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ORAL PRESENTATIONS

O1

Accuracy of GE digital breast tomosynthesis versus supplementary mammographic views for diagnosis of screen-detected soft tissue breast lesions

Eleanor Cornford[1*], Anne Turnbull[2], Jonathan James[1], Rachel Tsang[1], Tayeba Akram[2], Helen Burrell[1], Lisa Hamilton[1], Sarah Tennant[1], Mark Bagnall[2], Shama Puri[2], Graham Balls[3], Yan Chen[4], Vivienne Jones[5]
[1]Nottingham Breast Institute, Nottingham, UK; [2]Royal Derby Hospital, Derby, UK; [3]Nottingham Trent University, Nottingham, UK; [4]Loughborough University, Loughborough, UK; [5]Northampton General Hospital, Northampton, UK
Breast Cancer Research 2015, **17(Suppl 1):**O1

Introduction: The aim was to compare the accuracy of standard supplementary views and GE digital breast tomosynthesis (DBT) for assessment of soft tissue mammographic abnormalities.
Methods: Women recalled for further assessment of soft tissue abnormalities were recruited and received standard supplementary views (typically spot compression views) and two-view GE DBT. The added value of DBT in the assessment process was determined by analysing data collected prospectively by unblinded radiologists working up the cases. Following anonymisation of cases, there was also a retrospective multireader review. The readers first read bilateral standard two-view digital mammography (DM) together with the supplementary mammographic views and gave a combined score for suspicion of malignancy on a five-point scale. The same readers then read bilateral standard two-view DM together with two-view DBT. Pathology data were obtained. Differences were assessed using ROC analysis.
Results: The study population was 342 lesions in 322 patients. Final diagnosis was malignant in 113 cases (33%) and benign/normal in 229 cases (67%). In the prospective analysis, the performance of two-view DM plus DBT was at least equivalent to the performance of two-view DM and standard mammographic supplementary views–area under the curve (AUC) was 0.946 and 0.922 respectively, which did not reach statistical significance. Similar results were obtained for the retrospective review–AUC was 0.900 (DBT) and 0.873 (supplementary views), which did not reach statistical significance.
Conclusion: The accuracy of GE DBT in the assessment of screen-detected soft tissue abnormalities is equivalent to the use of standard supplementary mammographic views.

O2

Breast screening interval and the characteristics of screen-detected cancers

Carl A Tupper[1*], Anthony J Maxwell[2,3], Susan Astley[2,3], Megan Bydder[2], Soujanya Gadde[2], Elaine Harkness[2,3], Yit Y Lim[2,3], Mary Wilson[2], Julie Morris[4,5]
[1]University of Manchester Medical School, Manchester, UK; [2]Nightingale Centre and Genesis Prevention Centre, University Hospital of South Manchester, UK; [3]Centre for Imaging Sciences, Institute of Population Health, University of Manchester, UK; [4]Medical Statistics Department, Education and Research Centre, University Hospital of South Manchester, UK; [5]Centre for Biostatistics, Institute of Population Health, University of Manchester, UK
Breast Cancer Research 2015, **17(Suppl 1):**O2

Introduction: There is little evidence regarding the optimum interval between mammograms in a population breast cancer screening programme. The UK NHS Breast Screening Programme employs a 3-year interval, unlike other countries which screen more frequently. This study uses variations in the screening interval within a single large UK screening service to examine possible relationships between screening interval and screen-detected cancer characteristics.
Methods: A total of 1107 women diagnosed with breast cancer on incident screening over a 5-year period were included. Age, time since last mammogram and surgical histopathology data (tumour type, size, grade, nodal stage, receptor status) were recorded. The Nottingham prognostic index (NPI) was calculated for invasive cancers. Analysis with Spearman's rho and Pearson's correlation was performed.
Results: The median patient age was 63. Most screening intervals were between 800 and 1200 days. The proportion of women with ductal carcinoma in situ (DCIS) decreased significantly with increasing screening interval, from 24/94 (25.5%) for < 2.5 years to 35/240 (14.6%) for ≥3 years ($p = 0.032$). No significant associations were found between other tumour variables and screening interval. The average NPI score was 3.49 with a Pearson correlation coefficient of –0.032 ($p = 0.389$).
Conclusion: The findings suggest that there is a significant rate of progression of DCIS to invasive disease within the current 3-year screening interval. This, together with the rate and characteristics of interval cancers (which were not examined in this study), appears to be more important in determining the optimum screening interval than the characteristics of the invasive cancers detected by screening.

O3

Breast density measurements with ultrasound tomography: a comparison with non-contrast MRI

Elizabeth O'Flynn[1*], Jeremie Fromageau[1], Minty Ledger[1], Alessandro Messa[1], Ashley D'Aquino[1], Minouk Schoemaker[1], Maria Schmidt[1], Neb Duric[1,2], Anthony Swerdlow[1], Jeff Bamber[1]
[1]Insititute of Cancer Research and Royal Marsden Hospital, Sutton, UK; [2]Karmanos Institute, Detroit, MI, USA
Breast Cancer Research 2015, **17(Suppl 1):**O3

Introduction: Ultrasound tomography (UST) is an emerging whole breast 3D imaging technique that obtains quantitative tomograms of speed of sound (as well as other properties) of the entire breast. The measured parameter is the volume averaged speed of sound (VASS) [1,2]. It improves on mammography by measuring density at each voxel and holds promise as a cheap, patient-acceptable, non-ionising radiation method to evaluate

density. This study was to evaluate the technique of UST and compare VASS with percentage water density from non-contrast MRI.
Methods: This single-centre cross-sectional trial had research ethics committee approval. Fifty healthy volunteers from the Generations study [3] (median age 40 years, range 30–64 years) underwent bilateral breast UST. Forty-six underwent MRI using a 2-point Dixon technique [4]. VASS and percentage water density measurements were evaluated in both beasts and compared with Pearson's correlation coefficient.
Results: Mean VASS measurements for the cohort were 1446 ± 148 ms^{-1} (range 1434–1541 ms). There was high similarity between measurements from the right and left breasts (1463 ± 29 ms^{-1}, 1459 ± 29 ms^{-1} respectively ($p = 0.516$)) (ICC = 0.98). Mean percentage water density for the cohort was 34.6 ± 14.5% (range 13.5–74.4%) with good right-to-left consistency (35.7 ± 15.3%, 34.4 ± 14.6% respectively ($p = 0.55$)). There was excellent correlation between VASS and percentage water density ($r^2 = 0.97$, $p < 0.0001$).
Conclusion: UST holds promise as a robust, reliable and accurate technique to evaluate breast density without the use of ionising radiation and has additional benefits of lower cost and greater patient acceptability.
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O4

Breast tumour localisation using Iodine seeds in the UK: the first 100 patients

Nidhi Sibal*, Nerys Forester
Newcastle Teaching Hospitals, Newcastle, UK
Breast Cancer Research 2015, **17(Suppl 1):**O4

Introduction: Wire localization techniques for impalpable breast tumours require wire placement ideally on the day of surgery. Tumour localization using iodine-125 seeds allows tumour localization to occur prior to surgery, improving both work flow dynamics and the patient experience. Newcastle Hospitals Trust is the first centre in the UK to adopt this technique. Here we present our initial experience of the first 100 patients to undergo wire-free surgery.
Methods: From September 2014, data were prospectively collected on all patients undergoing iodine seed tumour localization. Seeds were placed under ultrasound guidance into tumours identifiable on ultrasound between 7 and 14 days preoperatively. Seeds were removed with the tumour after intraoperative localization using a gamma probe.
Results: Our first 100 patients are included in this initial analysis. The majority of patients had a wide local excision, with 10 undergoing therapeutic mastectomy. Thirteen patients returned to theatre for positive margins or completion mastectomy, depending on the final pathology. No seeds were lost during use. One patient had a second tumour identified at the time of seed placement which required wire localization. No radiological complications occurred. Introduction of iodine seeds improved radiological workflow, with creation of a planned outpatient 'seed list', remote from the day of surgery and radiological high demand times.
Conclusion: Iodine seed tumour localization in the UK is achievable, patient friendly and has great benefits for radiologists in terms of department workflow. Noticeably, patients (and surgeons) appear much more relaxed since the introduction of this technique and initial patient satisfaction surveys have been positive.

O5

Is surgical diagnostic excision always necessary for solid lesions with atypia?

Nisha Sharma*, Rebecca Millican-Slater, Eldo Verghese
Leeds Teaching Hospital NHS Trust, Leeds, UK
Breast Cancer Research 2015, **17(Suppl 1):**O5

Introduction: As part of diagnostic work for radiological abnormalities seen in the breast, there has been an increase in use of vacuum-assisted biopsies for diagnosis. This allows more tissue to be sampled and therefore leads to a greater degree of diagnostic accuracy. In addition to diagnosis, in some centres the same procedure has also been used for removal of the entire lesion–vacuum-assisted excision (VAE). This is sometimes offered in place of a diagnostic surgical excision in cases of B3 lesions. We wanted to examine whether VAE can be a safe alternative for B3 lesion that show atypia.
Methods: We identified all patients, at Leeds Teaching Hospital NHS Trust, who had undergone a surgical diagnostic excision following a core biopsy which had revealed the following lesions: fibroadenoma, papilloma or radial scar with atypia (FEA, AIDP or ISLN) during the period between 2009 and 2013. We reviewed the slides of the core biopsy and the subsequent excision biopsy to confirm the histological diagnosis.
Results: Twenty-nine cases in total satisfied our inclusion criteria. There were nine cases of fibroadenomas with ISLN and/or AIDP. None of the cases showed upgrading of the atypia. There were eight cases of radial scar that had either ISLN, LCIS, epithelial atypia or AIDP, of which two showed DCIS in the surgical excision. There were 12 cases of papilloma with either ISLN or AIDP; of these, five had DCIS on surgical excision.
Conclusion: VAE is safe for fibroadenomas with atypia and radial scars with atypia provided the periphery can be adequately sampled, to help diagnose DCIS. Papilloma with atypia requires surgical excision due to complex histological architecture.

O6

Informed choice and consent among women attending for breast screening in the UK: data from a qualitative study

Patsy Whelehan[1,2*], Andrew Evans[1], Gozde Ozakinci[2]
[1]University of Dundee, Dundee, UK; [2]University of St Andrews, St Andrews, UK
Breast Cancer Research 2015, **17(Suppl 1):**O6

Introduction: While the concept of overdiagnosis can be difficult to understand, it has been shown that women wish to be informed about it. The latest breast screening information leaflet offers considerable detail about potential benefits and harms of screening, including overdiagnosis. However, it is unknown how much use women attending for screening make of the leaflet. We report qualitative findings on informed choice and consent within the UK breast screening programme.
Methods: Participants were clients and mammographers from breast screening units in Scotland and London. Semi-structured, in-depth, individual interviews were conducted and thematic analysis performed.
Results: Twenty-two clients were interviewed, aged 50–72: seven first-attenders and 15 subsequent, from a range of deprivation categories. Eighteen mammographer-participants included assistant, registered, and advanced practitioners, with a wide range of ages and lengths of experience. Most clients understood that screening aims to detect breast cancer early to improve the chances of survival. Several were aware of the possibility of false positive results and the risk of mammography inducing a cancer. Others could not name any risks of screening. Women had mostly either skimmed the information leaflet or not read it at all. Several mammographers recounted experiences where women had appeared to attend under pressure from others and where severe challenges existed in ascertaining consent.
Conclusion: These qualitative findings that some women attend for breast screening with little knowledge of the balance of risks and benefits, and in some cases may encounter coercion, require further investigation. New methods of communication may be indicated.

