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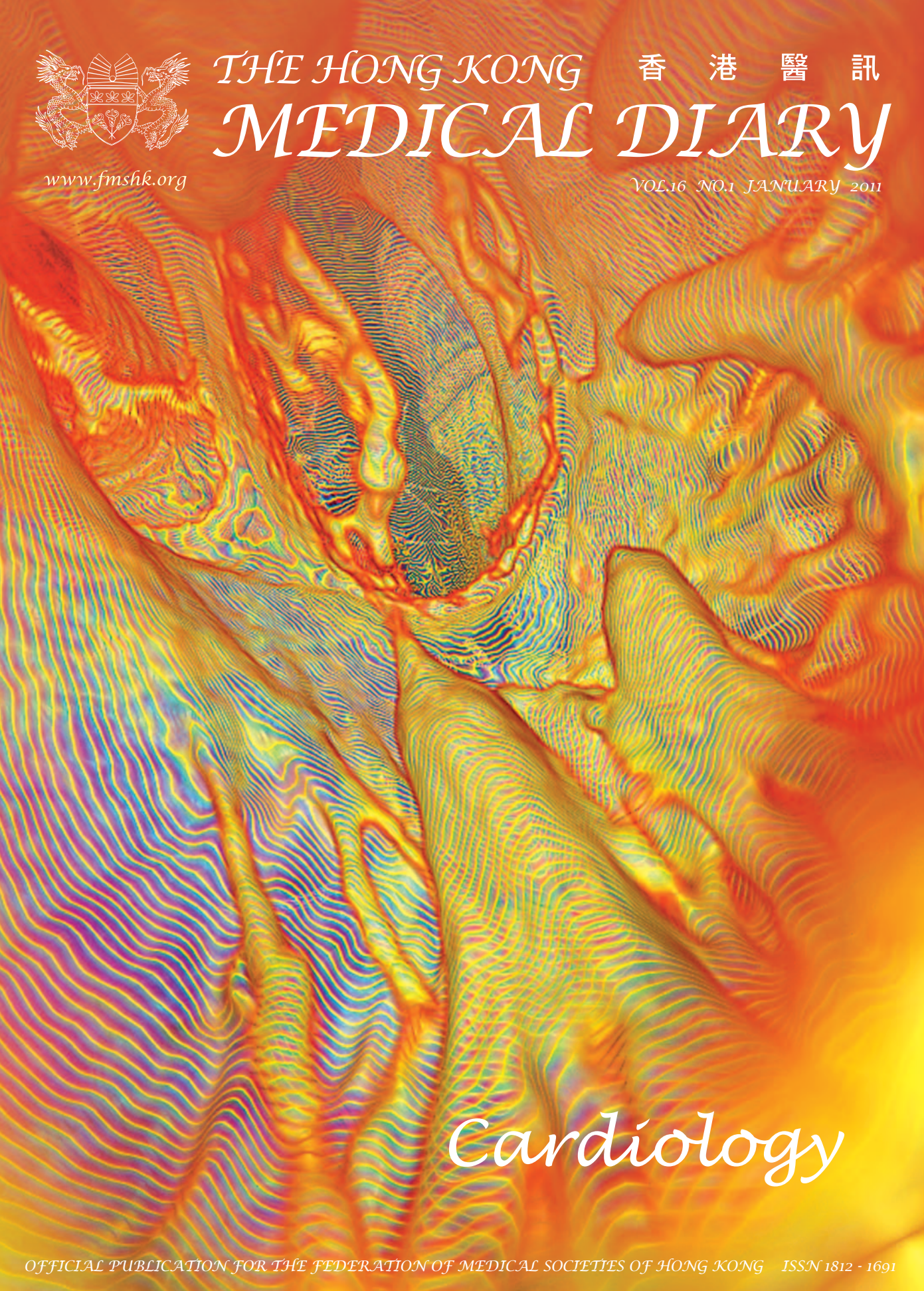

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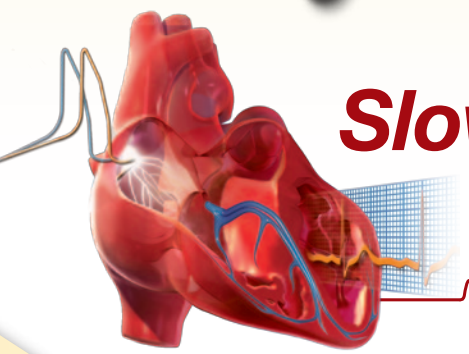

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Editorial

Dr. Chung-seung CHIANG

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Editor

Dr. Chung-seung CHIANG

'I will prescribe regimens for the good of my patients according to my ability and my judgement' – a sentence from the Hippocratic Oath written in the late 5th Century B.C. Modern medicine has advanced considerably since the time of the Hippocrates and yet the commitment of the medical profession to our patients remains unchanged.

Over the past few decades, advancement in Cardiology has been by leaps and bounds. The introduction of coronary angioplasty by Dr. Andreas Gruentzig in 1977 has started the modern era of Interventional Cardiology. Percutaneous coronary intervention (PCI) has now become the mainstay of treatment for patients with ischaemic heart disease. In this issue of the Medical Diary, I have invited Dr. Chan Kam Tim to write on the recent advances in PCI. He will introduce to us the concepts of fractional flow reserve, bioresorbable stents and drug eluting balloons. Equally amazing are advances in the field of cardiac arrhythmias. Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia. It is estimated that about 10% of the population over the age of 70 are suffering from A.F. Dr Jeffery Fung will give us an update in A.F. management. He will discuss the concepts of rhythm or rate control, stroke prevention and catheter ablation for AF. Cardiac resynchronisation therapy (CRT) is a well established non-pharmacological therapy for patients with heart failure. It has proven to improve both the survival and symptoms of heart failure patients. Prof. Yu Cheuk Man and Prof. Zhang Qing will give us an update for use of CRT.

On 6th December 2010, the Cardiology arena was glad to see that the first 2 transcatheter aortic valve implantation (TAVI) procedures using the CoreValve were successfully performed in a 84 year-old female and a 76 year-old male patients in Queen Elizabeth Hospital. This was another breakthrough in transcatheter therapy in Hong Kong. Dr. Michael Lee will give us a comprehensive review of the TAVI technology in treating patients with symptomatic aortic stenosis. Following the footsteps of TAVI, treatment of severe mitral regurgitation by a transcatheter approach using the MitraClip is now a reality. Dr. Boron Cheng will give us a highlight of this new technology.

A passion for Chinese antiques is common amongst many doctors in Hong Kong. Amongst the cardiologists I know, Dr. Patrick Ko is undoubtedly an expert in this field. I have invited him to write an article on the history of ancient Chinese jade culture in the Medical Diary in 2008. In this issue, Dr. Ko's story on Chinese jade culture will continue from the Warring States to the Qing Dynasty.

I hope our readers will enjoy reading this issue of the Medical Diary which has covered some of the cutting edge technologies and knowledge in Cardiology and I would like to wish you all a happy and prosperous 2011.

