(24)

全方位乳房影像新發展：由診斷到治療

Comprehensive Breast Imaging Updates: From Diagnosis to Treatment

時　　間：113 年 6 月 22 日(星期六) 13:30~17:30
地　　點：臺北榮民總醫院 三門診 9 樓 *CiC* 創新沙龍

13:20-13:30	***Opening Remarks***	邱宏仁主任/理事長 Hong-Jen Chiou
	座長：徐先和 主任 / 教授 (Hsian-He Hsu)	
13:30-14:00	對比顯影乳房攝影之臨床應用 Applications of Contrast-Enhanced Mammography in Clinical Settings	林寬仁醫師 Christopher Kwang-Jane Lin
14:00-14:30	數位斷層乳房攝影之臨床助益:臺北榮總範例分享 DBT Really Helps! Some Interesting Cases from VGHTPE	賴亦貞醫師 Yi-Chen Lai
14:30-15:00	在 IVIM MR 成像中使用高光譜成像技術進行乳房組織特徵識別 Breast Tissue Signature Recognition Using Hyperspectral Imaging Techniques in IVIM MR Imaging	陳詩華醫師 Si-Wa Chan
15:00-15:30	***Coffee Break***	
	座長：曾令民 副院長 (Ling-Ming Tseng)	
15:30-16:00	以真空輔助乳房切片施行於 BI-RADS 4 病灶：技術面與術後處置探討 Vacuum-Assisted Breast Biopsy for BI-RADS 4 Findings: Technical Aspects and Postbiopsy Management	王甄醫師 Jane Wang
16:00-16:30	超音波導引真空輔助微創手術作為良性乳房腫瘤切除的臨床應用 Ultrasound-Guided Vacuum-Assisted Excision: Clinical Applications for Benign Breast Tumor(s) Removal	林文瓊醫師 Wen-Chiung Lin
16:30-17:00	冷凍治療於乳癌之應用：個人經驗分享 Cryotherapy in the Management of Breast Cancer: Sharing of Personal Experience	賴鴻文醫師 Hung-Wen Lai
17:00-17:10	討論 Discussion	

Applications of contrast-enhanced mammography in clinical settings

對比顯影乳房攝影之臨床應用

Kwang-Jane Lin

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醫療財團法人辜公亮基金會和信治癌中心醫院 放射診斷科

CEM combines digital mammogram with administration of intravenous contrast medium in identifing neovascularity associated with breast malignancy. It has higher sensitivity, specificity, positive and negative predictive value as compared with ultrasound plus tomosynthesis. Its clinical applications such as: (1) abnormalites seen at screening mammogram ie. Masses, asymmetry, architectural distortion, microcalcifications (2) symptomatic breast disease ie. localized breast pain, palpable mass, nipple discharge. (3) disease extent of breast cancer. (4) Response to neoadjuvant chemotherapy. (5) as an alternative to MRI.

We have 274 CEM examinations during the period between 2021/10-2023/10 (total 300 examinations excluding 26 examinations of Ca. pre-treatment evaluation and Ca. pre-C/T or post- C/T evaluation). The causes of examinations: asymmetry 107(35%), calcifications 82 (27%), distortion 27(9%), mass 12 (4%), abnormal sonographic findings 21 (7%) and other causes. 29 cancers detected among 274 examinations, cancer detection rate: 10.5% (19 DCIS, 7 IDC, 2 ILC and 1 tubular. Ca.). No LN metastasis found in these 29 cancers detected, rate of early breast cancer was 86.2% (25/29) (DCIS plus less than 1 cm invasive Ca. without LN metastasis). Among these 29 cancers detected, 34.4 % Ca. were not diagnosed by mammogram; 65.5% Ca. were not diagnosed by sonogram. 24.1% Ca. were diagnosed by CEM only. CEM showed better performance in detection of early breast cancer.

DBT really helps! Some interesting cases from VGHTPE

數位斷層乳房攝影之臨床助益：臺北榮總範例分享

Yi-Chen Lai

賴亦貞

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臺北榮民總醫院 放射線部 超音波暨乳房影像醫學科

Digital breast tomosynthesis (DBT) has been widely applied to both screening and diagnostic mammography. The fundamental of DBT is using off-axis acquisitions shift to separate the objects in different heights, and reconstructing the data to generate images enhancing the objects from a giving height by shifting the projections. Synthetic Mammography (SM) derives from DBT slices. The purpose of SM is to eliminate double exposures for full-field digital mammography (FFDM) and DBT. DBT plus SM reduces approximately 45% dose compared with DBT plus FFDM.