POSTER PRESENTATIONS

P1

Sensitivity of US and FNAC for staging of the axilla in patients presenting with symptomatic breast cancer

Diane Lister*, Miaad Al-Attar, Elizabeth Denton, Lisa Grosvenor, Gayle McDonald, Dave Purnell
Breast Care Centre, UHL NHS Trust, Leicester, UK
Breast Cancer Research 2015, **17(Suppl 1):**P1

Introduction: We investigated our sensitivity for axillary node staging, in patients presenting with symptomatic breast cancer from January to December 2012.
Methods: Of 430 patients identified, 288 had first-line surgical treatment, 63 had neoadjuvant therapy first. Seventy-nine women were unfit for surgery, had less aggressive evaluation of the axilla and were excluded from sensitivity calculations. US axilla ± FNA were performed at presentation. Nodal disease prevalence, sensitivity for diagnosis and the NPV of our tests were calculated. In the neoadjuvant cases, pretreatment nodal status was not accurately known.
Results: The prevalence of nodal metastases in our surgery first cases was 43% (123/288). Twenty-four per cent of cases were micrometastases (29/123). US sensitivity for macrometastases was 51% (48/94); 41% including micrometastases (50/123). FNA sensitivity for macrometastases was 38% (36/94; 35 results C5); 30% (37/123) including micrometastases. Combining all groups, FNA was definitive (C5 or C2) in 90% (134/149) of cases. The NPV of imaging was 65% (137/210); 75% (137/183) with micrometastases excluded. The NPV of a C1/2 result was 72% (28/39) giving a false negative FNA rate of 28%. Of neoadjuvant cases, FNA was positive in 60% (38/63; 35 results C5), giving a minimum disease prevalence and diagnostic sensitivity of 60%. Combining both groups, nodal disease prevalence lies between 46% (161/351) and 53% (186/351). FNA sensitivity is between 48 and 57% for macrometastases (75/157; 75/132); and 40–46% including micrometastases (75/186; 75/161).
Conclusion: Axillary staging depends on both US sensitivity and FNAC technique. US sensitivity is adversely affected by micrometastases. In our symptomatic patients, FNA sensitivity for macrometastases lies between 48 and 57%.

P2

Accuracy of axillary nodal ultrasound and ultrasound fine needle aspiration/ core biopsy in the preoperative staging of patients with invasive breast cancer

William Cheung*, Suzanne McLenachan, Gauripriya Babu, Melanie Smith
Breast Unit, Edinburgh, UK
Breast Cancer Research 2015, **17(Suppl 1):**P2

Introduction: Patients with invasive breast cancer undergo axillary ultrasound ± ultrasound fine needle aspiration (US-FNA)/core biopsy for preoperative staging depending on the ultrasound appearance. At our institution, abnormal axillary lymph node assessment includes: a cortical thickness >3 mm, focal or eccentric cortical thickening, nodal shape (spherical) and replaced appearance with loss of echogenic nodal hilum. Our aims were to evaluate the accuracy of preoperative US + US-FNA/core biopsy for detecting axillary metastatic disease.
Methods: Excluding those patients who underwent neoadjuvant chemotherapy, we identified 120 patients with invasive breast cancer between January and December 2013, which yielded axillary node metastases on final surgical pathology. We performed a retrospective analysis of the clinical records and used descriptive statistics.
Results: Preoperative US correctly identified 60/120 (50%) patients with axillary metastatic disease, 42/60 (70%) had subsequent true positive US biopsies. Of the cases where a biopsy was not performed, 88% (53/60) had one or two positive nodes confirmed after surgery and 12% (7/60) had at least three nodes. Thirty-four of 60 (57%) were from the symptomatic population. Of the total 21 false negative US biopsies from the 18 patients, 81% (17/21) were performed via FNA and 19% (4/21) via core biopsy. Eleven of 18 (61%) were from the symptomatic population. Twenty-nine of 42 (69%) true positive US biopsies were from the symptomatic population.
Conclusion: The results highlight the need for a review of our biopsy criteria, which may result in a decrease in our biopsy threshold. An increase in the use of core biopsies may yield greater accuracy in correctly identifying axillary nodal disease.

P3

Evaluation of the use of microbubbles in the ultrasound assessment of the axilla in breast cancer patients

Nisha Sharma*, Isobel Haigh, Rebecca Millican-Slater, Benjamin Dessauvagie
St James's Hospital, Leeds, UK
Breast Cancer Research 2015, **17(Suppl 1):**P3

Introduction: Contrast-enhanced ultrasound of the axilla can be used to identify the axillary sentinel lymph node. We introduced this into our practice in 2013. During the study period there was an upgrade of our US equipment. The purpose of our audit was to see the negative predictive value of CEUS biopsy of the SLN.
Methods: This was a retrospective audit. In total, 110 patients with invasive breast cancer were identified at the breast MDT. The US core biopsy, surgical sentinel node biopsy and subsequent axillary histology were documented.
Results: CEUS was successful in identifying the first draining lymph node in 88.1% (97/111). Eighty-three of 97 cases (86%) had a definitive biopsy (B2–B5) result with 13 being malignant and 69 were benign. Fifteen were non-diagnostic with B1 core biopsy. The prevalence of axillary metastases at surgery was 31% (30/97) (22 macrometastases, six micrometastases and two isolated tumour cells) of which 42% were detected by CEUS, with 100% specificity. Two of the 30 cases were in palpable, non-sentinel nodes. The negative predictive value of CEUS with core biopsy is 80% but 90% if only macrometastases are included.
Conclusion: CEUS and biopsy is a promising technique for reducing the false negative rate of imaging at the time of SLNB. Our numbers are small and we had a transition to different equipment during the study, but it is felt that reproducible data comparable with Cox et al. [1] is achievable.

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P4

Use of sulphur hexafluoride microbubbles injection to identify the sentinel lymph node in breast cancer patients: initial experience in a UK breast unit

Alice Leaver*, Simon Lowes, Peter Newton, Linsley Lunt, Anuradha Anand, Linda Hutchinson, Sally Athey, Amanda Jane Potterton, Sheetal Sharma, Alan Redman
Gateshead Hospitals NHS Trust, Gateshead, UK
Breast Cancer Research 2015, **17(Suppl 1):**P4

Introduction: In our Trust, all breast cancer patients undergo preoperative axillary staging with ultrasound. Over the past year we have introduced intradermal sulphur hexafluoride microbubbles ultrasound contrast injection to help identify sentinel lymph nodes for a preoperative needle biopsy in each patient. Only patients with malignant node morphology on grey-scale ultrasound undergo biopsy without microbubbles injection.
Methods: Prospective audit of data collated at the time of the microbubbles procedure together with multidisciplinary meeting records identified relevant screening and symptomatic patients with primary breast cancer treatment including axillary node surgery between 1 July 2014 and 1 July 2015. Descriptive statistics were performed.
Results: Sixty-four female patients underwent microbubbles injection and axillary node surgery. Overall combined sensitivity and specificity of microbubbles ultrasound/biopsy procedure were 67% (8/12) and 100% (52/52) respectively. Seventy-five per cent of operative sentinel node biopsies (45/60) showed evidence of previous needle biopsy (four axillary clearance specimens excluded). Needle biopsy detection of micrometastatic disease only, shortly after commencing microbubbles use, led to multidisciplinary meeting consideration of size of needle biopsy metastasis and ultrasound appearance of sentinel and surrounding nodes in triage of patients to type of axillary surgery. Results represent the combined learning curve of seven radiologists. The procedure was well tolerated by patients and technically easy to perform. The greatest challenges were optimising ultrasound machines for microbubbles visualisation, and finding time within busy clinics to perform the procedure.
Conclusion: In this small patient cohort, introduction of microbubbles has facilitated reliable and effective identification of the sentinel lymph node for assessment of morphology on ultrasound and also biopsy.

P5

Preoperative identification and biopsy of sentinel lymph nodes using contrast-enhanced ultrasound: the Tunbridge Wells experience

Tania De'Silva*, Mohamed Hashem, Nick Wakeham, Sarah Kirwan, Neal Chayya, Pippa Mills, Karina Cox
Maidstone and Tunbridge Wells NHS Trust, Tunbridge Wells, UK
Breast Cancer Research 2015, **17(Suppl 1):**P5

Introduction: At Maidstone and Tunbridge Wells NHS Trust, all newly diagnosed breast cancer patients with a normal grey-scale axillary ultrasound have a procedure to identify and biopsy sentinel lymph nodes (SLN) using contrast-enhanced ultrasound (CEUS).
Methods: Retrospective data were collected on patients undergoing a CEUS guided biopsy over a 42-month period at Tunbridge Wells Breast Clinic (TWBC). We compared the results of the first group of patients with the most recent to determine the performance of the test over time.
Results: Between February 2011 and June 2012, 94 patients had a CEUS guided biopsy of SLN. Twenty patients were excluded; five had neoadjuvant therapy, five were unfit for surgery, one had an abnormal grey-scale ultrasound and nine had incomplete data. SLN were visualised in 92% and 83% had a successful SLN core biopsy. The sensitivity of the test to detect SLN metastases was 56%, specificity 100%, negative predictive value 86% and prevalence of lymph node (LN) metastases 27%. Between October 2013 and September 2014, 99 patients had the test. Thirty patients were excluded from the final analysis. SLN were visualised in 86% and 74% had a successful SLN core biopsy. The sensitivity was 69%, specificity 100%, negative predictive value 90% and prevalence of LN metastases 25%.
Conclusion: The percentage of SLN visualised and successfully biopsied in TWBC decreased between the two study periods. These findings may represent a normal fluctuation of the test's performance, be a function of missing data in retrospective collection or the cumulative 'learning-curves' of newly appointed radiologists. This warrants further analysis.