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An Update in AF Management

Dr. Jeffrey WH FUNG

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This article has been selected by the Editorial Board of the Hong Kong Medical Diary for participants in the CME programme of the Medical Council of Hong Kong (MCHK) to complete the following self-assessment questions in order to be awarded one CME credit under the programme upon returning the completed answer sheet to the Federation Secretariat on or before 31 January 2011.

Atrial fibrillation (AF) is the most common sustained arrhythmia in humans and affects 1-2% of the general population worldwide. It affects 3 and 6 million of people in United States and Europe respectively[1,2]. It has also been estimated that there are over 70,000 patients with AF in Hong Kong. Its incidence also rises with age and the lifetime risk of AF development in those older than 40 was estimated to be ~ 25%[3]. On the other hand, AF also affects a significant proportion of younger patients with a prevalence of 0.7% in those aged between 55-59 years[4]. It is also expected that these figures will increase 2.5 – 3 fold during the next 50 years[1,5]. AF doubles the risk of death, increases the risk of stroke by 5 fold and heart failure by 3 fold. While it commonly co-exists with other cardiovascular disorders, it also adversely affects the prognosis in those with coronary artery disease[6], heart failure[7] or even hypertension[8]. Management of AF is a complex issue. Guidelines about the management are available[9] but the adoption into clinical practice is a real challenge and is limited by cultural, social and economic reasons[10].

Rhythm or Rate Control

Both patients and physicians may frequently ask the same question when facing AF: Is it better to be in sinus rhythm? Such a debate between rhythm or rate control has been lasting for decades and also leading to multiple randomised clinical trials testing the hypothesis that rhythm control is superior to rate control in achieving better clinical outcomes[11-17]. What was consistently observed in these clinical trials was that both strategies were equivalent if cardiovascular events like mortality or stroke were chosen to be the primary endpoints in patients at risk of stroke and with or without heart failure provided appropriate antithrombotic therapy was offered to eligible patients. In other words, proper anticoagulation, instead of deciding rate or rhythm control strategy, is probably the key to lower cardiovascular events in these patients. The clinical implications of these findings are now translated into and emphasised in the management guidelines of AF by the European Society of Cardiology 2010[2]. The guidelines clearly state that both strategies are not mutually exclusive. The focus of AF management nowadays should shift from the focus of rate or rhythm decision to the comprehensive treatment plan for an individual.

Stroke Prevention in AF

Evaluation of the thromboembolic risks in AF patients has become the top priority in the management algorithm[2]. The most widely adopted assessment tool is the $CHADS_2$ score[18]. One point will be assigned if the patient has Congestive heart failure, Hypertension, Age >75 and Diabetes mellitus and 2 points for previous history of Stroke of transient ischaemic attack. It is very useful in the primary care setting as it can be easily remembered by physicians and does not require any sophisticated investigations. Patients classified as high risk for thromboembolism ($CHADS_2$ score ≥ 2) should receive anticoagulation while those at low or intermediate risk can receive either anti-platelet or oral anticoagulation (OAC). A new assessment tool has been introduced recently, namely CHA_2DS_2-VASc, taking into account of several important predictors of stroke in patients with non-valvular AF like age group of 65-74 (1 point) and >75 (2 points), female sex (1 point) and co-existing vascular disease (1 point)[2]. It should not be considered as a brand new scheme but rather a refined version. OAC is still recommended for those with $CHADS_2$ score ≥ 2 but a detailed assessment with regard to these non-major but relevant risk factors is necessary for those with $CHADS_2$ score 0 or 1. OAC is preferred for those with CHA_2DS_2-VASc score of 1 while no antithrombotic therapy is recommended for CHA_2DS_2-VASc score of 0. The new guidelines also stress the importance of bleeding risk assessment with the HAS-BLED scheme[2]. The abbreviation stands for Hypertension, Abnormal renal or liver function (1 point each), Stroke, Bleeding episodes, Labile INR, Elderly (age >65) and Drugs (anti-platelet or non-steroidal anti-inflammatory drug) or alcohol (1 point each) with maximum of 9 points. Caution should be taken when prescribing OAC to those with HAS-BLED score ≥ 3.

The role of the novel oral direct thrombin inhibitor, Dabigatran, which has recently been approved by the Food and Drug Administration (FDA) in the United States for stroke prevention in AF, in improving the compliance by obviating the need of strict dietary requirement and frequent blood monitoring when comparing to vitamin K dependent OAC needs special attention. RELY study was a large scale prospective randomised clinical trial and clearly demonstrated that Dabigatran with dose of 110mg bd was as effective as warfarin in preventing strokes but with lower bleeding

risk while the dose 150mg bd was superior to warfarin in stroke prevention and of similar bleeding risk[19]. The safety issues like lack of specific antidote, management of haemorrhage, optimal dosage for an individual and long term side effect about this new drug remain unanswered but it seems to be a promising alternative to warfarin.

New Drug for Rhythm Control

A revised anti-arrhythmic drug scheme for achieving rhythm control has been introduced in the new AF management guideline by ESC. Dronedarone (400mg bd) has been approved as the first line therapy in AF patients with and without structural heart disease. In addition, it is the first anti-arrhythmic agent approved by FDA with the indication of reducing the risk of cardiovascular hospitalisation among patients with non-permanent AF as demonstrated in the ATHENA study[20]. The most interesting finding from ATHENA is, perhaps, that the benefit of the new drug was not limited only to those converted to sinus rhythm in the post hoc analysis[21] and may further support the notion that rate or rhythm strategy debate is probably not the key for favourable cardiovascular outcomes in selected AF patients. However, the new drug should not be considered as a true substitute for amiodarone particularly in patients with severe heart failure (New York Heart Association class III or IV) as it has been associated with worsening of heart failure in the ANDROMEDA study[22]. Although the efficacy in maintaining sinus rhythm might be lower than amiodarone[23], the favourable side-effect profiles will certainly make dronedarone as the drug of choice in those with left ventricular hypertrophy, coronary artery disease and mild heart failure as stated in the new guideline. Data are lacking, however, about the efficacy of this new drug when comparing to flecainide or propafenone in those with no evidence of structural heart disease in preventing AF recurrence.

Catheter Ablation Therapy for AF

Symptoms like severe palpitation, dizziness, dyspnoea, impaired exercise tolerance are common in patients with AF. In the RECORD AF study, up to 76-85% of patients with AF were classified as having symptomatic AF. Previous studies had also demonstrated that the overall quality of life in patients with AF was even worse than those after myocardial infarction, reflecting the disturbing nature of the disease on daily living. Anti-arrhythmic drugs were ineffective in maintaining sinus rhythm with symptomatic recurrence in more than 50% in these patients even with amiodarone. In addition, the significant side effects of these anti-arrhythmic drugs e.g. liver toxicity, lung fibrosis and thyroid disorder have largely limited its role in clinical practice.