DBT has not only reduced the recall rate but also increased the invasive breast cancer detection rate. We present our clinical experience with case sharing from our hospital that how DBT enhance our daily diagnosis in asymmetries, masses, architectural distortions and calcifications.

DBT improves the conspicuity and margin visualization of masses. DBT demonstrates better the identification and location confirmation of asymmetries. DBT also depicts more FFDM or spot compression occult and subtle architectural distortions. We can recognize the benign calcifications, such as skin calcifications and vascular calcifications easily by viewing the DBT slices. DBT is non inferior to FFDM with suspicious calcifications detection in breast cancer screening. DBT shows better distribution of calcifications.

DBT is the next generation of FFDM. DBT helps us find more breast cancer and dismiss the normals. We should be more confident with using DBT in the future.

Breast tissue signature recognition using hyperspectral imaging techniques in IVIM MR imaging

在 IVIM MR 成像中使用高光譜成像技術進行乳房組織特徵識別

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In lecture, we will explore a pioneering approach to breast cancer detection, stepping beyond the traditional delayed contrast-enhanced breast MRI (DCE-MRI), which, despite its sensitivity, struggles with distinguishing between benign and malignant tumors and carries the risk of contrast media toxicity. We'll introduce an innovative technique utilizing apparent diffusion coefficient (ADC) and intra-voxel incoherent motion (IVIM) parameters, aiming to overcome these challenges.

Using a 3T MR system, our technique involves capturing axial IVIM images via echo planar imaging (EPI), covering both breasts. This method is enhanced with spectral pre-saturation inversion recovery and diffusion sensitization, applying weighting factors across a broad spectrum. This detailed analysis enables the differentiation of breast tissue types with remarkable clarity, based on quantitative parameters and signal intensity decay maps. Our approach reveals distinct patterns in the quantitative values of glands and fat, providing deeper insights into breast tissue composition.

We also delve into hyperspectral processing for analyzing diffusion-weighted imaging (DWI) at varying b values. By integrating advanced methods such as kernel constrained energy minimization (KCEM), iterative KCEM (IKCEM), and deep neural networks (DNN), we aim to significantly improve tumor detection precision. The effectiveness of these techniques is evaluated using 3D receiver operating characteristic (3D-ROC) analysis, highlighting their potential to revolutionize breast cancer diagnostics.

This lecture is designed to shed light on a safer, more accurate approach to breast cancer detection, encouraging a move away from reliance on contrast media and towards enhancing diagnostic specificity and sensitivity. Our discussion promises to be an insightful journey into the future of non-invasive cancer diagnostics, marking a critical advancement in patient care and treatment strategy.

Vacuum-assisted breast biopsy for BI-RADS 4 findings: Technical aspects and postbiopsy management

以真空輔助乳房切片施行於 BI-RADS 4 病灶：技術面與術後處置探討

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The presentation will be focused on vacuum-assisted breast biopsy (VAB) by stereotactic (or tomosynthesis)-guidance and MRI-guidance.

VAB features minimally invasive approach to target breast findings with diagnostic accuracy close to excisional biopsy. Stereotactic-guided VAB is indicated for suspicious appearing findings (BI-RADS 4 findings) depicted on mammograms, especially for mammographic-visible microcalcifications.

Tomosynthesis-guided VAB is the advanced design of stereotactic-guided VAB, can further applicable for abnormal findings only or more depicted on tomosynthesis such as architectural distortion. Pre-biopsy survey includes imaging preview for lesion location, breast thickness, lesion types and number, coagulation profiles. The suggested VAB workflow and trouble-shooting issues will be presented and discussed. The B3 lesions indicate those of uncertain malignant potential at histopathology. The VAB-yielded B3 lesions cover a wide-range of pathological diagnosis such as ADH, FEA, classical lobular neoplasm, papillary lesions, radial scar, phyllodes tumor. The postbiopsy management for the various B3 lesions, and the postbiopsy complications will be presented.