P6

Correlation of post-neoadjuvant chemotherapy response on MRI with final histology in breast cancer patients

Anjum Mahatma*, Lyn Jones, Alexandra Valencia
Breast care centre, North Bristol NHS Trust, Bristol, UK
Breast Cancer Research 2015, **17(Suppl 1):**P6

Introduction: We used MRI breasts to assess neoadjuvant chemotherapy response in line with departmental protocol. The aims were to see the correlation of findings on MRI with final histology in patients with breast cancer receiving neoadjuvant chemotherapy, and to assess the accuracy of our reporting and to evaluate the cause for any discordancy.
Methods: Retrospective data collection from March 2012 to May 2014. Data on 50 consecutive patients, who had both pre and post neoadjuvant MRIs, were collected. Use of CRIS, NBT PACS and UHB PACS for reports and image visualisation. Use of Ultra inquires on the intranet for histopathology reports.
Results: Discrepancy in size of residual tumour between MRI and histology within 10 mm was considered concordant. Concordant size between MR and histology = 31/50 (62%). Discordant size between MR and histology = 19/50 (38%). For complete response: sensitivity = 46%, specificity = 86%, positive predictive value = 71% (95% CI 45–88%), negative predictive value = 70% (95% CI 53–82%), accuracy = 70%.
Conclusion: Good specificity but low sensitivity in line with published literature. The time interval between second MRI and time to surgery did not affect the ability of MRI to predict response. Presence of DCIS and LCIS (42%) influenced MRI-histology discrepancy. Hormonal-positive, Her2-positive and triple-positive were more likely to show size discrepancy compared with other hormone profiles.
Recommendation: We plan to integrate DWI into our reports to increase sensitivity.

P7

Use of preoperative breast MRI to determine disease extent

Nicky Dineen*, Jennifer Weeks, Ruxandra Pietrosanu, Karina Cox, Pippa Mills
Maidstone General Hospital, Maidstone, Kent, UK
Breast Cancer Research 2015, **17(Suppl 1):**P7

Introduction: Breast MRI can be performed in the preoperative workup of patients with biopsy-proven breast cancer to size lesions, if there is discrepancy regarding the extent of disease from clinical, mammography or ultrasound assessment, and to identify multicentric or multifocal disease. The purpose of breast MRI is to plan the optimum surgical procedure, thus reducing the local tumour recurrence rate and the need for the patient to undergo additional surgery.
Methods: In this poster we have reviewed breast MRI examinations from patients with a new diagnosis of breast cancer, who had a preoperative MRI.
Results: There were 75 scans in total. Patients who had MRI occult disease or neoadjuvant chemotherapy were excluded, leaving a total of 51 breast MRI scans. Invasive tumour size and total tumour size (invasive tumour + DCIS) as seen on MRI were compared with the size reported in the surgical pathology specimen. There was accurate correlation in invasive tumour size in 81% and significantly discordant sizing in 19%. Correlation in overall tumour size including DCIS was 70% and significantly discordant in 30%. In three patients in whom the total tumour size was overestimated, the patients consequently had complete local excision with wide excision margins. In another patient, in whom the total disease extent was underestimated on MRI, following complete local excision, repeat surgery was required for positive margins. In these four patients the MRI was misleading for guiding the optimum surgical procedure.
Conclusion: MRI tumour size assessment particularly for DCIS should be interpreted with caution.

P8

MRI evaluation of multifocality and contralateral disease in lobular breast cancer: what can we learn from one region's experience?

Claire Magee[1,2*], Keith Lowry[1]
[1]Belfast City Hospital, Belfast Health and Social Care Trust, Belfast, UK; [2]NIMDTA, Belfast, UK
Breast Cancer Research 2015, **17(Suppl 1):**P8

Introduction: Invasive lobular cancer has been associated with an increased risk of multifocal and contralateral disease. The literature suggests an incidence of contralateral disease as high as 15%. Current national (NICE) recommendations are that all patients with lobular carcinoma being considered for breast-conserving surgery have a preoperative breast MRI. The objective was to identify the rate of additional MRI-detected multifocal and contralateral disease in patients with a newly diagnosed lobular cancer to determine whether it is as high as the literature suggests. Based on our findings we hope to further explore whether another imaging alternative should be considered.
Methods: A retrospective search was done on PACS to identify all those patients in Northern Ireland investigated with bilateral breast MRI for a newly diagnosed cancer during a 15-month period. MRI findings were correlated with histopathology records from all regional labs and the data analysed.
Results: A total of 141 patients had an MRI for biopsy-proven lobular carcinoma. Within this regional cohort the incidence of additional contralateral and multifocal disease was 2.13% and 13.4% respectively.
Conclusions: The incidence of contralateral lobular disease is 2.13%, within our reasonably large study population, significantly less than the currently cited 15%. Our study does show a significant increase in detection of multifocal disease in the same breast by MRI. Based on our results consideration should be given to exploring the use of tomography or contrast-enhanced mammography prior to MRI to attempt to detect further disease. This could potentially expedite patient care.

P9

Use of MRI to predict response following neoadjuvant chemotherapy for breast cancer: how accurately can it guide surgical choice?

Sue Tan*, Simon Lowes, Carol Ellen Holmes, Nidhi Sibal, Lesley McLean, Nerys Forester
Newcastle Teaching Hospitals, Newcastle, UK
Breast Cancer Research 2015, **17(Suppl 1):**P9

Introduction: Breast MRI monitors tumour response to neoadjuvant chemotherapy (NAC) and guides breast-conserving-therapy (BCT). It is unclear how accurately MRI predicts pathological response. This audit investigates concordance between MRI findings and final pathology following NAC.
Methods: Patients undergoing NAC between January 2011 and December 2014 were retrospectively identified. MRI was performed before, during and after NAC. At final MRI, response was graded as radiological complete response (CR no/<5 mm enhancement), partial response (PR <90% original enhancement), or no response (NR <10% reduction in enhancement). After surgery, pathological outcomes were no residual cancer (NRC), <5 mm invasive cancer/DCIS present (PRC), or >5 mm residual invasive cancer (RC). Radiological and pathological responses were either concordant or discordant.
Results: Forty-six patients had NAC over 4 years (mean age 52 years), 43 IDC; three inflammatory carcinoma (not analysed). Radiological CR was seen in 19, PR in 18 and NR in six. Pathological outcome was NRC in 10, PRC in nine, and RC in 24. Responses were concordant in 30/43. BCT was attempted in 22 patients. Three required mastectomy for margins (despite two demonstrating radiological CR). MRI correctly predicted complete pathological response in 7/19 patients. In 12/19 there was residual disease despite MRI appearances. All six patients with no MRI response had residual invasive disease. Three patients with a partial MRI response demonstrated pathological complete response.
Conclusion: MRI during NAC is useful, particularly when the MRI response is PR or NR. However, a complete radiological response predicts a complete pathological response in less than 50% of cases. Patients undergoing BCT following NAC should be aware of the risks of subsequent surgery.

P10

Is pretreatment assessment of the contralateral breast with MRI useful following a new diagnosis of invasive lobular cancer?

Harriet Russell[1,2*], Rebecca Geach[1,2], Iain Lyburn[1,2], Helen Massey[1,2]
[1]Thirlestaine Breast Centre, Cheltenham, Gloucestershire, UK; [2]Cheltenham Imaging Centre, Cheltenham, Gloucestershire, UK
Breast Cancer Research 2015, **17(Suppl 1):**P10

Introduction: There is a reported increased incidence of contralateral disease at presentation of invasive lobular cancer (ILC). In our unit breast MRI is undertaken to assess the extent of all newly diagnosed ILC. If mastectomy is planned MRI is still carried out to assess the contralateral breast–we set out to evaluate this.
Methods: We reviewed 160 reports of consecutive dynamic contrast-enhanced breast MRIs of newly diagnosed ILC (January 2010–June 2015). All cases had been double reported according to the BI-RADS lexicon by two trained readers. We looked at the number of cases of BI-RADS MRM scores of 3 or above in the contralateral breast, second-look ultrasound findings, biopsy rate (U/S or MRI guided) and resultant contralateral cancer detection.
Results: Of the 160 cases, 23 (14.4%) had an indeterminate or suspicious lesion reported in the contralateral breast. Three of these were contralateral cancers that had already been diagnosed by conventional imaging prior to MRI examination. Seventeen (10.6%) had second-look ultrasound of the contralateral breast: 15 lesions were subsequently biopsied in 11 women. Following negative second-look ultrasounds, two women had MRI-guided biopsy. MRI and subsequent work-up identified three women (1.9%) with previously undiagnosed contralateral malignancies. These were a 5 mm invasive ductal cancer, a 16 mm DCIS and a multicentric ILC.
Conclusion: The incidence of 'conventional imaging occult' contralateral disease in ILC may be lower than initially reported. The routine use of MRI to assess the contralateral breast is potentially questionable.

P11

Comparison of MRI and digital breast tomosynthesis in the preoperative evaluation of multifocal breast cancer

Bhavna Batohi*, Valeria Vinci, Clare Peacock, Michael Michell, Asif Iqbal, David Evans, Juliet Morel, Keshthra Satchithananda, Reema Wasan, Rumana Rahim
King's College Hospital, London, UK
Breast Cancer Research 2015, **17(Suppl 1):**P11

Introduction: Preoperative assessment of tumour extent is crucial in the management of breast cancer. MRI is currently indicated in cases of invasive lobular carcinoma on histology, a dense breast parenchymal pattern on 2D digital mammography (2DDM) or if there is a discrepancy between the clinical and radiological extent of disease. We compared the imaging characteristics of multifocal breast cancers on MRI, digital breast tomosynthesis (DBT), ultrasound and 2DDM to demonstrate the accuracy of each modality in the assessment of multifocal cancers.
Methods: A retrospective review of 74 cases over a 4-year period was conducted. We included all cases whereby MRI or DBT identified two or more lesions that were considered suspicious or highly suggestive for malignancy. We compared the sign on MRI (including morphology and enhancement characteristics) against the lesion detectability on DBT. The final histology of these lesions obtained following ultrasound-guided core biopsy, vacuum-assisted MR-guided biopsy or surgical excision was considered.
Results: There were 142 proven malignancies on histology out of the 74 cases, all of which were detected on MRI. The results of the MRI led to a change in surgical management in approximately 50% of cases but overstaged 16% of cases.
Conclusion: MRI is more sensitive than the other three imaging modalities combined in accurately identifying multifocal breast cancer; however, DBT is still a useful adjunct in the evaluation of multifocal disease. There was no correlation between the pathological subtype and the non-detectability of multifocal cancer on the combined imaging modalities.

P12

MRI guided breast biopsy: initial experience of service expansion in West Midlands

Muthyala Sreenivas*, Vandana Gaur
UHCW NHS Trust, Coventry, UK
Breast Cancer Research 2015, **17(Suppl 1):**P12

Introduction: At UHCW Hospitals NHS Trust (which is the sole provider of diagnostic breast MRI for UHCW, South Warwickshire and George Elliot Hospitals NHS Trusts) the MRI guided breast biopsy service has been running since June 2011. Initially, the service was offered to patients imaged at UHCW NHS Trust. With increased experience and confidence the service is now offered to all the eight NHSBSP screening sites in the West Midlands. Here we present our experience regarding the outcomes.
Methods: Since June 2011, 50 cases were referred for MRI guided breast biopsy of which 10 cases were referred from outside the UHCW NHS Trust diagnostic imaging cohort. There were three high-risk screening cases whilst the remaining cases already had diagnosis of cancer but MRI identified further lesions. All cases were graded B3 or above on diagnostic imaging. All images were reviewed (obtained via IEP) and biopsy performed within 10 days of the initial request. Biopsy samples were sent to local hospitals for pathological analysis.
Results: Forty-eight out of 50 cases were considered for biopsy. Two cases were deemed benign (one on review of diagnostic MRI and one case on second-look US). There were 24 malignancies (50 % of all cases). A follow-up

MRI or surgical excision recommendation was made as necessary for non-malignant cases in the biopsy report.
Conclusion: MRI guided breast biopsy has been successfully established at UHCW NHS Trust which currently serves as the regional referral centre in the West Midlands.