Previous studies have shown that the trigger of AF onset was commonly originated from premature atrial complex (PAC) coming from the myocardial sleeves wrapping around the ostia of the pulmonary veins. Electrical isolation of all 4 pulmonary veins preventing these PAC from entering the left atrium has been proven to be an effective method for controlling AF[24-27]. In brief, radiofrequency lesions were delivered circumferentially to all 4 pulmonary veins after transeptal puncture. With the advances in technology and 3-dimensional mapping, the procedure time and success rate have been improved substantially. The procedure time has been shortened to 3-4 hours in experienced hands. Major complications including stroke, cardiac perforation and atrio-oesophageal fistula formation were low (<1%) in high volume centres[28]. Multiple randomised clinical trials comparing the efficacy of ablation versus medical therapy in drug refractory patients have unequivocally demonstrated the superiority of ablation over medical therapy and around 70-75% of patients would become AF free after 1 year of follow up. Moreover, the symptoms and frequency scores and quality of life by SF-36 were consistently in favour of pulmonary vein isolation. In 2006, AF ablation is recommended to patients who remained symptomatic despite at least 1 anti-arrhythmic drug. In the latest guideline, the procedure can also be recommended as the initial therapy in those with minimal or no structural heart disease as the post-ablation outcomes are the most optimal in these selected patients and obviating the needs of ant-arrhythmic drugs[2].

Conclusion

With the ageing population, there will undoubtedly be a growing number of patients suffering from AF. Stroke prevention remains the top priority in the management algorithms in AF managements according to the latest guidelines. A proper risk stratification scheme is, in fact, available and should be routinely adopted in daily clinical practice. New oral thrombin inhibitors have great potential to replace the problematic vitamin K dependent oral anticoagulation drug and hopefully improve the acceptance of these evidence-based stroke prevention strategies to both patients and physicians. Novel anti-arrhythmic drugs with better side effect profiles may be useful in patients with structural heart disease but caution has to be taken in heart failure. Catheter ablation for AF is a preferred therapy in those with symptomatic AF despite anti-arrhythmic therapy and perhaps an initial therapy for young patients or those with minimal structural heart disease as they are expected to have the most favourable outcomes after ablation therapy. Rate or rhythm control strategy is no longer mutually exclusive to each other. An individualised treatment plan is needed for every single patient with AF.

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MCHK CME Programme Self-assessment Questions

Please read the article entitled "An Update in AF Management" by Dr. Jeffrey WH FUNG and complete the following self-assessment questions. Participants in the MCHK CME Programme will be awarded 1 CME credit under the Programme for returning completed answer sheets via fax (2865 0345) or by mail to the Federation Secretariat on or before 31 January 2011. Answers to questions will be provided in the next issue of The Hong Kong Medical Diary.

Questions 1-10: Please answer T (true) or F (false)

1. The incidence of AF rises with age.
2. Patients with atrial fibrillation have a 5 fold increase in risk of thromboembolic stroke when compared to those in sinus rhythm.
3. AF Patients randomised to the rhythm control arm in clinical trials have been shown to have better survival and lower risk of stroke when compared to those being randomised to the rate control arm.
4. The CHADS2 score in an AF patient with prior ischaemic stroke and heart failure is 2.
5. Mr Lee is a 76-year old gentleman and he has AF, hypertension, diabetes mellitus and warfarin should be recommended to him according to the CHADS2 score risk stratification system.
6. In the RELY study, warfarin was better than Dabigatran 110mg bd in preventing stroke.
7. Dabigatran 150mg bd is superior to warfarin in preventing stroke in AF patients based on the RELY study.
8. Amiodarone is better than Dronedarone in controlling paroxysmal AF in randomised clinical trials.
9. Dronedarone is recommended to AF patients with severe heart failure in New York Heart Association class III.
10. In patients who have recurrent symptomatic AFs despite using anti-arrhythmic drugs, pulmonary vein electrical isolation by radiofrequency ablation is superior to continuing the anti-arrhythmic drugs in randomised clinical trials.

ANSWER SHEET FOR JANUARY 2011

Please return the completed answer sheet to the Federation Secretariat on or before 31 January 2011 for documentation. 1 CME point will be awarded for answering the MCHK CME programme (for non-specialists) self-assessment questions.

An Update in AF Management

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Answers to December 2010 Issue

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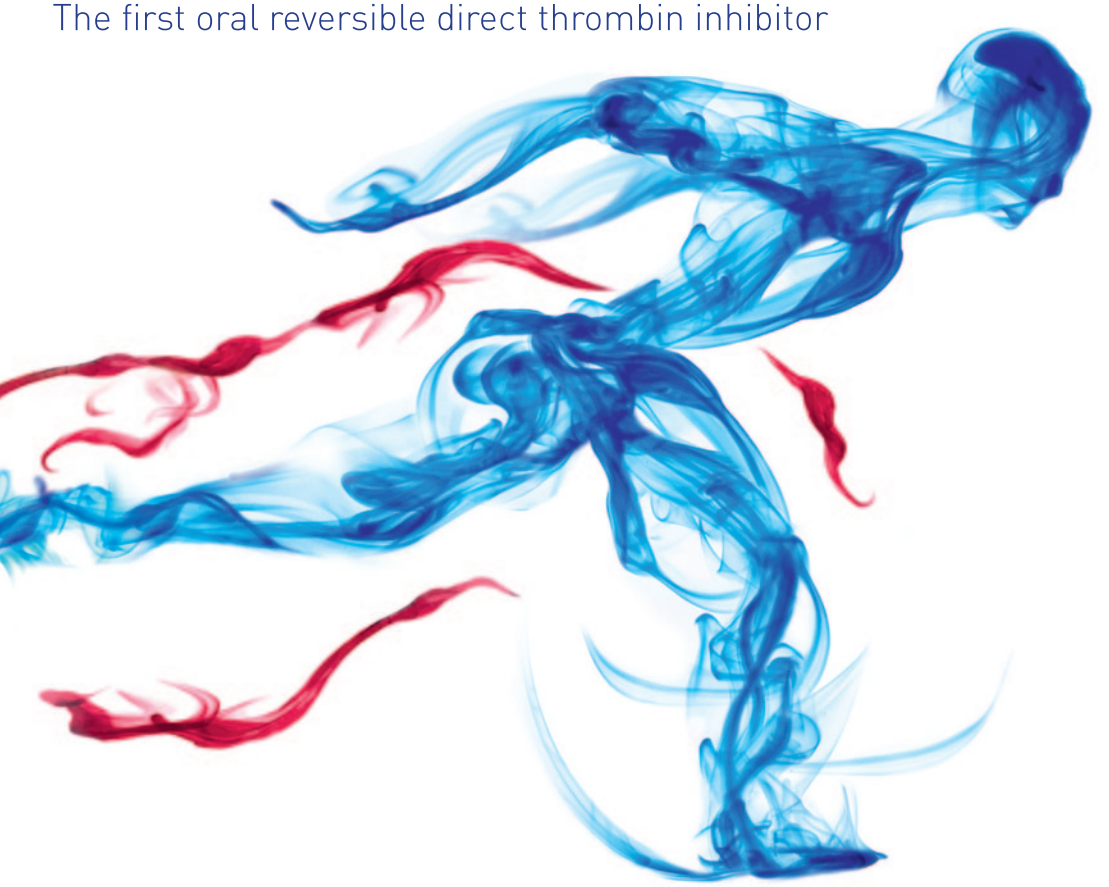

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Updates in Percutaneous Coronary Intervention (PCI)

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Introduction

Ever since the first Percutaneous Coronary Intervention (PCI) with a balloon catheter was performed in 1977 by Dr. Andreas Gruentzig,[1] many significant advances have been made in both the equipment and technology in order to make the PCI procedures more effective and safe. The development of coronary stents, initially bare metal stents and later drug eluted stents, has markedly expanded their clinical applications. However the problems of late stent thrombosis for drug eluted stents have recently aroused much concern in these devices.[2-8] In this article, I shall give a brief summary of some important advances in the field of PCI so as to illustrate our strive to find a better solution for our ischaemic heart diseases patients.

