negative		CT, RT
2	47	IDC	LOQ	95	I	Negative	venous congestion	CT, RT
3	46	IDC	LOQ	71	I	Negative		CT, RT
4	39	IDC	LOQ	81	IIA	Negative		CT, RT
5	45	IDC	LOQ	88	IIB	Positive		CT, RT
6	50	IDC	UOQ	82.5	IIA	Negative	venous congestion	CT, RT
7	56	IDC	LOQ	77	I	Negative		CT, RT
8	38	IDC	LOQ	162	IIa	Positive		CT, RT
9	58	DCIS	LOQ	42.5	I	Negative		RT
10	56	DCIS	UOQ	65	I	Negative		RT
11	53	IDC	LOQ	150	I	Negative		CT, RT
12	42	IDC	LIQ	98	IIB	Negative		CT, RT
13	51	IDC	LOQ	83.5	I	Negative		CT, RT
14	44	IDC	UOQ	137.5	IIB	Negative	wound disruption	CT, RT
15	46	IDC	UOQ	112	I	Negative		RT
16	38	IDC	LOQ	77	I	Negative	venous congestion	CT, RT
17	58	IDC	UOQ	132	IIa	Positive		CT, RT

DCIS, ductal carcinoma in situ; IDC, invasive ductal carcinoma; ILC, invasive lobular carcinoma. There were no tumor recurrences.

Results: The mean age was 48.6 years and the average follow-up interval was 6 months. Patients were divided into five groups according to location of tumor (5 UOQ, 0 UIQ, 9 LOQ, 2 LIQ, 1 central). The average specimen weight was 93g. Complication was developed in 4 cases including 3 cases of venous congestion, but self limited, and 1 case of wound disruption on inframammary fold suture area. The majority of patients were satisfied with the cosmetic result.

Conclusions: Intercostal artery perforator flap (ICAP) technique can be reliable and useful technique in correcting breast deformity after breast

conserving surgery, especially in the patients which had small to moderate sized defect on breasts.

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Poster

Oncoplastic Techniques for Reconstruction of Partial Breast Defects based on Tumor Location and Excised Breast Volume in Small- to Moderate-sized Breast

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Background: Oncoplastic breast surgery has become an increasingly popular treatment for breast cancer. However the average breast size of Korean women is not as large as that of western women, many women may compromise the cosmetic outcome especially with small to moderate sized breasts. This study provides a comprehensive overview of oncoplastic techniques based on tumor location.

Materials and Methods: From January of 2007 to June of 2011, 134 women underwent breast-conserving surgery with various oncoplastic techniques. If the excised breast volume in patients with small to moderate sized breasts was less than 100g, the patients were divided into three groups: superiorly-located group, centrally-located group (the location of breast cancer was within 2 cm from areolar margin) and inferiorly-located group. In superiorly-located group, from inner quadrant to outer quadrant, rotational flap, tennis racket technique, reduction technique (inverted T, vertical type), thoracoepigastric flap, intercostal artery perforator (ICAP) flap and lateral thoracodorsal flap were applied. In centrally-located group, purse string suture, linear suture, reduction technique, thoracoepigastric flap, ICAP flap and adipofascial flap were applied. In inferiorly-located group, tennis racket technique, reduction technique, thoracoepigastric flap and ICAP flap were applied. Regardless of the location of breast tumor, if excised mass weight was over 100g, volume replacement technique was required. If excised mass weight was from 100g to 150g, ICAP flap and thoracodorsal artery perforator (TDAP) flap was performed. And if over 150g, latissimus dorsi myocutaneous flap was performed.

Results: The patients who had superiorly-located breast cancers underwent oncoplastic techniques including rotational flap (n=14), tennis racket technique (n=13), reduction technique (n=4), thoracoepigastric flap (n=2), ICAP flap (n=8), lateral thoracodorsal flap (n=2) and latissimus dorsi myocutaneous flap (n=17). The patients who had centrally-located breast cancers underwent oncoplastic techniques including purse string suture (n=8), linear suture (n=8), reduction technique (n=2), thoracoepigastric flap (n=2), ICAP flap (n=7), adipofascial flap (n=2) and latissimus dorsi myocutaneous flap (n=3). The patients who had inferiorly-located breast cancers underwent oncoplastic techniques including tennis racket technique (n=7), reduction technique (n=15), thoracoepigastric flap (n=1), ICAP flap (n=5), TDAP flap (n=3) and latissimus dorsi myocutaneous flap (n=11). The average specimen weight was 129.7g. Contralateral breast surgery (mastopexy, augmentation or reduction mammoplasty, and so on) was performed, if needed to restore the symmetry. The majority of patients were satisfied at the cosmetic result that evaluated in 15 months.