P13

Can public consultation effectively optimise the design of a patient information leaflet about breast magnetic resonance imaging?

Lyn Jones*, Anna Mankelow, Joanne Robson, Anjum Mahatma, Alice Pocklington, Alexandra Valencia
Bristol Breast Care Centre at North Bristol NHS Trust, Bristol, UK
Breast Cancer Research 2015, **17(Suppl 1):**P13

Introduction: Breast magnetic resonance imaging (MRI) involves multiple aspects that are unique to a medical environment and may seem frightening and strange to a person from a non-medical background (the tunnel, no credit cards, keys or watches, loud noises, intravenous pump injector). The purpose of an information leaflet is to inform people about what they should expect, and to prepare them for the experience. During public consultation about breast MRI, we discovered that women considered the current information provided by the NHS (from several different hospitals) to be inadequate. They told us that their experience of the process of breast MRI had been more distressing that it would have been had they been better informed. We decided to ask their advice on the design of an information leaflet to see if it could be optimised to better prepare women for the experience.
Methods: Public consultation was used to identify aspects of breast MRI that required explanation in an information leaflet and how they would like the information presented. We incorporated their suggestions into our new design and asked for comments at a second public consultation session.
Results: The need for intravenous access, the tunnel, the nature of the loud noises that changed during the scan and knowledge that the radiographers could see and hear them throughout the scan were all emphasised as requiring explanation. The public suggested the use of multimedia including links to videos, sounds and personal accounts of experience.
Conclusion: Our new leaflet has been approved by the public and patients.

P14

Contrast-enhanced spectral mammography: what is the 'added value' in a symptomatic setting? Initial findings from a UK centre

Sarah Tennant[1*], Eleanor Cornford[1], Jonathan James[1], Helen Burrell[1], Lisa Hamilton[1], Yan Chen[2]
[1]Nottingham University Hospitals NHS Trust, Nottingham, UK; [2]Loughborough University, Leicester, UK
Breast Cancer Research 2015, **17(Suppl 1):**P14

Introduction: Contrast-enhanced spectral mammography (CESM) is a new technology. Dual energy acquisitions during one exposure yield two sets of images: a low energy (LE) set, equivalent to standard full field digital mammography (FFDM); and a recombined set displaying contrast uptake. In our symptomatic breast service, specific patients, including those with a P4/5 clinical abnormality are offered CESM instead of FFDM. Despite encouraging data from Europe and the USA, there are, until now, no UK data to support its use in this setting.
Methods: Retrospective multi-reader review of 50 consecutive patients undergoing CESM. Anonymised LE images were reviewed and given a score for suspicion of malignancy. At least 3 weeks later, the entire examination (LE and recombined images) was reviewed. Pathology data were obtained for all cases. Differences in performance were assessed using receiver-operative characteristic (ROC) analysis. Sensitivity, specificity and lesion size (vs. MRI or histopathology) were analysed using a two-way independent *t* test.
Results: Fifty females, mean age 49. Thirty-four (68 %) patients had biopsy-proven malignancy, 16 (32 %) were benign. CESM was more sensitive than LE alone (94 % vs. 86 %, p <0.025), more specific than LE alone (84 % vs. 63 %, p <0.025) and showed better size estimation (mean size difference 23 % vs. 31 %, p <0.025). ROC analysis showed CESM performance was better than LE alone (AUC 0.933 vs. 0.848, p <0.05).
Conclusion: This preliminary study demonstrates the additional clinical utility of CESM in symptomatic patients. Its potential use in other clinical settings (e.g. screening of high-risk women) requires evaluation.

P15

Comparative study of radiation dose between tomosynthesis and standard compression views in mammography

Alice Bannister*, Julie Scudder
Guys and St Thomas' NHS Foundation Trust, London, UK
Breast Cancer Research 2015, **17(Suppl 1):**P15

Introduction: Objectives were a comparative study of the radiation dose of two-view digital breast tomosynthesis (DBT) and two-view spot compression views in a symptomatic breast service.
Methods: Two hundred patients were included in the study, 100 who had undergone two-view spot compression views and 100 two-view DBT. DBT was carried out using GE Seno Claire with an iso-dose setting and grid system. A retrospective computer-based search of patients in the two categories was undertaken and the accumulative dose for each technique was identified and recorded, as was the thickness of the breast from the original cc mammogram projection. The percentage variance of dose between DBT and spot compression views was calculated according to breast thickness.
Results: The mean accumulative glandular dose for the whole group regardless of breast thickness was 2.84 for DBT compared with 3.50 for spot compression views. In this patient population, the AGD was lower for DBT than for FFDM in 64 % of the patients. When patients were categorized according to breast thickness, the accumulative glandular dose of DBT was on average 22 % less than spot compression mammography with a reduction ranging from 53 to 1 %. There was no evidence in this study that dose reduction with DBT significantly increased with increasing breast thickness.
Conclusion: The radiation dose of patients undergoing two-view DBT on average showed a significant reduction compared to two-view spot compression views. The dose reduction may be attributed to the grid and iso-dose technology used in the selected DBT system.

P16

Positive predictive value of mammographic features on digital breast tomosynthesis

Bhavna Batohi*, Juliet Morel, Reema Wasan, Asif Iqbal, David Evans, Jane Goligher, Michael Michell, Clare Peacock, Rumana Rahim, Keshthra Satchithananda
King's College Hospital, London, UK
Breast Cancer Research 2015, **17(Suppl 1):**P16

Introduction: Digital breast tomosynthesis (DBT) is increasingly used for the further assessment of mammographically detected abnormalities due to its superior specificity compared with 2D digital mammography (2DDM). In this study we evaluate the positive predictive value (PPV) of mammographic features on DBT and assessment categories as per the Royal College of Radiologists (RCR) breast group classification system.
Methods: Women recalled following routine screening mammograms underwent bilateral 2DDM and DBT over an 18-month period. Experienced screening radiologists prospectively evaluated each case, documenting mammographic sign, size and classification according to the RCR breast group guidelines. DBT findings and final pathology were then correlated.
Results: A total of 759 abnormalities were included. On DBT, 221 (29 %) were normal. Of the remaining 538, there were 207 circumscribed masses, 89 spiculate masses, 156 microcalcifications, 35 distortions and 51 asymmetric densities. Final histology revealed 204 malignant and 334 benign lesions. The PPVs were 97.7 % for spiculate masses, 65.7 % for distortions, 35.8 % for microcalcifications, 16.9 % for circumscribed masses and 5.8 % for asymmetric densities.
Conclusion: DBT allows more accurate assessment of mammographic lesions without the impedance of overlying tissues. Spiculate masses have the highest PPV on both 2DDM and DBT. Although the PPV for

asymmetric densities appears relatively low on DBT, this is still nearly twice that of 2DDM. Better understanding of the likelihood of tomographic signs indicating malignancy will increase the value of DBT.

P18

Initial outcome of contrast-enhanced spectral mammography in lesion characterisation in the mammographically dense breast

Zeiad Hussain*, Peter Duggan, Julie Scudder, Sarah McWilliams
Guys and St Thomas NHS Trust, London, UK
Breast Cancer Research 2015, **17(Suppl 1):**P18

Introduction: The accuracy of mammography is limited in the dense breast. Contrast-enhanced spectral mammography (CESM) is a relatively new alternative with promising results. The aim of this study is to assess the sensitivity, specificity, positive predictive value (PPV) and negative predicative value (NPV) of CESM in the detection and characterization of breast lesions.
Methods: Retrospective review of the prospectively maintained database of patients who underwent CESM over a period of 6 months. The sensitivity, specificity, PPV and NPV of CESM were assessed against the histopathology result. In a subgroup of eight patients, the CESM outcome was also compared to MRI scan results. In addition, patients' demographics and correlation with mammography and ultrasound outcomes were obtained.
Results: Twenty-four patients (23 female) underwent CESM over a 6-month period. CESM was found to have a sensitivity of 76 %, specificity of 66 %, PPV of 93 % and NPV of 66 %. The median maximal lesion dimension (MMLD) on CESM was 29 mm. In a subgroup of eight patients MRI was also performed where the MMLD on MRI was 22 mm and on CEM was 20 mm. MRI accurately diagnosed all malignant lesions (8/8) while CEM demonstrated a false negative results in 2/8 patients. In five of the 11 patients who initially had mammography and four of the 19 patients who initially had ultrasound scan demonstrating indeterminate lesions, CEM correctly characterised the lesions.
Conclusion: CESM is a promising and affordable technique in the assessment of suspicious lesions in the mammographically dense breast. CEM has a good sensitivity, specificity, PPV and NPV.

P19

A perceptual aid to delineating the extent of potential mammographic abnormalities

Arul Selvan[1*], Yan Chen[2], Alastair Gale[2]
[1]Sheffield Hallam University, Sheffield, UK; [2]Loughborough University, Loughborough, UK
Breast Cancer Research 2015, **17(Suppl 1):**P19

Poster presentation: Being able to accurately determine the extent of a possible malignancy on a mammogram is an important task as this can affect the potential follow-up surgical treatment that a woman receives after breast screening. It is known that this can be a difficult task, particularly where the lesion has diffuse abnormalities. A potential computer-aided approach is to employ hierarchical clustering-based segmentation (HCS) and this interactive educational exhibit dynamically demonstrates this technique. HCS is an unsupervised segmentation process that when applied to an image yields a hierarchy of segmentations based on image pixel dissimilarities and so can be used to highlight areas in the mammographic image to aid interpretation.
A set of 15 known difficult FFDM mammographic cases were selected from PERFORMS case sets where expert radiologists had previously delineated the extent of various abnormalities. Regions of interest (ROI) around these abnormalities were extracted from the DICOM images and processed using HCS algorithms resulting in a set of paired original mammographic ROI images and related HCS processed ROI images. In the exhibit these paired images are presented and delegates interactively select which of the pair they think best identifies abnormality extent. The original expert delineated abnormality is then provided as feedback. Over the course of the conference, data will be collected on how useful the HCS approach has been found and this information fed back to participants. The learning objectives are to demonstrate the potential of this approach in increasing the perceptual recognition of abnormal appearances.