Assessment of Functional Significance of Stenotic Coronary Lesions

Conventional coronary angiography gives us a luminogram of the coronary artery and is not accurate enough to show the atherosclerotic plaque and its distribution and composition. Intravascular Ultrasound (IVUS) can tell us the exact morphological features of the coronary lesion and with Virtual Histology, the composition of the atheroma can also be clearly identified. The better resolution Optical Coherence Tomography (OCT) technology shows us a better picture of the endoluminal surface and is a great tool in assessing the completeness of endothelialisation of stent struts after implantation. However, all these imaging techniques are not providing information on the physiological significance of these stenotic lesions. Measurement of the Fractional Flow Reserve (FFR) by the Pressure wire can reveal the functional significance of the obstruction and has been proven to be very valuable in guiding intervention. FFR is the ratio of the pressure distal to the obstruction over the pressure at the proximal site during maximal vascular dilatation, and FFR is equal to 1 in normal situation. FFR measurement is independent of changes in blood pressure, heart rate, contractility and takes into account the contribution of the collateral flow. By inducing the state of maximal hyperaemia by giving either intracoronary bolus or intravenous infusion of adenosine, an FFR value < 0.75 means that the obstructing lesion is physiologically significant and requires further intervention.

The DEFER Trial (Deferral versus performance of PTCA in patients without documented ischaemia) analysed 325 patients scheduled for PCI of an intermediate stenosis. FFR was measured just before the planned intervention. If FFR was ≥ 0.75, patients were randomly assigned to deferral (Defer group; n = 91) or performance (Perform group; n = 90) of PCI. If FFR was < 0.75, PCI was performed as planned (Reference group; n = 144). The five years follow up result of the DEFER trial had shown that the long term outcomes of deferral of PCI of an intermediate coronary stenosis based on FFR ≥ 0.75 was excellent. The risk of cardiac death or myocardial infarction related to this stenosis was < 1% per year and not decreased by stenting.[9]

The FAME study (Fractional flow reserve vs. Angiography in Multivessel Evaluation) was a prospective randomised multi-centre trial involving 1,005 multivessel diseased patients, aimed to compare the clinical outcomes of PCI guided by conventional angiographic determination of severity or FFR guided therapy. The primary endpoints of the study were death rate, nonfatal myocardial infarction (MI) and Target Vessel Revascularisation (TVR) at one year. There was no differences in the number of intended lesions to be treated per patient (2.7 +/- 0.9 vs 2.8 +/- 1.0; p = 0.34) in the angiogram guided or the FFR guided groups respectively. The FFR guided group received a smaller number of stents (1.9 +/- 1.3 vs 2.7 +/- 1.2; p < 0.001). At 1 year follow up, the composite end point was 13.2 % in the FFR group and 18.3% in the angiogram group (p = 0.02). The FAME trial suggested that by assessing the physiological significance of the stenosis by FFR, the 1 year clinical outcomes of the patients could be improved.[10-11] Recently, the 2 year data of the FAME trial have been announced and shown that the FFR guided PCI still has a consistently better outcome than the Angiogram guided group.[12]

For patients with multivessel diseases, it is always difficult to determine which lesion needs to be treated. Revascularisation of lesions producing ischaemia will improve outcomes, but intervention of the stenotic non-ischaemia producing lesions is less clear. Intraprocedural application of the FFR to assess the functional significance of individual lesions will define the optimal revascularisation strategy, and help to improve the clinical outcomes. [10-11]

Percutaneous Coronary Intervention in Acute Myocardial Infarction

The management of patients with acute ST elevation myocardial infarction (STEMI) continues to evolve. The results of the protective devices and rheolytic

thrombectomy by angioget have been proven to be quite unsatisfactory by clinical trials. Although aspiration thrombectomy in these thrombotic situations seems to be intuitive, many previous studies have reported conflicting results. Recently, two clinical trials have yielded more favourable results. The EXPIRA (Impact of Thrombectomy With Export Catheter in Infarct-related Artery on Procedural and Clinical Outcomes in Patients With Acute Myocardial Infarction) trial randomly assigned 175 STEMI patients to conventional primary PCI or aspiration thrombectomy.[13] The primary endpoints of ST segment resolution and myocardial brush grade ≥ 2 occurred more frequently in the aspiration group.(64% vs 39%; p= 0.0001; 88% vs 60%; p= 0.0001). The thrombectomy group also had a lower mortality rate at 9 months (0% vs 4.6%; p= 0.02).[13]

The TAPAS trial (Thrombus Aspiration During Percutaneous Coronary Intervention in Acute Myocardial Infarction Study) was a single centre study and randomly assigned 1,071 patients with STEMI to thrombus aspiration or conventional PCI.[14] At 1 year follow up, cardiac death or reinfarction occurred in 5.6% of patients in the aspiration group and 9.9% of the conventional treatment group.(p= 0.009). Although more data are required to routinely recommend aspiration thrombectomy in primary PCI, these two studies support the use of simple aspiration for these high risk patients, especially those with a heavy thrombus burden.

There are convincing data supporting the use of primary PCI for treating STEMI patients. However, when PCI facilities are not available, thrombolytic therapy is still the main stay of treatment. Recent trials also clearly redefined the role of transferring patients to PCI centres for this effective therapy. The TRANSFER AMI trial (Trial of Routine Angioplasty and Stenting After Fibrinolysis to Enhance Reperfusion in Acute Myocardial Infarction) randomised 1,059 STEMI patients to receive thrombolytic (tenecteplase; TNK) with subsequent transfer for rescue PCI when required or direct transfer and routine PCI within 6 hours for all patients after TNK.[15] The composite primary endpoints of death, myocardial infarction, recurrent ischaemia, heart failure and shock were lower in the early transfer PCI group (10.5%) than in the standard therapy group (16.5%; p= 0.001). There was similar incidence of major bleeding in both groups (4.3% and 4.6%; p= 0.88). The result of this trial strongly supports that among patients treated with fibrinolysis, routine and early transfer of all patients for adjunctive PCI is superior to a strategy of delayed transfer for rescue PCI in those with failed fibrinolysis.

