



ADVANCES IN CARDIAC ULTRASOUND

- CONTRAST ECHOCARDIOGRAPHY

Echocardiography is an essential tool in the diagnosis and prognosis of various cardiac conditions. However 1 in 5 echo studies have suboptimal images, preventing accurate assessment of the structure and function of the heart (Fig. 1). Contrast use is standard for many non-invasive imaging modalities to enhance image quality and guide clinical decisions. Advances in microbubble and ultrasound harmonic imaging technology have made contrast use in echo feasible as well. Echo contrast has been demonstrated to be very safe and should be the standard of care when resting images are suboptimal, and is particularly useful in the following clinical scenarios:

- 1) When accurate measures of left ventricular (LV) volume or function are crucial to guide management decisions, such as accurate ejection fraction (EF) monitoring in patients undergoing cardio toxic chemotherapy, or determining the need for implantable cardiac defibrillator
- 2) During stress echo imaging to improve the sensitivity for detecting significant coronary obstruction
- 3) Evaluation of ambiguous or suspected LV structural abnormalities can be made more confidently on echo after the addition of contrast, such as: apical hypertrophic cardiomyopathy, ventricular non compaction, LV apical thrombus, complications of myocardial infarction such as LV aneurysm, pseudoaneurysm and myocardial rupture, detection and correct classification of intracardiac masses such as tumour or thrombi
- 4) Doppler signal enhancement when a clearly defined spectral profile is not visible, will allow more accurate evaluation of diastolic and valvular function
- 5) Myocardial contrast perfusion echo is another promising new application that can add another level of accuracy and prognostic value to current stress echo imaging

In a key study by Kurt et al (J Am Coll Cardiol 2009) of over 4000 echoes, contrast echo significantly improved segment visualization in the suboptimal studies. Improved visualization led to 17% major changes in the originally estimated EF, 28% new wall motion abnormalities not seen at baseline, patient management modification in 35% of cases, avoidance of planned procedures in 25% of cases, initiating or stopping medications such as anticoagulants or hemodynamic drugs. All these highlight the efficacy of contrast in helping to make better clinical decisions in routine daily practice. Regrettably, current widespread adoption continues to be hampered by the lack of understanding of the new agents, experience and clinical expertise in its use, as well as by previously exaggerated safety concerns. Much work remains to be done to promote echo contrast as an essential technique in any cardiologist's echocardiography toolbox for improving patient care.