P20

Diagnostic implications of digital breast tomosynthesis in symptomatic patients

Sanjeeva Ramasundara[1,2*], Lorraine Tucker[1,2], Matthew Wallis[1], Peter Britton[1], Penny Moyle[1], Kethryn Taylor[1], Ruchi Sinnatamby[1,2], Alan Freeman[1], Matthew Gaskarth[1], Fiona Gilbert[1,2]
[1]Cambridge University Hospital, Cambridge, UK; [2]University of Cambridge, UK
Breast Cancer Research 2015, **17(Suppl 1):**P20

Introduction: The purpose of this study was to assess the diagnostic performance/utility of digital breast tomosynthesis (DBT) in symptomatic patients in a multidisciplinary clinical setting.
Methods: The study was registered as a Cambridge University Hospital (CUH) service evaluation audit. Patients from the CUH symptomatic breast clinic from October 2014 to February 2015 were included in the study. Patients were included as clinic workflow permitted and DBT and full field digital mammography (FFDM) (SenoClaire, GE) were interpreted prospectively. Image quality of the DBT and 2D synthetic images were rated on a 5-point scale compared to FFDM. The imaging findings were graded on both FFDM and DBT as normal, benign, indeterminate, suspicious or malignant. Patients were clinically examined and additional ultrasound was carried out as appropriate. FFDM and DBT findings were correlated with the ultrasound findings and when performed to histopathology.
Results: A total of 134 patients were included. Eighty-five per cent of the synthetic images were considered qualitatively similar or better than the FFDM images. Nineteen lesions were graded as indeterminate, 10 lesions were graded as suspicious and six lesions were graded as malignant on FFDM, whereas three lesions were graded as indeterminate, four lesions were graded as suspicious and 14 lesions were graded as malignant on DBT. Seventy-nine per cent of the indeterminate lesions on FFDM were downgraded accurately by DBT and 16 % were upgraded accurately by DBT. There was one false negative and three false positives with FFDM and DBT.
Conclusion: DBT helps characterise indeterminate lesions more accurately compared with FFDM in the symptomatic setting.

P21

A review of BRCA gene carrier demographics in Wales

Tom Evans[1*], Jenny Long[1], Georgina Devenish[1,2], Mike Lewis[3], Damian Bailey[3], Kate Gower Thomas[2,3], Alexandra Murray[1,4]
[1]Cardiff and Vale University Health Board, Cardiff, UK; [2]Breast Test Wales, Cardiff, UK; [3]University of South Wales, Pontypridd, UK; [4]All Wales Genetics Service, Cardiff, UK
Breast Cancer Research 2015, **17(Suppl 1):**P21

Introduction: Women who inherit a mutated copy of the BRCA-1 or BRCA-2 genes have a higher lifetime risk of developing breast cancer. There have been no large epidemiological studies looking at BRCA-positive patients in the UK.
Methods: Across the All Wales Genetics Service, individuals with confirmed BRCA mutation, since formal testing began (1995) to 1 January 2015, were included–identified from a prospectively gathered database. Genetics case notes were obtained and retrospective analysis carried out.
Results: A total of 419 females with mean age 47 (19–81) were included in the study. Of these, 206 were identified using diagnostic testing with the remaining 213 undergoing predictive testing. Of the predictive group who subsequently had cancer, 18 (78 %) developed breast cancer. Seven (39 %) had wide local excision (WLE), six (33 %) had single mastectomy while the remaining five (28 %) had bilateral mastectomies as their primary operation. Five of the predictive group (22 %) had ovarian cancer. Of these, four (80 %) went on to have prophylactic breast surgery too. Of the 13 patients who underwent WLE or single mastectomy, four (31 %) went on to have completion risk reduction mastectomies (RRM). From the remaining 190 individuals in the predictive group with no cancer diagnosis, 102 (54 %) have had no risk reduction surgery,

32 (17 %) RRM only, 31 (16 %) BSO only and 25 (13 %) underwent both procedures.
Conclusion: There is variation in the surgical management of BRCA positive patients in Wales. This has implications for service allocation and demands for screening for these high-risk patients.

P22

Audit of high prevalent breast screening recall rates: Torbay Hospital

Alexander Crowther*, Rebecca Green
Torbay DGH, Torquay, UK
Breast Cancer Research 2015, **17(Suppl 1):**P22

Introduction: The target percentage of women recalled after prevalent round breast screening is <7 % with minimum standards <10 %. Torbay Hospital's prevalent round recall is high at 11.4 %. We plan to assess patterns of recall by category to see if any particular reason for recall could be decreased.
Methods: Retrospective audit of 12 months of prevalent round recalls March 2013-February 2014. All age groups were included. Each recall was grouped into one/more of the following categories: calcification, well-defined mass, ill-defined mass, asymmetric density, distortion, clinical, other. We will calculate the proportion of recalls per group that proved to be malignancy and assess to see if any category was a poor predictor of malignancy. All histology proven malignancies from 2012/13 and 2014/15 will also be categorised by group.
Results: There were 215 recalls for ages 49–69, 15 proven malignancies. 77% of Ill-defined mass, 22% of distortion and 10% of calcifications recalled proved to be malignant and are the strongest predictors of malignancy. Well-defined mass and asymmetric density had 0% malignancy rates and accounted for 129 (59.4 %) of prevalent recalls. Thirteen clinical recalls (1.4 %) were also 0 % for malignancy but beyond the control of the screening service. Further audit was performed looking at the proven malignancies from 2012/13 and 2014/15, which showed a total of 33 malignancies with 13 calcifications, 17 ill-defined masses, one asymmetry, one distortion and one clinical recall.
Conclusion: A high proportion of recalls (60 %) are for well-defined mass and asymmetric density which have poor predictive outcome. These groups are potential areas to decrease recall rates. A total 1.4 % of clinical recalls are beyond the control of the screening service, which would bring prevalent recalls to a compliant level of 10 %.

P23

Outcome of ultrasound of the mammographically normal contralateral breast in patients recalled to the screening assessment clinic

Preet Hamilton*, Simon Lowes, Sheetal Sharma, Alicia Wright, Alice Leaver
Gateshead Hospitals NHS Trust, Gateshead, UK
Breast Cancer Research 2015, **17(Suppl 1):**P23

Introduction: Women diagnosed with breast cancer are at increased risk of contralateral breast cancer; some of these cancers will be synchronous and mammographically occult (M1). Ultrasound may detect M1 breast cancers but also benign lesions that necessitate needle testing, conferring additional patient morbidity that could be termed 'over investigation'. Local guidelines for ultrasound of the M1 contralateral breast vary between units. We present a retrospective audit of contralateral M1 breast ultrasound within our screening assessment clinics.
Methods: Screening and pathology hospital databases of 2013 and 2014 identified records of 331 women with screen-detected breast cancer. Descriptive statistics were performed.
Results: All 331 women underwent ipsilateral breast ultrasound; 288 (87 %) underwent ultrasound of their contralateral mammographically normal (M1) breast. Six contralateral breast lesions were needle sampled: four B2 lesions, two B3 without atypia. No subsequent breast cancer has been detected in any of these patients to date.
Conclusion: Two years of routine contralateral ultrasound has yielded no cancers but also very few benign biopsies. Ongoing audit and discussion of risk/benefit to patients is indicated.

P24

Impact of index of multiple deprivation and ethnicity on breast screening uptake in the North West of England

Jayeshwaraj Bhola[1*], Anil Jain[1,2], Philip Foden[1]
[1]The University of Manchester, UK; [2]The Nightingale Centre and Genesis Prevention Centre, University Hospital of South Manchester NHS Foundation Trust, Manchester, UK
Breast Cancer Research 2015, **17(Suppl 1):**P24

Introduction: The aim was to investigate the impact of index of multiple deprivation (IMD) and ethnicity on breast cancer screening uptake in the North West of England.
Methods: Data for screening uptake rates were collected from 2005 to 2014 using data from the North West Breast Screening Units and the annual breast screening statistics reports. These were correlated with the IMD published in 2007 and 2010. The uptake rates were also correlated with ethnicity data obtained from the Census 2011. Then, the results for ethnicity were adjusted for IMD.
Results: Both prevalent and incident uptake rates have declined from 2005/06 to 2013/14. Deprivation was shown to negatively correlate with breast screening uptake in all rounds, the strongest correlation being with prevalent screening rounds (IMD 2007 $p = 0.005$ and 2010 $p = 0.016$). The incident round negative correlation was IMD 2007 $p = 0.002$ (significant) and IMD 2010 $p = 0.163$ (not significant). For ethnicity, the Caucasian population showed a positive correlation while Asian, a negative correlation. This was more significant in the Pakistani and Bangladeshi groups. Interestingly, when the results were adjusted for deprivation, ethnicity did not show a significant correlation with uptake rates.
Conclusions: Our results clearly show that the more deprived an area, the lower the breast screening uptake rate. Moreover, the higher the proportion of Asian in a population, the lower the uptake rates and this is more significant in the Pakistani and Bangladeshi group compared to the Indian and Chinese. Overall the impact is most marked in the prevalent round.

P25

Does tomosynthesis increase confidence in grading the suspicious appearance of a lesion? An audit of cancers diagnosed in the assessment clinic using tomosynthesis: initial experience at Avon Breast Screening Unit

Gillian Clark*, Alexandra Valencia
Avon Breast Screening Unit, Bristol Breast Care Centre, North Bristol NHS Trust, Bristol, UK
Breast Cancer Research 2015, **17(Suppl 1):**P25

Introduction: Tomosynthesis is a new technology that is being used increasingly to evaluate the breast for assessment in the UK. It has, however, been approved as a screening tool in the United States, Canada and several European countries. We implemented tomosynthesis in the Assessment Clinic at Avon Breast Screening Unit (ABSU) last year as recommended by the NHSBSP. A retrospective audit of 134 consecutive cancers diagnosed from 9 June 2014 to 31 December 2014 was performed. The aim was to evaluate whether tomosynthesis gives additional information to increase the grading of mammographic features of a lesion seen on initial screening mammography and increase the assessor's confidence.
Result: A total of 134 cancers were reviewed. Sixty-six lesions were graded the same on screening mammography and the assessment tomosynthesis. Thirty-six were M5 lesions at screening and assessment. Thirty M3 or M4 lesions remained unchanged. One patient had an M3 lesion that was downgraded. Three patients had incidental cancers found on ultrasound. Sixty-four lesions were upgraded with tomosynthesis. Forty-four of 64 M3 or M4 lesions were upgraded to tomosynthesis 5. Twenty of 64 were upgraded from M3 to tomosynthesis 4. The morphology of the lesions upgraded was spiculated 30/64, 7/64 distortions and 7/64 ill-defined densities. Thirty-one of 44 tomosynthesis 5 lesions measured 10 mm or less.

Conclusion: Tomosynthesis is excellent at showing the spiculate nature of lesions, upgrading the appearance of a lesion from M3 and M4 to tomosynthesis 5 which increases the assessor's confidence during the assessment clinic. It is also excellent in helping identify small suspicious lesions of 10 mm or less. However, ultrasound should always be performed in addition to tomosynthesis as lesions may rarely be downgraded.