Advances in Stent Technology and Platforms

Despite the proven benefits and efficacy of drug eluted stents, recent concerns have been raised over their long term safety, especially the issue of late stent thrombosis.[2-8] The causes of stent thrombosis are multi-factorial, attributable to the interplay between patients and lesions factors. The persistence of the stents or the non-absorbable polymers causing inflammation may also be a feasible contributing factor.[5] Many advances have been made in the area of stent technology, trying to make the next generation stents more efficacious and safer in their application. These include the development of Drug Eluted Stents (DES) with biodegradable polymers, DES that are polymer free, DES with novel stent platforms and coatings and a completely bioresorbable stent.16 A complete description of all these new technologies is beyond the scope of this article, however, I would like to elaborate on the certain developments that are considered important in the future management strategies of coronary artery diseases.

Bioresorbable Stent

There are currently many long term limitations inherent in the technology of metallic stents. The persistence of the metallic material or the polymer may induce inflammatory response and may contribute to the occurrence of late stent thrombosis. These stented vessels also exhibit impaired endothelial function and render patients unsuitable for subsequent bypass grafting. Other imaging modality like the computerised tomography angiography (CTA) might be difficult to be applied to these stented segments. In order to overcome these problems, a stent that will be entirely resorbed after completing its defined role is a very attractive innovation.

The Abbott Vascular (Santa Clara, CA, USA) fully Bioresorbable Vascular Scaffold (BVS) stent has been demonstrated to have a very satisfactory safety profile and clinical outcomes in clinical trials. This new technology is truly an important step forward in the field of PCI. The BVS is made of polylactic acid (PLA), a proven biocompatible material commonly used in medical implants like resorbable sutures. The antiproliferative drug used is Everolimus (Novartis Pharmac.), and is effective in inhibiting the neointimal hyperplasia and smooth muscle cell proliferation. The PLA can be completely metabolised and resorbed by the body and leaves no stent materials inside the artery after 2 to 3 years. The vessels can then resume the ability to flex, contract and pulsate with response to various stimuli, similar to an untreated vessel. (The concept of Vascular Restoration Therapy)

In order to prove its clinical efficacy and safety, the ABSORD trial (a prospective, non-randomised, open label, two phase study) had enrolled 131 patients from New Zealand, Australia and Europe. (30 patients were in the cohort A – the first in men study; the next 101 patients in the cohort B with an improved stent design). The endpoints were the acute results of the BVS, Major Adverse Cardiac Events (MACE) rate and stent thrombosis (ST) rate at 30 days, 6, 9, 12 and 24 months. The patients would be followed up clinically up to five years. Various imaging studies by angiography, Intravascular Ultrasound and Optical Coherence Tomography would be performed at 6, 12, 18, 24 and 36 months. In all the 101 patients, there was no stent thrombosis at 6 month and the MACE rate was 5%.

Two-year follow-up of this first-in-men trial using the BVS Everolimus-Eluting Stent system demonstrated an in-stent late loss of 0.48mm and diameter stenosis of 27%. The two-year OCT and IVUS imaging analysis demonstrated a luminal area enlargement when

compared to 6 months, due to a decrease in plaque burden without any change in vessel size. In addition, vasomotion was restored at the stented site and adjacent coronary artery at 2 years. Clinical outcomes at 3 years have been recently published and it demonstrated a sustained low MACE rate of 3.4% without any late complication of ST.[17-27]

The ABSORD EXTEND trial is a single arm study that will enroll patients at up to 100 centres in Europe, Latin America, Canada and Asia Pacific regions. It aims to recruit approximately 1,000 patients, including patients with more complex coronary artery diseases. Key endpoints of the study include MACE and stent thrombosis rates at 30 days, 6, 12, 24 and 36 months, as well as an assessment of the acute performance of the bioresorbable vascular scaffold, including successful deployment of the system. This will provide more data on the efficacy and safety of the BVS in a more real-life patient population and better define the potential role of this innovative technology.

Advances in Balloon Technology – the Drug Eluting Balloon (DEB)

Another new advance in the field of interventional cardiology is the development of balloons coated with anti-proliferative drug on the surface. When the balloon is inflated against the arterial wall, the drug will be delivered locally and diffuse directly into the vessel wall to mitigate the restenosis of the artery over time. One of the problems with the use of Drug Eluted Stent is the failure to elute the drug to the entire vessel wall, allowing areas for potential cell growth in areas between the struts. Maximum stent coverage of a vessel wall is around 15-20% only, while on the contrary, the coverage by a DEB is 100%.

The deployment of coronary stents may not be feasible in certain specific lesion subsets like very small vessels with long diffuse diseases, very distal tortuous lesions and small bifurcation lesions. Patients with In-stent restenosis (ISR) of either the drug eluted stents or bare metal stents also pose great challenges for interventional cardiologists. The development of drug eluting balloons (DEB) enables the local delivery of the anti-proliferative drugs directly to the vessel walls and eliminate the potential problems of stenting in small sized vessels. The absence of the rigid stents and the polymers may reduce the chronic inflammation and theoretically decreases the triggers for late stent thrombosis. The good deliverability will allow the DEB to treat those very tortuous, distal and small diffusely diseased vessels. It is also a good tool to deal with the problems of ISR, where additional stent in stent strategy will increase the metal load, has higher chance of restenosis again and stent thrombosis. The absence of the stent struts and local drug delivery also diminish the need for prolonged dual anti-platelet therapy. However, DEB is still unable to overcome the problem of acute elastic recoil after any simple balloon angioplasty. The combination of a DEB with a bare metal stent (BMS) may seem to be a viable option.

The most commonly used agent is paclitaxel, which is rapidly absorbed by the vascular smooth muscle cells and is retained inside the tissue for one week to exert a prolonged antiproliferative effect.[28-29] There are several devices currently available in our locality. (SeQuent Please DEB -by B. Braun; DIOR DEB – by Eurocor; In.PACT Falcon DEB – by Invatec)

Currently, many clinical trials are being performed to analyse the safety and efficacy of DEB in the treatment of ISR, de novo lesions and bifurcation lesions. [30-35]

DEB for treating In-stent Restenosis (ISR)

Scheller et al. published the results of the PACCOCATH ISR I (Paclitaxel-Coated Balloon Catheter for In-Stent Restenosis) in 2006.[30] The trial randomised 52 patients with ISR of a single lesion to either standard balloon angioplasty or paclitaxel-coated DEB. The primary endpoint of in-segment lumen loss was significantly lower in the DEB group (0.03 +/- 0.48mm vs. 0.74 +/- 0.86mm, p= 0.002). The DEB group also had significantly lower binary restenosis and MACE rates. The PEPCAD II (Paclitaxel – Eluting PTCA-Balloon Catheter in Coronary Artery Diseases) multi-centre study involved 131 patients with ISR, and were randomised to treatment with the SeQuent Please DEB (B. Braun) or the TAXUS stent (Boston Scientific).[32] At 6 month follow up, the in-segment late loss was again significantly lower in the DEB group, (0.17 +/- 0.42 mm vs 0.38 +/- 0.61 mm; p= 0.03) which also demonstrated a trend of lower binary restenosis rate (7% vs 20%; p= 0.06). At 12 month follow up, the MACE rates for the DEB and Taxus group were 9% and 22% respectively (p= 0.08), which was largely driven by the higher Target Lesion Revascularization (TLR) rate in the Taxus patients (6% vs 15 %; p= 0.15). Overall, these studies have shown that the DEB was safe and at least as effective as Taxus in treating patients with ISR.