MRI-guided VAB is exclusively performed for the suspicious findings depicted on MRI, especially for MRI-only lesions. MRI-suspicious findings can be re-evaluated by second-look ultrasound. There are possibilities that the biopsy findings via second-look ultrasound are not correlated with the MRI findings, therefore, it is appropriate to leave a clip for ultrasound-biopsied finding followed by MRI correlation to revalidate. The different vendor design of MRI-guided VAB will be presented. The postbiopsy management for procedure-related complications and B3 lesions from stereotactic/tomosynthesis-guided VAB also applies to MRI-guided VAB.

In conclusion, VAB is a minimally invasive approach for BI-RADS 4 findings with high accuracy. However, the prebiopsy evaluation and postbiopsy management are mandatory to improve patient care and clinical outcomes.

Ultrasound-guided vacuum-assisted excision: Clinical applications for benign breast tumor(s) removal

超音波導引真空輔助微創手術作為良性乳房腫瘤切除的臨床應用

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The first consultant-led one-stop diagnostic breast clinic in the world was available in the 1990s. Women can be investigated appropriately using mammography, ultrasonography and cytology with immediate reporting. A breast clinic with a combination of breast imaging study and interventional procedures, provides an efficient and comprehensive process for breast tumor diagnosis and treatment.

Core-needle biopsy (CNB) was a well-established, valuable technique that was still used in most cases, whereas vacuum-assisted biopsy (VAB) is a more recent technique. VAB has proven clinical value and can be used under sonographic, mammographic, and magnetic resonance imaging guidance. This method has been proven reliable and should replace surgical biopsies. As of 2010, studies began to report the possibility of excising lesions using this method, either as a secondary benefit or as an initial indication, referring to it as vacuum-assisted excision (VAE). Since then, VAE has been ever more widely used in clinical practice.

In recent years, as interventional radiologists, we set up a brand new imaging-led breast intervention clinic using conventional imaging diagnostic tools, and implemented VAB/VAE to provide more rapid and comprehensive treatment/diagnosis of breast tumors.

To date, VAE has had numerous applications: for removal of benign lesions when patients need; for excision of previously biopsied lesions with a histological diagnosis of high risk or uncertain malignant potential (B3 lesions); and for a repeat biopsy in cases in which there is discordance between the radiological and pathological findings.

It is crucial for interventional radiologists to understand the current scenario and the potential applications of VAE, because it can change the clinical management of some breast lesions by updating practices over the years.

Cryotherapy in the management of breast cancer: Sharing of personal experience

冷凍治療於乳癌之應用：個人經驗分享

Hung-Wen Lai

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Breast cancer is the most common cancer in women in Taiwan, and the leading cause of death in women. Early diagnosis and appropriate treatment of breast cancer is very important. Surgery, radiotherapy, chemotherapy, endocrine therapy and target therapy are important treatments for breast cancer. Nowadays, for early stage breast cancer, surgical treatment had evolved from modified radical mastectomy to breast conserving surgery. Sentinel lymph node biopsy also replaced axillary lymph node dissection. Recently, non-surgical ablation is emerging as an alternative local therapy option for patients with early-stage breast cancer and encompasses two main types of percutaneous therapeutic procedures: radiofrequency ablation and cryoablation. Both techniques involve obliteration of a spherical lesion and feasibility studies have shown that complete tumor ablation is achievable with good or excellent cosmetic results. Although few clinical studies have directly compared non-surgical ablation with conventional surgical resection, observational studies indicate that clinical outcomes are favorable with acceptable rates of local control and no detriment to long-term survival. Cryoablation is a minimally invasive technique currently employed in breast cancer care, that uses freeze and thaw cycles to treat benign breast lesions, small breast cancers or focal sites of metastatic disease in patients not eligible for surgery. The final goal of this procedure is to destroy breast cancer cells using extreme cold. In addition, several studies have shown that this technique seems to have an enhancing effect on the immune response, especially by increasing the expression of tumor neoantigens specific to tumor cells, which are then attacked and destroyed. Exploiting this effect, cryoablation in combination with immunotherapy could be the key to treating early-stage breast cancers or patients who are unsuitable for surgery. The preliminary experience of cryoablation used in the treatment of breast cancer and a literature review would be performed in the presentation.