P26

An audit of marker placement in stereotactic guided biopsy

Jane Prady[1,2*], Lucy Hill[1,3], Alison Gray[1], Alison Gilchrist[1]
[1]South East of Scotland Breast Screening Service, Edinburgh, UK; [2]Queen Margaret University, Edinburgh, UK; [3]British Society of Breast Radiology, Edinburgh, UK
Breast Cancer Research 2015, **17(Suppl 1):**P26

Introduction: Anecdotal evidence suggests that there is a greater incidence of marker migration using large volume sampling techniques in stereotactic guided breast biopsies.
Methods: Prospective study of 130 biopsies with markers done between June and December 2014. Markers more than 10 mm from the target lesion were considered migrated. The aim of the audit was to quantify the number of markers migrating, distance and direction of migration and conditions under which markers migrate.
Results: A total of 12.3 % had migrated markers: 10.7 % from use of the Bard Encor system and 1.5 % from use of the Bard Vacora system. The greatest marker migration occurred using a latero-medial approach. The majority of migrated markers were deeper than the target lesion. Marker migration was significantly greater using the Encor system within lucent breast tissue. Firstly, further audit is required incorporating lesion size, routine vacuuming of the cavity before deployment of marker, specific sequencing of marker films, correlation of compressed breast thickness and target depth, clinical impact of marker migration and possible development of expanding marker. Secondly, the breast screening service should provide guidelines regarding distances, thresholds and targets for marker migration.
Conclusion: This audit found that marker migration occurred predominantly within lucent breast tissue and using the latero-medial approach when using the Bard Encor system.

P27

Handheld ultrasound-guided 20 mm basket Intact breast lesion excision system biopsy for excision of benign breast lesions

Simon Lowes*, Alice Leaver, Alice Townend, Jackie Westgarth, Peter Newton, Dianne Hemming, Alan Redman
Gateshead Hospitals NHS Trust, Gateshead, UK
Breast Cancer Research 2015, **17(Suppl 1):**P27

Introduction: In selected patients, our Unit has recently moved from handheld ultrasound-guided vacuum-assisted core biopsy (VACB) piecemeal acquisition of tissue to the handheld Intact Breast Lesion Excision System (Intact). Intact removes a single piece of tissue, potentially allowing radiologists to excise the entire lesion as well as allowing pathologists to visualise lesion architecture more easily and to calculate margins. We evaluated our early experience of excising benign or likely benign breast lesions using the 20 mm Intact.
Methods: Prospective data collection was performed on all patients undergoing handheld ultrasound-guided Intact excision under local anaesthetic in 2014 and 2015, which comprised 19 lesions in 18 female patients aged 29–73.
Results: The device was technically straightforward to operate and well-tolerated by patients with no significant complications. Handheld needle orientation was difficult within dense glandular tissue (only one acquisition is possible per needle), but improved with increased operator experience. Achieving adequate analgesia required higher quantities of local anaesthetic than for the equivalent VACB. Pathologists found specimens easier to interpret than VACB samples. In all cases adequate excision was completed sonographically at one outpatient appointment, but in six cases a second Intact biopsy and/or a VACB was required to complete that excision, with extra cost implications. In two patients with M3 microcalcification the Intact pathology demonstrated ductal carcinoma in situ, leading to surgical wide local excision.
Conclusion: Our early experience shows Intact as a reliable and effective tool for handheld diagnostic and/or therapeutic excision of selected breast lesions.

P28

The 3.5-year to 13.5-year follow up of 137 lesions of uncertain malignant potential (B3 lesions) diagnosed by vacuum-assisted biopsy alone

Karen Mullin*, Anne Turnbull, Sharma Puri, Mark Bagnall
Royal Derby Hospital, Derby, UK
Breast Cancer Research 2015, **17(Suppl 1):**P28

Introduction: Vacuum-assisted biopsy (VAB) was introduced in Derby in 2001, as the second procedure after 14g core biopsy. We present 3.5-year to 13.5-year follow up of cases where B3 lesions have been managed with VAB alone.
Methods: The NBSS and local BASO databases were searched from January 2002 to December 2011 for all cases with B3 histopathology, a VAB procedure and no surgery. Screening and symptomatic women were included.
Results: There were 137 women who met the criteria. The pathologies found are presented in Table 1. The cases where atypia was found were individually discussed at MDT to ensure that the abnormal feature had either been excised or very well sampled. Only one breast cancer has developed at the same site in a woman who had 5 mm calcification excised at VAB. This lobular cancer was identified 4 years later at recall from annual surveillance. Five other cancers have developed in the 137 cases, one contralaterally and four different lesions in different sites in the same breast.
Conclusion: This study provides further evidence for the safety of the use of VAB alone in the diagnosis of B3 lesions in the longer term.

P29

Quantitative study: should vacuum-assisted biopsy be the first biopsy approach in breast interventional techniques in stereotactic guided microcalcifications rather than 14 gauge core needle biopsy?

Anuma Shrestha*, Louise Wilkinson, Rosalind Given-Wilson, Judi Curtis
St George's Healthcare NHS Trust, London, UK
Breast Cancer Research 2015, **17(Suppl 1):**P29

Introduction: Stereotactic guided 14 gauge core needle biopsy (14GCNB) and vacuum-assisted biopsy (VAB) are the two commonly used biopsy methods for obtaining an accurate diagnosis for microcalcifications.

Table 1(abstract bcr3790)

Pathology	Initial biopsy	Final pathology
CSL	39	37
Papillary lesion, no atypia	51	50
Papillary lesion, atypia	2	0
CCC atypia/flat epithelial atypia	12	0
ADH/apocrine atypia/AIDEP	9	1
Lobular neoplasia	6	5
Mucocoele-like lesion	5	0
Other B3 atypia	5	0
Fibroepithelial lesion	2	0
B2	4	40
Fibroadenoma	0	3
B1	2	0
VAB only	0	1
Total	137	137

Retrospective review of 399 patients who underwent biopsy for breast microcalcification during screening assessment from April 2012 to March 2013 was used to evaluate the performance and cost-effectiveness of both methods.
Methods: The repeat biopsy rate, diagnostic accuracy, time taken and cost of both methods was calculated. Microsoft Excel (2010) and SPSS 22 were used for statistical analysis.
Results: The repeat biopsy rate for 14GCNB was 10 % and VAB was 6 %. Specificity, PPV and NPV were all 90 % or higher when compared against post-surgical final diagnosis in both methods. The sensitivity of VAB was 93.75 % vs. 71.88 % for 14GCNB for first biopsy. There was no significant difference in procedure time between two methods (p = 0.291). VAB necessitated almost double the rate of clip deployment compared with 14GCNB. The cost of VAB would be £69,922 greater than 14GCNB if used as the first-line biopsy method in this series.
Conclusion: This study found VAB to have higher sensitivity than 14GCNB. There was also a trend for lower repeat biopsy rate, higher diagnostic accuracy and lower surgical upgrade with VAB. If VAB had been used as the first biopsy method for microcalcifications, the cost would have been significantly higher. 14GCNB is a cost-effective but less sensitive first biopsy method for selected microcalcifications.

P30

Safety of vacuum-assisted biopsy/mammatome guided, non-operative management of B3 lesions without atypia: a 7-year follow-up study

Alex Wilkins[1,2*], Peter Kneeshaw[1], Penelope McManus[1], Kartikae Grover[1], Caroline Bradley[1], Ayesha Rahman[1], Anne Hubbard[1]
[1]Castle Hill Hospital, Cottingham, UK; [2]Hull York Medical School, Hull, UK
Breast Cancer Research 2015, **17(Suppl 1):**P30

Introduction: B3 management balances safe treatment of potential malignancy against the morbidity of surgical excision of benign lesions. Vacuum-assisted biopsy (VAB) increases diagnostic accuracy, removing some lesions entirely without surgery. Few follow-up data are available to assess the safety and effectiveness of this approach.
Methods: A total of 215 patients with B3 biopsies without atypia were identified using Labcentre histopathology codes at a single centre. Hospital and NBSS records were analysed to identify patients who were treated with VAB and mammographic surveillance alone and to determine outcome over a follow-up period of 52–149 months (median 85). Local Labcentre and regional Pathlinks histopathology records were independently checked. Mammograms of ipsilateral re-presentations were reviewed by a consultant radiographer and consultant radiologist to determine whether lesions developed at the site of B3 biopsy.
Results: Twenty per cent had excision biopsy (42/215) of which <5 % (2/42) contained carcinoma. A total of 144 patients had VAB which identified 30 high-risk cases analysed separately (DCIS, B4 or atypia). In total, 114 B3 lesions without atypia (on either core biopsy or VAB) were followed mammographically after VAB with no surgical intervention. Four patients re-presented to the service with malignancy; 37, 38, 41 and 67 months after VAB. Sixty-one per cent (69/114) of individuals were screened locally 2012–2015.
Conclusion: VAB of B3 biopsies without atypia appears to be safe with no representations in the first 3 years and overall carcinoma and DCIS incidence of 3.5 % over 7 years (4/114). National guidance on B3 lesion management is required.

P31

Safety of vacuum-assisted biopsy/mammatome guided, non-operative management of B3 lesions with atypia: a 7-year follow-up study

Alex Wilkins[1,2*], Peter Kneeshaw[1], Penelope McManus[1], Kartikae Grover[1], Caroline Bradley[1], Ayesha Rahman[1], Anne Hubbard[1]
[1]Castle Hill Hospital, Cottingham, UK; [2]Hull and East Yorkshire Medical School, Hull, UK
Breast Cancer Research 2015, **17(Suppl 1):**P31

Introduction: B3 management balances safe treatment of potential malignancy against the morbidity of surgical excision of benign lesions. Vacuum-assisted biopsy (VAB) increases diagnostic accuracy, removing some lesions entirely without surgery. Few follow-up data are available to assess the safety and effectiveness of this approach.
Methods: A total of 129 patients with B3 VAB with atypia were identified using Labcentre histopathology codes at a single centre. Hospital and NBSS records were analysed to identify patients treated with VAB and mammographic surveillance alone and to determine outcome over a follow-up period of 52–142 months (median 85).
Results: Ten per cent progressed directly to surgery (13/129). A total of 116 were followed mammographically after VAB with no surgical intervention (49 ADH, 2 ALH, 21 LCIS, 44 atypia (not otherwise specified)). Nine patients re-presented to the service with invasive carcinoma (six ipsilateral) and two with DCIS (both ipsilateral) between 12 and 80 months. The ipsilateral re-presentation rate was highest for ADH (5/49) and LCIS (2/21). In the absence of ADH or LCIS, the only ipsilateral representation was one low-grade DCIS, 62 months after VAB.
Conclusion: Re-presentation with ipsilateral carcinoma following VAB excision for ADH and LCIS is comparable to surgical excision for ADH and LCIS. National guidance is required.