DEB for de novo lesions :

The role of DEB in treating de novo lesions is less well defined as compared with the ISR management. Many studies have yield inconsistent results. The PEPCAD I multi-centre prospective registry analysed 120 patients with de novo lesions and a reference vessel diameter of 2.25mm to 2.8 mm.[36-37] There was a high proportion of patients (1/3) requiring stenting with a bare metal stent (BMS) after DEB due to unsatisfactory balloon results. At 6 month follow up, the late lumen loss was 0.18 mm for the DEB group, while patients with DEB and BMS had a late loss of 0.73mm. Similarly, the binary restenosis rates were 5.5% and 44.8 % respectively. The combination therapy of DEB with BMS has yielded the high restenosis rate which is quite unacceptable by the current standard.

The PEPCAD III was an non-inferiority study, and tended to compare the Cypher Sirolimus Eluting Stent (SES, Johnson and Johnson) with the Coroflex DEBlue (BMS/ DEB combination; B. Braun) in 637 patients with stable or unstable angina.[34] At 9 month follow up, the instent late lumen loss (0.16 mm vs 0.41 mm; $p < 0.001$) and ISR (2.9% vs 10%; $p < 0.01$) were both significantly lower in the SES group as compared with the BMS/ DEB arm. The total mortality was comparable in both arms, but the BMS/ DEB arm had a significantly higher MACE rates of MI, TLR, TVR and stent thrombosis ($p < 0.05$ for all).

In the PICCOLETO trial (Paclitaxel–Eluting Balloon

versus Paclitaxel–Eluting Stent in Small Coronary Artery Diseases), 57 patients with stable or unstable angina and small vessels (≦ 2.75m) were randomised to receive the DIOR DEB (Eurocor) or Paclitaxel-Eluting stents. (PES).[35] The DEB arm had a higher percentage diameter stenosis (43.6 +/- 27.4% vs 24.3 +/- 25.1%; p=0.029) when compared with the PES group at 6 month follow up. The binary restenosis rate and minimal lumen diameter were also significantly worse with the DEB and there was a trend of higher TLR in the DEB group.

In summary, the initial results of DEB are quite promising in specific patients and lesions subset, especially those with ISR. We definitely require more researches in the future to elucidate the more specific role of DEB in other patient populations.

Update on Antiplatelet Agents for PCI

It is of vital importance to prescribe dual anti-platelet therapy (DAPT) of aspirin and clopidogrel after stent implantation to prevent the disastrous complication of stent thrombosis. The patients are recommended to take at least 1 month DATP for bare metal stents and 12 months after drug eluted stents implantation. Clopidogrel is a pro-drug and requires the active metabolism by a liver enzyme, CYP2C19, for conversion to the active form to exert its anti-platelet activity. Several different alleles of CYP2C19 have been identified in the population. Depending on the alleles carried, patients may demonstrate normal, reduced or increased activity of CYP2C19. The *1 allele is the normal allele and has full enzymatic activity. The *2 and *3 alleles are the most common variants and result in complete loss of enzymatic activity. Patients carrying these two alleles have reduced clopidogrel–induced anti-platelet activity. The prevalence of *2 and *3 alleles varies with different racial backgrounds. The proportion of patients with *2 alleles is estimated to be 25%, 30% and 40-50% in Caucasians, Blacks and Asians respectively.[38-50]

Nowadays, there are laboratory tests available for checking the platelet reactivity and the Cytochrome CYP2C19 genotypes variation for patients taking the anti-platelet agents. However, there are currently no recommendations or guidelines on the use of genetic tests to monitor the anti-platelet therapy. Moreover, the effects on the cardiovascular outcomes by the number of variants carried by the patients have not been clarified yet. The US Food and Drug Administration has recently issued a boxed warning to clopidogrel, stating that, in certain patients with a genetic variation of the enzyme CYP2C19, the drug may not be metabolised properly and may not be effective for its anti-platelet activity. For these patients, a higher dose of clopidogrel (600 mg loading dose followed by 150 mg daily maintenance dose) or an alternative anti-platelet medication such as prasugrel, may be indicated. Despite these possible remedial action to increase the anti-platelet response in those poor responders, an appropriate dose regimen has not yet been established in a clinical outcome trial.[38-50] Undoubtedly, we need more large scale randomised controlled trials to give us more definitive answer to these questions.

Conclusion

In the last 30 years, there have been very significant advances made in the field of PCI. Development of new devices and technology will enable the patients to be treated with improved long term efficacy and safety. Our strive for excellence and continuous improvement will never stop and the next generation devices will overcome the limitations of old technology and markedly expand the application of PCI in our day to day practices.

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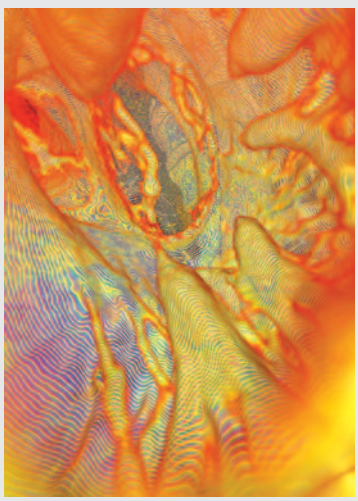
The Cover Shot



Within One's Heart #2

Peeping between the papillary muscles inside the left ventricle, this virtual reality view allows the viewers to see the aortic valve and mitral valve above (top left). The interventricular septum is seen on the left in shades of blue and green. Through the mitral valve, the thoracic spine (top center) can be seen behind the wall of the left atrium rendered in semi-transparency.

This artwork is created from computer color 3D rendering of actual cardiac CT data using a unique art method known as "Rainbow Technique" developed by Dr. Fung (published in LEONARDO journal in 2006).

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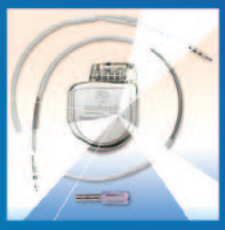




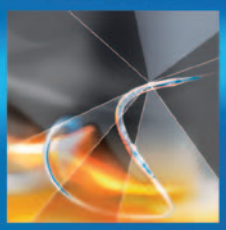



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An Update for Use of Cardiac Resynchronisation Therapy: Where Are We?