Conclusion: Oncoplastic techniques in patients with small to moderate sized breasts also can be reliable and useful procedure in the correction of the breast deformity after breast conserving surgery.

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Poster

Radioactive Seed Localization for Non-palpable Breast Cancer – a Systematic Review

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Background: Radioactive seed localization (RSL) is an alternative to guidewire localization (GWL) to guide surgical excision of non-palpable breast cancer. This systematic review provides an overview of the available evidence on feasibility and accuracy of RSL in patients undergoing breast conserving surgery.

Material and Methods: Pubmed, Embase and Cochrane were systematically searched in October 2011 for studies addressing radioactive seed localization for non-palpable breast cancer, using an Iodine-125 seed. Studies were deemed eligible if they reported on proportion of patients with tumor positive margins after RSL, proportion of patients needing re-excision after RSL, and procedural complications.

Results: Out of the 152 hits, six studies addressing RSL in 1615 patients with non-palpable breast lesions, were included. Overall complete resection rates ranged from 73% to 97%. Three studies included over 300 patients, and complete resection rates in these studies varied between 89% and 97%. Surgeons indicated a strong preference for RSL. Risks of seed migration and placement failures were acceptable, ranging from 0–0.6% and 0–7.2% respectively.

Conclusion: Localization and subsequent resection of non-palpable breast lesions can be successfully performed using guidance of radioactive seeds. The current available scientific evidence suggest that RSL is comparable to GWL in terms of achieving complete resection rates and in reoperation rates. Additional advantages of RSL include higher efficiency and flexibility in scheduling operative procedures.

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Oncoplastic S-shaped or Reverse S-shaped Rotation Flap Reconstruction After Quadrantectomy as a New Option for Lower Half Located Breast Cancer

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Background: When performing breast conserving operations, inferior cosmetic outcome has been reported in lower half breast tumors, particularly in women with small firm breasts. We report here about the use of S-shaped or reverse S-shaped rotation flap reconstruction to improve cosmetic outcome in patients with lower half-located breast cancer.

Methods: Thirty three patients with invasive breast cancer located in the lower half of the breasts, which were more than two centimeter apart from the nipple, were included. After completing quadrantectomy, single S-shaped or reverse S-shaped incision was made from axilla to tumor site. Two triangular skin islands, one on the axilla and one overlying the tumor were marked for excision. Once the fibroglandular tissues and the additional fatty tissue of the lateral chest wall were appropriately mobilized, the breast defect was closed at the mid-point of the parenchymal thickness in order to keep the natural position of the inframammary fold.

Results: Median tumor size was 2.3 cm, ranging from 0.7 to 3.5 cm. With a median follow up of 18.5 months, ranging from 3 to 27.5 months, cosmetic outcome were good (31/33) to fair (2/33) after the radiation therapy and there was no local or systemic recurrence.

Conclusion: Clearly, this type of rotation flap reconstruction is an oncologically safe and a cosmetically sound procedure. Hopefully this rotation flap reconstruction will become more widely available and perhaps a standard procedure for lower half located breast tumors, especially in the small to medium sized breasts.

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Poster

Initial Experience with Ultrasound Detectable Clips for Intra-operative Tumour Localization by Surgeons

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Background: Biopsy of suspicious breast lesions is often followed by insertion of a metal clip to verify the location of the lesion, simplify surgical procedures that follow, or mark lesions to be treated by neo-adjuvant chemotherapy. Most clips are difficult to detect by ultrasound and require mammographic localization prior to surgery. Hydromark clips (Biopsy Sciences, Clearwater, FL) absorb water molecules, expanding to become visible by ultrasound and containing a metal clip detectable by mammography. Our objective was to check whether Hydromark clips can be detected during surgery using intra-operative ultrasound by the surgeon without the need for pre-operative needle localization.

Materials and Methods: Five patients had surgery for breast cancer after Hydromark clip placement. The clip was placed by the radiologist during biopsy in two of the patients. Three additional patients had the clip inserted by the surgeon using ultrasound guidance during surgery for sentinel node biopsy before neo-adjuvant chemotherapy. In the patients having neo-adjuvant chemotherapy, monthly ultrasound was performed to monitor the rate of decay of the sonographically detectable part of the clip. At surgery, the margins of resection were determined by intra-operative ultrasound performed by the surgeon in 4 patients, without pre-operative needle localization. One patient elected to have a mastectomy.

Results: Initial tumor size in the patients having neo-adjuvant chemotherapy was 2, 4.2 and 5 cm. The Hydromark clip remained easily detectable by ultrasound until the time of surgery at 140 to 182 days after placement. Tumor size in the patients with surgery as initial treatment was 1.8 and 0.9 cm. Closest surgical margins in the four patients who were