P32

Use of WHO checklist in interventional breast radiological procedures

Trupti Kulkarni[1,2*], Andrew O'Connor[1]
[1]University Hospital Aintree, Liverpool, UK; [2]Clatterbridge Breast Unit, Wirral, UK
Breast Cancer Research 2015, **17(Suppl 1):**P32

Introduction: Increasing awareness of safety in healthcare provision has resulted in incorporation of risk-reducing strategies. The WHO checklist is now increasingly being used by interventional radiology. Is it relevant for the interventional breast radiologist?
Methods: A questionnaire for assessing awareness and use of the WHO checklist used for surgical procedures (or a modified checklist) was devised. Responses were collected and analysed via Survey Monkey.
Results: Eighty-one complete responses were received and analysed. In total, 93.83 % were aware of the WHO checklist; 83.95 % worked in departments where this was used by IR; and 46.91 % used the checklist individually or as a department. The list was locally devised in 43.21 %. Of those who did not employ use of the list, 27.16 % had considered its use. A total of 24.69 % had never considered using it. Fifty-four per cent opined it was relevant to a therapeutic vacuum-assisted procedure with various individual procedures having scores ranging from 12 to 47 %. Adherence to CQC standards was cited as the reason for use of the checklist. Naysayers quoted increase in time required and poor work flow as reasons for not using it.
Conclusion: Breast radiological intervention procedures, although low risk and with low complications, remain health interventions. An adverse event should not be a necessary trigger for change of practise. Opinion on use of additional safeguards such as an intervention checklist, while divided, suggested that a modified checklist is called for in complex procedures involving recall of patient at a different date, multiple radiologists involved and therapeutic procedures under vacuum guidance.

P33

Breast biopsy in patients on anti-coagulants: is new guidance needed?

Trupti Kulkarni[1,2*], Andrew O'Connor[1]
[1]University Hospital Aintree, Liverpool, UK; [2]Clatterbridge Breast Unit, Wirral, UK
Breast Cancer Research 2015, **17(Suppl 1):**P33

Introduction: Patients on anti-coagulation requiring breast biopsies are more at risk of bleeding. Newer anti-coagulants may not have a method for quantifying coagulation unlike the INR for warfarin. Also, some of these such as dabigatran do not have antidotes and rely on the body's ability to excrete the drug which may be altered by renal function. There are no up-to-date national guidelines on breast biopsy in such patients.
Methods: A questionnaire for assessing practise of breast biopsy in patients on various anti-coagulants was devised. Responses were collected and analysed via Survey Monkey.
Results: Seventy-eight complete responses were received and analysed. Thirty-eight per cent of respondents said they had local guidelines while

45 % used BSBR guidelines 2012. Sixty-three per cent would refer back to the GP/specialist in cases of warfarinised patients,14 % in cases of patients on clopidogrel and only 1 % of those on aspirin. Eighty-eight per cent of respondents did not have a policy for dabigatran and rivaroxaban. Practise was different in screening and symptomatic groups in 7 % due to the site of screening units away from A/E. Unit policy in warfarinised patients requiring vacuum-assisted biopsy (VAB) was not available to 38 %. Anecdotally, a number of radiologists reported that they would not perform VAB in patients on clopidogrel.
Conclusion: There is a wide variation in practise while performing biopsies in patients on anti-coagulation including the newer anti-coagulants.

P34

Role of mammographic templates in managing ever increasing workloads

Anne Nielsen Moody*, Maggie Fletcher, Nisha Sharma
Leeds Teaching Hospitals NHS Trust, Leeds, UK
Breast Cancer Research 2015, **17(Suppl 1):**P34

Introduction: A breast imaging report is a key component of the breast cancer diagnostic process. The report must be clear and concise to avoid ambiguity and confusion. However, substantial variation in the information provided in a breast imaging report is not uncommon to see. We sought to develop a report template containing a summary of all essential information pertinent to the surgeons and the radiologists.
Methods: Breast surgeons and radiologists were consulted as to what was required in a report and they stated breast density, correlation with clinical findings, lesion characteristics, R1–R5 category, site and size of lesion, and is clinical area of concern biopsied. A retrospective audit of 30 breast imaging reports of recently diagnosed carcinomas between October 2014 and January 2015 were reviewed to see if these were recorded.
Results: Ten per cent of reports did not mention breast density. The most frequent information provided is lesion size (ultrasound 100 %, mammography 73 %). Correlation with referral was unclear in 10 %, R1–R5 category not given in 3 %. Site of lesion was not provided in 3 %. Seven per cent of the reports were 3–4 pages long, described as confusing and difficult to read by the two data extractors. Thirty per cent of reports were not separated into mammography/ultrasound/biopsy sections. There were 23 different ways of characterising lesions on mammography and 24 on ultrasound.
Conclusion: The audit highlighted the need for a breast reporting template that met the needs of the clinicians to ensure the relevant facts were included to further improve the patient pathway.

P35

Local experience of referral for breast assessment resulting from incidental findings on CT and PET-CT studies over a 5-year period

Richard Sidebottom*, Jean Lee, Shaheel Bhuva, Vaishali Parulekar
Oxford Breast Imaging Centre, Oxford University Hospitals NHS Trust, Oxford, UK
Breast Cancer Research 2015, **17(Suppl 1):**P35

Introduction: Incidental findings of breast abnormalities from cross-sectional imaging (CT and PET-CT) are a relatively common source of referral for breast assessment at our unit. We sought to describe and quantify our local experience of these referrals and to determine which cross-sectional imaging findings were more predictive of malignancy.
Methods: Retrospective review using radiology information system searches for mammography referrals resulting from CT and PET-CT scan findings performed over a 5-year period (July 2010–July 2015) in Oxford University Hospitals NHS Trust. Studies in patients with known active breast malignancy were excluded. Cross-sectional imaging characteristics of the abnormalities were collected including CT enhancement, PET avidity, size and shape. Assessment imaging features, subsequent biopsy and clinical outcomes were recorded.
Results: A total of 126 patients were assessed as a result of incidental breast abnormalities. Thirty-six of 126 (29 %) were subsequently found to have breast malignancy (CT 28/110, 25 % and PET CT 8/16, 50 %). Size, shape and CT enhancement features will be presented. Lesions with high avidity on PET-CT scans were more likely to be primary breast cancer on biopsy (83 % SUVmax >2.5). Of 36 breast malignancies identified, three patients underwent mastectomy surgery, 10 had wide local excision and 20 had non-surgical management. Three patient outcomes are unknown at the time of writing.
Conclusion: Referrals arising from incidental abnormalities identified on cross-sectional imaging have a high yield for breast malignancy (29 %). Incidental PET findings, while less often a route of referral, have the highest likelihood of identifying a malignant lesion.

P36

Do bone scans add to CT in detecting skeletal metastases in breast cancer staging?

Anuradha Anand[1*], Lekha Potti[2], Geoff Naisby[1], Sheetal Sharma[2], Alan Redman[2]
[1]James Cook University Hospital, Middlesbrough, UK; [2]Queen Elizabeth Hospital, Gateshead, UK
Breast Cancer Research 2015, **17(Suppl 1):**P36

Introduction: Recent studies have questioned the value of bone scans (BS) in staging breast cancer when a CT chest, abdomen and pelvis is also performed. We retrospectively reviewed breast cancer staging CTs and BS performed within 2 months of each other, to see if BS identified more skeletal metastases than CT.
Methods: Our study was performed at the breast screening unit at Queen Elizabeth Hospital, Gateshead (QE) and the symptomatic breast unit at James Cook University Hospital (JCUH), Middlesbrough. Experienced radiologists blinded to primary BS reports retrospectively assessed CTs performed for primary breast cancer, known recurrence or to explain symptoms of pain. They then reviewed the same patient's BS. CT and BS were marked positive, negative or indeterminate for skeletal metastases.
Results: Combined data from both units yielded 253 cases in total. CT and BS concurred in 217 cases. Of the remaining 36, CT identified skeletal metastases in five where BS was negative and two where BS was indeterminate. CT excluded metastases in 23 which were indeterminate on BS. BS confirmed or excluded metastases in five cases where CT was indeterminate and identified metastases in only one case which was negative on CT. This lesion proved to be benign and hence BS was false positive in this case.
Conclusion: BS does not detect more skeletal deposits than CT in the initial assessment or follow-up of breast cancer. CT should be used as the first-line investigation for skeletal and visceral metastasis and BS reserved for problem-solving.

P37

A comparative study of pathological and prognostic differences in DCIS between Asian and Caucasian women

Raeesa Patel[1*], Anil Jain[1,2], Philip Foden[1]
[1]The University of Manchester, UK; [2]The Nightingale Centre and Genesis Prevention Centre, Manchester, UK
Breast Cancer Research 2015, **17(Suppl 1):**P37

Introduction: The aim was to compare the histopathological and prognostic differences in DCIS between age-matched Asian and Caucasian female patients.
Methods: Data related to presentation, histopathology, prognosis and treatment of DCIS were gathered from 48 women from the Asian Breast Cancer Database at the Nightingale Centre, all of whom had begun with an initial diagnosis (at biopsy) of DCIS. These were compared with age-matched Caucasian patients, also diagnosed with DCIS at the time of biopsy. The total study included 96 patients.
Results: Out of 48 Asian women more presented symptomatically (25, 52.1 %) compared to Caucasian women (13, 27.1 %), $p = 0.012$. Asian women had a larger mean value in regards to tumour size (28.48 mm) compared to Caucasian women (21.59 mm), and more progressed from an initial diagnosis of DCIS, to a final diagnosis of DCIS with an invasive component (12.5 % compared to 2.1 %), $p = 0.05$. However, differences in the average Van Nuys Prognostic Index score were not statistically

significant in Asian (7.13) and Caucasian (7.51) patients, $p = 0.236$. Interestingly, significantly more Asian women were treated with mastectomy (47.9 %) compared to Caucasian women (22.9 %), $p = 0.015$.
Conclusion: Asian women presented with a larger tumour size, more progressed to a diagnosis of invasive carcinoma, and more had mastectomies compared to Caucasian women. Since fewer Asian women are presenting via the screening programme, education and awareness of breast cancer and screening needs to be increased in Asian women to increase their screening uptake rates.

P38

Comparison of prognostic indices in symptomatic and screen-detected invasive breast cancer in Asian and Caucasian women

Andrew Steele[1*], Anil Jain[1,2], Navneet Randhawa[1], Philip Foden[1], Julie Morris[1]
[1]The University of Manchester, UK; [2]The Nightingale Centre and Genesis Prevention Centre, Manchester, UK
Breast Cancer Research 2015, **17(Suppl 1):**P38

Introduction: In the UK, ethnic minority groups have reported lower awareness of breast screening and have presented with breast cancer symptoms later than Caucasian women. Our study compared prognostic indices in symptomatic and screen-detected breast cancer between Asian and Caucasian patients.
Methods: Of the 310 Asian women diagnosed with breast cancer between 1999 and 2014 in the Asian Breast Cancer Database, 217 with invasive cancer were selected (57 screen-detected and 160 symptomatic). Data on invasive tumour size, grade, lymph node status and NPI were compared with age and mode-matched Caucasian breast cancer patients.
Results: Asian symptomatic women had larger invasive tumours (median 25.0 mm, IQR 17.1–35.8 mm), compared with Caucasian patients (median 17.0 mm, IQR 12.0–26.4 mm) (p <0.001); higher proportions of grade 3 tumours (64.4 %) ($p = 0.007$) and with more than one lymph node involved (46.2 %) ($p = 0.004$), compared with Caucasian patients (48.8 % and 30.0 % respectively); worse NPI scores (median 4.6, IQR 4.3–5.6), compared with Caucasian patients (median 4.3, IQR 3.3–4.7) (p <0.001); and higher proportions with poor prognosis (33.8 %), compared with Caucasian patients (11.9 %) (p <0.001). Multivariable analysis showed invasive grade and tumour size were statistically significant independent discriminators with lymph node status as borderline significant. However, there was no statistically significant difference between the ethnic groups for screen-detected invasive tumours.
Conclusion: Prognostic indices in Asian women were worse in symptomatic breast cancer, but similar in screen-detected invasive cancer, compared with age-matched Caucasian women. Greater initiatives need to be implemented to promote breast cancer awareness, education and screening among the Asian ethnic minorities.