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Cardiac resynchronisation therapy (CRT) is the most established non-pharmacological therapy for patients with advanced heart failure in the last decade.[1] It is a device-based treatment modality which involves the implantation of an additional left ventricular lead through the coronary sinus to reach the free wall. This allows the simultaneous pacing of the septal wall with the use of the right ventricular lead, which can either be a pacing or defibrillator electrode. The right atrial lead will help to maintain atrioventricular synchrony, unless patients are having persistent atrial fibrillation. There has been compelling evidence from a number of multi-centre clinical trials that CRT improves symptoms, exercise capacity and cardiac function as well as reduces heart failure hospitalisations and cardiovascular mortality in patients with advanced congestive heart failure. In the current American College of Cardiology/ American Heart Association (ACC/AHA) and European Society of Cardiology (ESC) guidelines for heart failure and device-therapy, CRT in the form of pacemaker alone (CRT-P) or combined with implantable cardioverter defibrillator (CRT-D) is a class I recommendation (means absolutely indicated as supported by clinical trials) with level of evidence A (means good evidence from multi-centre clinical trials) for patients with New York Heart Association (NYHA) functional class III or ambulatory class IV heart failure symptoms despite optimal medical therapy, with left ventricular ejection fraction (LVEF) ≤35%, with sinus rhythm and QRS duration ≥ 120ms.[2,3] However, the beneficial effects of CRT have recently been demonstrated in some selected subgroups of patients who may not fulfil the aforementioned criteria. The ESC 2010 updated guideline has recently included patients with mildly symptomatic heart failure, permanent atrial fibrillation (AF) and standard pacemaker indication which will be elaborated below.

CRT in NYHA class I or II heart failure

The effect of left ventricular (LV) reverse remodelling caused by CRT in patients with NYHA class II symptoms was previously reported in a few small-scale observational studies. However, it is not until the recent publications of the 2 randomised control trials, i.e. the REsynchronization reVErses Remodeling in Systolic left vEntricular dysfunction (REVERSE), and the Multicenter Automatic Defibrillator Implantation Trial with Cardiac Resynchronization Therapy (MADIT-CRT), that the incremental benefit conferred by CRT in patients with NYHA class I or II heart failure symptoms has been confirmed.[4,5] The REVERSE trial enrolled 610 patients with NYHA functional class I (18% patients) or II symptoms, sinus rhythm, LVEF ≤40%, QRS duration ≥120ms, and LV end-diastolic diameter ≥55mm. They were randomly assigned to CRT-ON or CRT-OFF group, and followed up for 12 months. The primary endpoint was the percentage of clinically worsened patients assessed by a clinical composite parameter, while the prospectively powered secondary endpoint was the change in LV end-systolic volume index (reverse remodelling) measured by echocardiography. At the end of 12 months, no significant difference was observed in the primary endpoint that 16% of patients in CRT-ON worsened in the clinical composite score when compared with 21% in CRT-OFF (P=0.10). However, a significant degree of reverse LV remodelling was observed among patients who received CRT-ON, and time to first heart failure hospitalisation was obviously delayed (hazard ratio [HR], 0.47; P=0.03).[5] Interestingly, the extended follow up for 24 months was conducted in European patients (n=262) of the REVERSE trial, which gave rise to more promising results than that of the main study. In the CRT-ON group, 19% patients worsened compared with 34% in the CRT-OFF group (P=0.01). A progressive reverse remodelling was observed with CRT that accompanied by a significant delay in time to first heart failure hospitalisation or death (HR, 0.38; P=0.003).[6] Of note, in both 12- and 24-month analyses, there was evidence of a significantly higher proportion of patients who showed an improvement of clinical composite score in the CRT-ON group. The MADIT-CRT trial included 1,820 patients with NYHA functional class I (15%) symptoms of ischaemic aetiology or class II of any causes, sinus rhythm, LVEF ≤30%, and QRS duration ≥130ms. Patients were assigned to implantable cardioverter defibrillator (ICD) or CRT-D treatment. During a mean follow up of 2.4 years, a 41% reduction in the risk for non-fatal heart failure events was demonstrated with CRT-D, whereas the annual mortality rate showed no difference between the groups. The CRT-D group had more significant LV reverse remodelling than those treated with ICD only, which was also predictive of favourable clinical outcomes.[4] Furthermore, in pre-specified subgroup analyses of both REVERSE and MADIT-CRT trials, patients with QRS duration ≥150ms exhibited the greatest benefit from CRT.

Therefore, in the "2010 Focused Update of ESC guidelines on device therapy in heart failure", CRT preferentially by CRT-D has been recommended to patients in NYHA functional class II who have a LVEF ≤35%, QRS duration ≥150ms, and sinus rhythm, as a new class I indication, to reduce morbidity or to prevent disease progression.[3]

CRT in permanent AF

The prevalence of AF is increasingly high with the severity of heart failure, that estimated from 5-20% in NYHA class I or II to 25-50% in class III or ambulatory class IV patients. Its occurrence is usually associated with older age, more comorbidity and worse prognosis. As large, multicentre CRT clinical trials enrolled predominately patients with sinus rhythm, there are inadequate data with regard to the impact of CRT in patients with AF. However, several prospective observational cohort studies compared the effect of CRT between patients with permanent AF and sinus rhythm, which were further reported in a meta-analysis.[7] It is concluded that patients in permanent AF benefit substantially and significantly from CRT, with greater improvement in echocardiographic measurements and smaller improvement in functional outcomes, when compared with patients in sinus rhythm.[7] Since the majority of AF patients enrolled had atrioventricular nodal ablation and a wider QRS duration of ≥130ms, the evidence-based recommendation considered the inclusion of these criteria. In the 2010 update of ESC guideline, CRT is recommended for patients with permanent AF who have NYHA class III or ambulatory class IV symptoms, LVEF ≤35%, and QRS duration ≥130ms (IIa indication).[3] The requirements are similar in the current ACC guideline except that QRS duration ≥120ms is adopted instead.[2] In both, complete ventricular capture to maximise the benefits is emphasised, in the form of either pacemaker dependency induced by atrioventricular nodal ablation or adequate rate control such as through beta-blockers or digoxin therapy.

CRT in standard pacemaker indication

It has been recognised that the detrimental effects of conventional right ventricular apical (RVA) pacing on LV function and symptoms, in particular in patients with congestive heart failure. Such pacing causes an abnormal LV electrical activation sequence, manifested as LBBB on surface ECG, which leads to an electromechanical dyssynchrony and subsequent asymmetric hypertrophy, increased mitral regurgitation, and decreased EF.[8] Several observational studies demonstrated that in patients with preexisting LV dysfunction and an indication for standard pacing, CRT improved LV systolic function, exercise capacity and quality of life, when compared with RVA pacing. Moreover, a reverse remodelling effect of upgrading to CRT from long-standing RVA pacing was observed in patients with severe ventricular dysfunction and NYHA function class III symptoms, regardless of QRS width or duration of prior RVA pacing.[9] Therefore, CRT is recommended for patients with a concomitant class I pacemaker indication (ESC guideline) or anticipated frequent ventricular pacing (ACC/AHA guideline), who have LVEF ≤35%, QRS <120ms, and NYHA class III or ambulatory IV symptoms (IIa indication) and NYHA class I or II (IIb indication).[2,3]