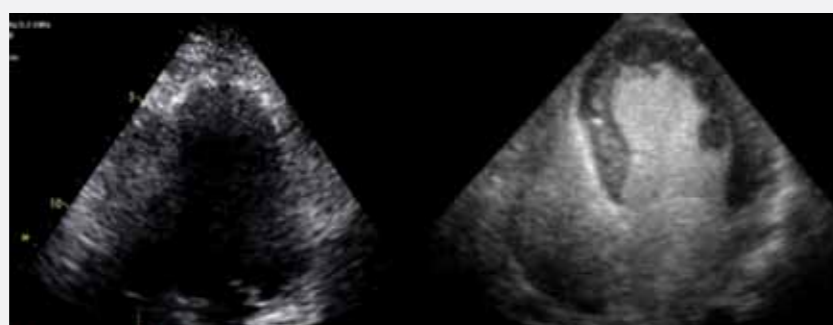
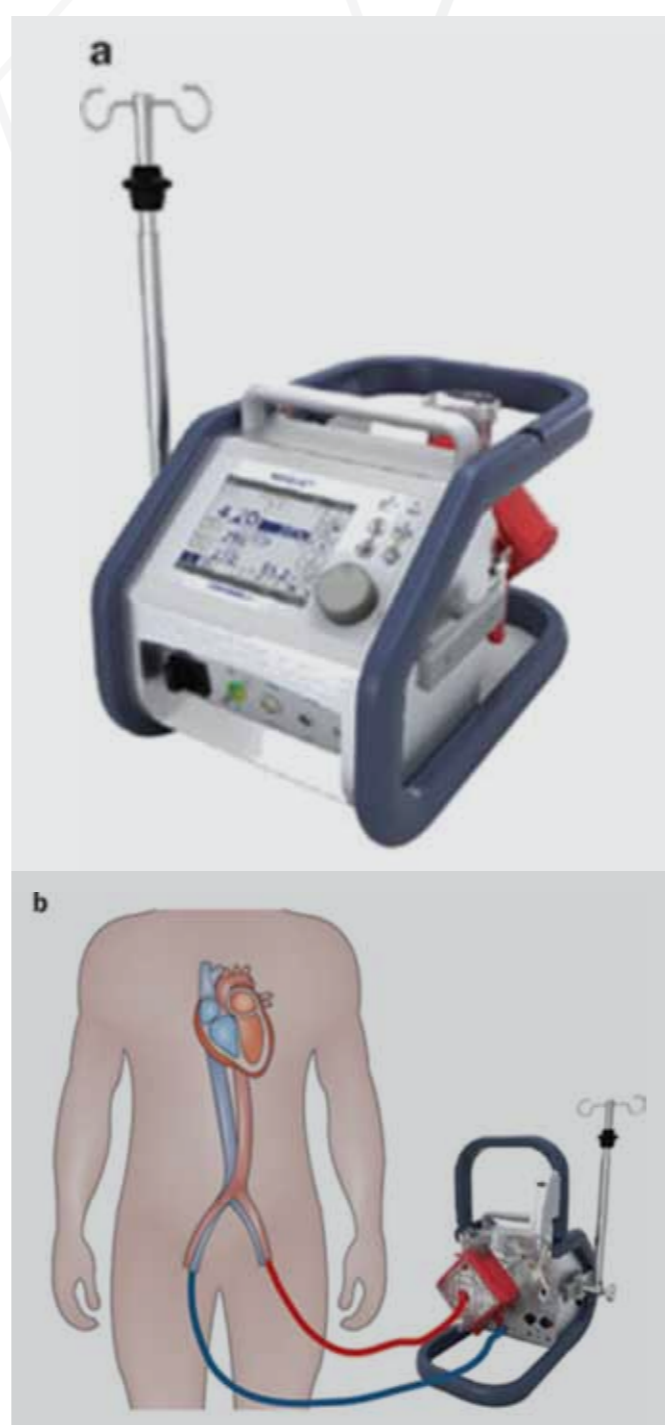


Fig 1. Left image is a suboptimal apical 4 chamber view, right image shows LV opacification after contrast injection revealing clear delineation of the endocardium.

By **Dr. Peter Ting**

Senior Consultant Cardiologist
The Harley Street Heart & Cancer Centre

EXTRACORPOREAL MEMBRANE OXYGENATOR



Extracorporeal membrane oxygenator (ECMO) is a mechanical support for patients with cardiac or respiratory failure who are refractory to conventional support and is potentially reversible with optimal support. It allows the heart/lung to rest and recover. In modern intensive care medicine, it is increasingly been used and has been proven to be life saving for many.

ECMO is generally categorized into veno-venous (VV) ECMO and veno-arterial (VA) ECMO. VV ECMO is indicated for severe acute respiratory failure. Most commonly, these patients suffered from adult respiratory distress syndrome from various causes such as severe pneumonia.

On the other hand, VA ECMO is usually initiated for patients who suffered from acute heart failure such as acute myocardial infarction, viral myocarditis and pulmonary embolism. It provides a bridge to recovery, longer term mechanical support (left ventricular assist device) or even heart transplantation.

With ECMO support for selected patients, it can potentially reverse the otherwise fatal outcome in this group of patients.

Gleneagles hospital provides all the required resources for ECMO support. More importantly, there is a dedicated and experienced team of doctors comprising of cardiothoracic surgeon, intensivist, pulmonologist and cardiologist to drive the service. With a good understanding and knowledge of ECMO, improved technology in the different components of the device, the outcome of such support has been favorable.

By **Dr. Su Jang Wen**

Senior Consultant Cardiothoracic Surgeon
Thoracic & Cardiovascular Surgery Specialist

EMCO

BREAST CANCER

PROPHYLACTIC MASTECTOMIES AND OOPHORECTOMIES?

Was Angelina Jolie right to go for prophylactic mastectomies and oophorectomies?

You must have read in the news that Angelina Jolie has gone for bilateral prophylactic mastectomies and bilateral oophorectomies to prevent breast and ovarian cancers. The reason behind this is that she is a BRCA gene carrier. It is reported that she has as high as 75% risk of getting breast cancer by the time she reaches 70 years old, and 50% risk of getting ovarian cancer by the time she reaches 70 years old. So it does seem to make sense that she should opt for such drastic measures.