P39

Prospective study looking at CT staging for metastases in early breast cancer

Michelle McMahon[*], Nisha Sharma, David Dodwell
The Leeds Teaching Hospitals, NHS Trust, Leeds, UK
Breast Cancer Research 2015, **17(Suppl 1):**P39

Introduction: Practice is variable nationally with no agreed guidelines for performing CT staging of asymptomatic patients with a new diagnosis of breast cancer. We have devised a new proforma for performing staging CT in asymptomatic women with high-risk early breast cancer. In our unit, 600 cancers are diagnosed/year.
Methods: Prospective audit identifying patients eligible for CT staging based on our proforma over a 12-month period were identified at the breast cancer MDT. A staging scan of the chest, abdomen and pelvis was performed. CT results and clinic letters were reviewed. Criteria: asymptomatic patients diagnosed with new breast cancer requiring staging (T4, inflammatory breast cancer or tumour which extends into the chest wall, skin, or both, fixed nodal disease, arm oedema, nodal disease in SCF; T3, tumour >50 mm clinically, radiologically or pathologically; ≥4 positive nodes at surgery; part of clinical trial involvement or extensive residual disease at surgery after NACT).
Results: Forty patients were referred for a CT staging, four patients did not proceed. Indications: 26 (65 %) had four or more metastatic nodes, six (15 %) T3, eight (20 %) T4. 20/36 (56 %) had no evidence of metastatic disease; 8/36 (22 %) had definite metastases identified (four, >4 nodes, three T4 and one T3); 8/36 (22 %) had indeterminate findings. In three cases the diagnosis of metastatic disease contributed to the decision not to proceed with surgery. No negative impact on treatment was reported in the indeterminate cases.
Conclusion: The new proforma for guiding staging CT scans has reduced the number of overall scans performed with a relatively high pick-up rate of 22 %.

P40

Breast pain in the over 40s: impact on imaging

Trupti Kulkarni[*], Andrew O'Connor
Aintree University Hospital, Liverpool, UK
Breast Cancer Research 2015, **17(Suppl 1):**P40

Introduction: Current practice in our unit as agreed with the local Cancer Network Group is for women over 40 years presenting with breast pain and with a normal clinical examination to have a mammogram. NICE recommends no imaging in this group of patients. The aim was to measure workload impact from current practice, and assess diagnostic yield.
Methods: Retrospective audit of imaging and biopsy in female patients over 40 years, presenting with breast pain, and who had normal clinical examination.
Results: A total of 100 patients, aged 40–65, from 30 clinics over 3 months, 2014. Eighty normal mammograms. Seven of these had ultrasound for focal tenderness or probable glandular tissue, all of which were normal. Twenty abnormal mammograms: eight calcifications, six asymmetry, five discrete masses, one implant rupture. Total imaging workload: nine requests for previous imaging from elsewhere, eight further mammographic views, 11 ultrasounds, two stereo core biopsies (benign), one ultrasound-guided FNA followed by core biopsy (malignant). Yield: one cancer (25 mm grade 2 invasive ductal, negative sentinel lymph node).
Conclusion: Workload is appreciably impacted by breast pain investigations. The final diagnosis was often delayed because of the wait for pathology results and previous imaging, increasing patient anxiety. The cancer detection rate number is too low for significance, but nevertheless compares favourably to screening. After discussion with clinicians it was decided to keep to our current practice as a means of opportunistic screening, particularly as our unit is in an area of poor screening uptake.

P41

Breast cancer in women under 35 years

Kate Hunter[*], Deirdre Boyle, John Kavanagh, Yvonne Hanhauser, Elizabeth Connolly, Sylvia O'Keeffe
St James's Hospital, Dublin, Ireland
Breast Cancer Research 2015, **17(Suppl 1):**P41

Introduction: Breast cancer is rare in young women under 35 years; however, it can present a diagnostic challenge. This study was undertaken to determine the presentation of breast cancer in young women and the role of imaging including the predictive value in determining tumour size.
Methods: All breast cancer diagnoses in women aged ≤35 years from 2006 to 2014 were identified. Data were then extracted from PACS and EPR. Analysis was performed on Microsoft Excel. Paired *t* tests were used to assess the accuracy of imaging in predicting final pathological tumour size.
Results: Seventy patients with 74 presentations of carcinoma were included. Mean age 31 years (SD = 3.7). Of 73 examination scores (E): 7 % (5/73) were screen detected, 52 % (38/73) were E2–3 and 38 % (28/73) were suspected (E4–5). At ultrasound, 16 % (12/74) were U3 and 82 % (61/74) were suspected to be malignant (U4–5). Seventy-four per cent (51/69) had a mammogram score M4–M5. Seventy-five per cent (50/67)

of patients were ACR density of 3–4. At MRI (42/70), tumour size correlated with final tumour size on pathology (N = 24, Pearson R 0.45). There was no significant difference between MR estimates of size and final tumour size (t = −0.88, p = 0.39). In contrast, there was a significant difference between US size estimates and final pathology (N = 43, t = −2.56, p <0.05).
Conclusion: Clinical examination has a low PPV in young women with ultrasound demonstrating a superior performance. However, 16 % of cancers were unsuspected at ultrasound. An important finding is the usefulness of MR in defining tumour size, suggesting it should be performed in all young patients.

P42

'Peace of mind'? Demand for breast imaging investigation following normal clinical examination: establishing the patient benefits and service implications for a symptomatic service

Miaad Al-Attar*, Lubna Bashir, Lisa Grosvenor, Diane Lister, Elizabeth Denton, Moin Hoosein, Lakshmi Sundaram, Gayle McDonald, Niki Hartley
Breast Care Centre, Glenfield Hospital, UHL, Leicester, UK
Breast Cancer Research 2015, **17(Suppl 1):**P42

Introduction: In the symptomatic service, we noted that requests for imaging after normal examination appeared to be significantly increasing but not improving cancer detection. We aimed to identify demand for imaging following normal clinical examination and their incidence of cancer.
Methods: Our unit underwent clinic reorganisation, with the consultant surgeon as primary clinical assessor in February 2014. We carried out a retrospective audit, choosing a month prior and post service reorganisation. All patients referred to imaging with normal clinical examination (P = 1) were included. We recorded demographics, presenting complaint, requestor, findings and biopsies outcomes.
Results: Pre consultant involvement, 576 patients were seen and 175 referred with P = 1 (30 %). A total of five biopsies (3 % of referred) were performed retrieving two malignancies (1 % of referred). Post reorganisation, 771 patients were seen and 308 referred to imaging with P = 1 (40 %). A total of 32 biopsies were performed (10 % of referred) with three malignancies (<1 % of referred). In this group only one patient was <40 years old. All cancers were invasive ductal (B5b). All malignancies were in areas of presenting concern. There was a significant increase in workload with decreasing sensitivity of radiology and clinical examination post reorganisation. The background incidence of malignancy was low and stable.
Conclusion: There is increasing demand on imaging for patients with normal clinical examination unrelated to clinical seniority. Cancers are present even with normal clinical examination and patient's initial clinical concern proved to be an important predictor. Careful scrutiny of the patient's presenting symptom may allow detection of all cancers.

P43

The radiologist in the fast track breast clinic: the invisible man (woman)

Nicholas Ridley[1*], Charlotte Jones[2], Nathan Coombs[2], Sarah Taylor[1]
[1]Breast Unit, Great Western Hospital, Swindon, UK; [2]Department of Surgery, Great Western Hospital, Swindon, UK
Breast Cancer Research 2015, **17(Suppl 1):**P43

Introduction: During a visit to radiology a GP expressed surprise when she discovered that all the breast imaging and biopsies were done by radiologists. She assumed these were done by the surgical team. This led us to review the surgical letters to GPs to see if the radiologist's contribution was acknowledged.
Methods: We reviewed 20 surgical letters from the initial fast-track appointment to GPs about patients with a proven cancer. All imaging and biopsies were performed by a consultant radiologist or radiographer.
Results: Seventeen (85 %) letters were written by a consultant breast surgeon and three (15 %) by breast registrars. Only one (5 %) letter mentioned radiological involvement and two described the biopsies as 'we performed' giving the impression that the biopsy had been performed by the surgical team. In 17 the description of the imaging and biopsy was neutral.
All of the letters, however, were judged to be excellent in terms of information to the GP.
Conclusion: Many medical professionals outside of the breast team are unaware of the role of the radiologist. The radiologist, despite doing all the imaging and biopsies in our clinic (which is the case in many units around the country), was essentially invisible in 19 of 20 of the letters we reviewed. We need to debate how we promote the contribution of the radiologist. This could be by reviewing the GP letter template with our surgical colleagues or by promoting the role of radiology to GPs, clinicians, medical students and the general public.

P44

Follow-up imaging of breast symptomatic patients: a waste of radiologist time?

Diana Dalgliesh*, Alison Smith, Anjum Mahatma
Royal United Hospital, Bath, UK
Breast Cancer Research 2015, **17(Suppl 1):**P44

Introduction: The NHSBSP does not recommend early recall following assessment of screen-detected abnormalities. Symptomatic patients in our breast clinic may be invited to return for repeat imaging. A survey of repeat imaging in our symptomatic breast clinic was undertaken to understand whether we can justify reducing the number of patients recalled and to gauge associated anxiety levels.
Methods: We identified 71 consecutive patients attending an imaging appointment from 1 February 2013 who had a repeat imaging recommendation. Patients were asked to complete a questionnaire. We recorded reason for recall, imaging interval, imaging outcome, and feedback from questionnaires.
Results: One patient did not attend. Mean interval between initial and repeat imaging: 4–16 weeks. Fifty-five episodes classified R1/R2 at initial imaging; 11 R3; four R4. Outcomes: 68 % were discharged; 11 % were invited for a third imaging appointment and all were then discharged; 13 % had a benign biopsy; 7 % returned to the surgical clinic for management of their benign symptom. Twenty-three questionnaires were completed – one patient was 'very anxious' about repeat imaging, seven patients were 'mildly anxious', 10 were 'relieved', six were 'not bothered'.
Conclusion: Repeat imaging did not yield any diagnoses of malignancy. All patients were eventually discharged with a benign outcome. We can justify reducing follow-up imaging of our symptomatic patients in line with guidelines for screening assessments. Radiologist time may be better directed towards meeting the symptomatic breast 2-week wait standard.