Since then, I have been receiving enquiries with regards to BRCA gene testing, as well as prophylactic mastectomies and oophorectomies. So who should have the tests done? and who should go for prophylactic mastectomies and oophorectomies?

Although the risk of breast cancer and ovarian cancers are greatly increased when a person carries the BRCA genes, it is important to note that 90% of breast cancer cases are sporadic, there is no genetic link, and that less than 10% of breast cancer patients have a family history of breast cancer, and around 1% of all breast cancer patients are carriers of BRCA genes. Therefore, only selected people need to have the genetic tests done. NCCN guidelines state that a person should be considered for further genetic evaluation if the person has any of the following history:



- 1) A known mutation in a cancer susceptibility gene within the family
- 2) Early age onset breast cancer
- 3) Triple negative breast cancer < 60
- 4) Two breast cancer primaries in a single individual
- 5) Male breast cancer
- 6) Breast cancer at any age and:
 - >1 close blood relative with breast cancer at age < 50
 - >1 close blood relative with ovarian cancer at any age

When a person carries the BRCA genes, then it is reasonable to refer that person to the surgeons to discuss the pros and cons of prophylactic mastectomies and oophorectomies.

Prophylactic mastectomies and oophorectomies should not be taken lightly as any surgeries carry both immediate risk and long term complications. It is also important to note that prophylactic mastectomies do not remove the risk of breast cancer completely, although it does reduce the risk of breast cancer drastically. Prophylactic oophorectomies in a woman at the age of 45 will increase the risk of osteoporosis and heart disease by 2 folds.

The take home message for all women who are anxious about breast cancer and BRCA gene is that BRCA gene only accounts for around 1% of all breast cancer, the chances of getting non-BRCA gene related breast cancer increases with age, a woman at the age of 30 has a breast cancer risk of around 1 in 300, but this increases to around 1 in 10 by the age of 50. Healthy living including eating 5 portions of fruits and vegetables a day, as well as regular exercise (at least 3-5 times a week) helps reduce the risk of breast cancer. Mammogram screening from the age of 40 helps detect breast cancer early, leading to curative treatments.

By **Dr. Sue Lo**

Senior Consultant Medical Oncologist
The Harley Street Heart & Cancer Centre



MOLECULAR PROFILING:

PERSONALIZING CANCER TREATMENT

Tumors are driven by alterations in the genes that regulate cancer growth. Many of these genetic alterations can be used to tailor the treatment of cancer for any particular patient. These are unique to each individual, making the treatment more personalised for every patient.

Traditionally, patients will go through standard chemotherapy as part of their cancer treatment. The development of new drugs that targeted specific pathways in cancer growth has led to significant improvement in patients' life expectancies. The drug, Trastuzumab, an anti-Her2 agent has improved 10-year overall survival (OS) from 75.2% to 84% in breast cancer patients when given after their surgery. Imatinib is a drug targets KIT-positive gastrointestinal stromal tumor (GIST). More than 90% of patients now survive after taking it for 3 years following resection of their cancer.

Similarly, in more advanced setting where the cancer has spread, many targeted agents have been shown to prolong survival and quality of life in the patients. Advanced melanoma with a usually grave prognosis, can be treated with Vemurafenib, a drug that specifically targets BRAF V600E mutation found in 50% of all melanoma. Compared with standard chemotherapy, this drug significantly increased the 6-month survival from 64% to 84%. Other examples include Pertuzumab for HER-2 positive breast cancer, Gefitinib, Erlotinib, Afatinib for EGFR mutated lung cancer, Crizotinib, Ceritinib for ALK mutated lung cancer, Trametinib and Dabrafenib for V600 positive melanoma.

Advanced cancers will inevitably progress as many acquire new mutations or develop alternative pathways for growth and metastasis. Albeit in small percentages, the presence of additional targets may produce further treatment options when standard

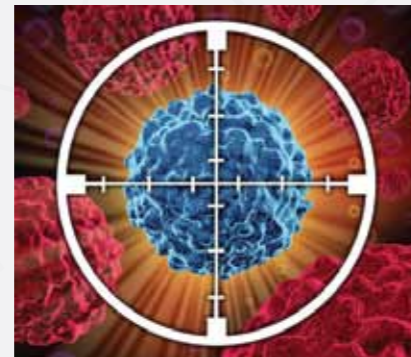


Photo Credit: <https://liferaftgroup.org>

treatment is exhausted. For example, RET rearrangements are detected in 1-2% of lung cancer. Cabozantinib, a RET inhibitor used in metastatic medullary thyroid cancer, has been shown to induce partial responses in RET-positive lung cancers. PIK3CA mutations found in some solid tumours may present a target for PIK inhibitors such as Buparlisib. There is a growing list of potentially actionable targets in development, including AKT, CDK, FGFR, FLT3, IGF, MEK, MET, PDGFR, ROS1, SRC and VEGFR to name a few.

Typically the testing is initiated by the treating oncologist whereby a sample of patient's tumour is obtained for the DNA material. This can usually be from the biopsy that was used initially to confirm the cancer diagnosis or a fresh one to confirm new metastases. The slides will be sent for sequencing for specific panels of mutations. These can range from a few genes to a comprehensive few hundred genes. With so much new information at hand, it is vital to focus on those that have drugs that target them, or had been shown in studies to have plausible mechanisms of action or efficacies.

The detailed molecular profiling of each patient's tumour will enable the best treatment planning for each particular patient. Each tumour can now be seen as unique as any individual's thumbprint and therefore, their management should not be a one-size-fit-all approach.

By **Dr. Ooi Wei Seong**

Consultant Medical Oncologist
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ECG QUIZ

Case Vignette:

Mr T was 1 day post open MV repair surgery and complained of central chest pains, radiating to his neck. He was afebrile, haemodynamically stable but slightly breathless on examination. Oxygen saturations were maintained at 97% on room air. Precordial auscultation was unremarkable. His ECG is shown below. What is the diagnosis?

503651 09/06/2015 08:39:12 [REDACTED] Dept: ICU
Born 20/07/1965 Male
Rate 81 - Sinus rhythm.....Normal P axis, V-rate 50-99
PR 209 - Borderline prolonged PR interval.....PR >202, V-rate 50-90
QRS 99 - Anterolateral infarct, acute (LAD).....ST >0.20mV, V2-V6, I, aVL
QT 362 - ST elevation, consider inferior injury.....ST >0.08mV, II III aVF
QTc 421
--AXIS--
P 108
QRS 23
T 19



*Answer is available on our website: www.heartandcancercentre.com

By **Dr. Rohit Khurana**

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THE HARLEY STREET HEART & CANCER CENTRE



From left to right:
**Dr. Reginald Liew, Dr. Ooi Wei Seong,
Dr. Sue Lo, Dr. Rohit Khurana, Dr. Peter Ting**

INTRODUCTION

NEW HEART & CANCER CENTRE, NEW DOCTORS, NEW LOCATION

Welcome to the 3rd edition of our quarterly newsletter which aims to give practical updates to general practitioners and family physicians on current developments in the fields of cardiology and oncology. In this edition, we have included a new section showing interesting ECG quiz and have a contributory guest article written by Dr. Su Jang Wen, cardiothoracic surgeon, on Extracorporeal membrane oxygenator (ECMO), a mechanical support for patients with cardiac or respiratory failure. We also include two interesting articles on management of patients with cancer, which we hope will be of use in your daily practice.

We would like to take this opportunity to introduce two new members of our team, Dr. Peter Ting (cardiologist) and Dr. Ooi Wei Seong (medical oncologist). Dr. Ting has a special interest in non-invasive cardiac imaging and cardiac rehabilitation and Dr. Ooi has a special interest in lung, head and neck and genitourinary cancers.

Our clinic at Gleneagles Hospital has moved to a newly renovated and more spacious heart & cancer centre located at Gleneagles Hospital, Annex Block (#02-38/41). This allows us to provide a more comprehensive range of cardiac and oncology services to our patients and supporting colleagues, including a newly introduced exercise and dobutamine-stress echo service, cardiopulmonary exercise treadmill testing and an increase in our in-house chemotherapy capabilities. Please feel free to visit us at our new premises and we will be more than happy to provide a tour of our clinic.

From **The Harley Street Group**

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