Future perspectives on exploration of new indications for CRT

CRT is intended to treat cardiac dyssynchrony commonly observed in heart failure, which is manifested as a prolonged QRS complex of ≥120ms and being adopted in current guidelines. However, the ECG criteria are not ideal in identifying mechanical dyssynchrony. With the application of different imaging modalities such as echocardiography, lack of mechanical dyssynchrony has been found to occur in about one-third of patients with a wide QRS complex (≥120ms). Conversely, on the other hand, presence of systolic dyssynchrony occurs in 40-50% of heart failure patients with a narrow QRS complex (<120ms).[10] Therefore, it has been suggested that patients who have a narrow QRS complex and coexisting evidence of systolic dyssynchrony may also benefit from CRT. Several single-centre studies were initiated to observe the role of CRT in this special group of patients, which resulted in the improvements of functional class, exercise tolerance, quality of life and LV remodelling after a follow up at 3 to 6 months.[11,12] However, in a multi-centre trial, the Cardiac Resynchronization Therapy in Patients with Heart Failure and Narrow QRS (RethinQ), failed to provide promising results.[13] RethinQ was the first randomised study in patients with a narrow QRS complex, which recruited 172 patients in NYHA class III heart failure and with an indication for ICD implantation. All patients had a QRS width of <130ms but presence of mechanical dyssynchrony assessed by echocardiography. The primary endpoint, i.e. the increase in peak oxygen consumption, did not reach a significant difference between CRT and control groups.[13] However, improvement of NYHA class was observed in the CRT arm. Nonetheless, it is worthy of note that the selection of echocardiographic dyssynchrony parameter was not stringent, and the primary endpoint using gaseous exchange assessment was a tedious procedure. Furthermore, the choice of echocardiographic equipment could have been suboptimal while follow up was short. The ongoing study, Echocardiography Guided Cardiac Resynchronization Therapy (EchoCRT) trial, which will enroll more than 1,000 patients, utilises advanced echocardiographic techniques and investigates all-cause mortality and hospitalisation for cardiovascular events. This will, hopefully, provide a more definite answer.[14]

The benefits of CRT in patients with a normal EF and standard indications for pacing were investigated in a first prospective, randomised, controlled study, the Pacing to Avoid Cardiac Enlargement (PACE).[15] This study enrolled 177 patients who were implanted with CRT device and randomly assigned to biventricular pacing and RVA pacing arms, where the primary endpoints were LVEF and LV end-systolic volume at 12 months. As a result, conventional RVA pacing induced adverse LV remodelling with a reduction of LVEF, which was prevented by biventricular pacing. However, due to the low rate of clinical events within a relatively short period of follow up, the study was not powered to test the significant differences in clinical outcomes. Therefore, it is unknown if the favourable responses to CRT measured by echocardiographic parameters would be translated into a better prognosis in these patients. This will be addressed by the BIOPACE study which is currently underway.

Conclusion

CRT is one of the most rapidly evolving fields in heart failure management. It requires concerted efforts of heart failure specialists, electrophysiologists as well as cardiac imaging specialists, in particular echocardiographers. Therefore, a multi-disciplinary approach for patient management is essential, which starts from patient assessment, stretches through device implantation, and continues with patient follow up. Currently, researchers are actively exploring ways of fine-tuning this therapy to reach an even higher response rate, and exploring new indications to benefit more patients. Despite published data from multi-centre trials that have included more than 7,000 patients to date, more study results are expected in the few years to come. As the evidence of CRT benefits is compelling, primary care physicians and specialists who encounter heart failure patients shall bear the possibility of including CRT as an effective treatment option.

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Transcatheter Aortic Valve Implantation (TAVI) – The Time Has Come

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Introduction

Although much attention has been focused on the prevention and treatment of ischaemic heart disease in the last few decades, valvular heart disease has also resulted in significant cardiovascular mortality and morbidity[1-3]. In the ageing population, aortic stenosis (AS) is the most common valvular heart disease, with a prevalence of 4.6% in adults ≥ 75 years of age[3-4]. When the patients become symptomatic with congestive heart failure, syncope or chest pain, the average survival is only 2-3 years with a high risk of sudden death[1,5]. Surgical aortic valve replacement (SAVR) is the recommended treatment for symptomatic AS patients with a major improvement in long-term outcomes[1,5-7]. However, many symptomatic AS patients do not undergo SAVR because of underlying co-morbidities, patients' refusal or deemed inoperable by the surgeons because of advanced age or presence of co-exisiting diseases. 27-41% of patients with severe symptomatic AS do not receive SAVR[8-11]. Transcatheter Aortic Valve Implantation (TAVI) has recently provided another treatment option for the high-risk or inoperable symptomatic AS patients.

The Device

TAVI was first described by Andersen in 1992 by implanting an expandable aortic valve by a catheter technique in a closed chest pig model[12]. Several different types of aortic prosthesis have been developed since then and have been implanted in humans with success by using different transcatheter approaches. To date, the two most widespread use with the most clinical data are from two valves approved for clinical use in Europe under CE (European Conformity) Mark, namely the CoreValve (Medtronic, Minneapolis, MN) and Edwards Sapien valve (Edwards Lifesciences, Irvine, CA). Several other second generation TAVI devices have also been developed and are undergoing human feasibility studies with success.

The CoreValve

Medtronic CoreValve has developed the ReValving System which consists of a trileaflet porcine pericardial bioprosthetic valve mounted and sutured in a multi-level self-expanding Nitinol frame. The bioprosthesis is housed in a position for percutaneous delivery via a catheter-based technique, and implanted within the diseased aortic valve. The stent is carefully designed with three contiguous leaves of structure and function. The upper third of the frame has a low radial force and sits within the ascending aorta to orient the prosthesis in the aortic root. The middle third of the frame has high hoop strength and the valve leaflets are attached to this portion of the stent. It is also designed to avoid impinging the coronaries. The lower third of the frame exerts a high radial force and sits within the left ventricular outflow tract. A skirt of pericardium borders the lower portion of the valve to create a seal and prevents paravalvular aortic regurgitation[13]. The 18-F CoreValve allows the use of a percutaneous approach under local anaesthesia (with or without conscious sedation) or under general anaesthesia (with or without haemodynamic support or cardiac assistance). Rapid ventricular burst pacing or transient bradycardia may be initiated or induced during the pre-implantation balloon aortic valvuloplasty (BAV) but the implantation of the CoreValve per se can usually be done under the patients' intrinsic rhythm and heart rate. Two sizes are available: for aortic annular size of 20-23mm, a 26mm valve should be used and for 24-27mm, a 29mm valve should be deployed. The CoreValve can be implanted through the transfemoral, transaxillary, subcalvian and direct aortic approaches[14-17]. Recently, the delivery catheter of the CoreValve device has added the AccuTrak Stability Layer to enhance stability and accuracy during deployment.

The Edwards Sapien Valve

The Edwards Sapien XT valve consists of a trileaflet bovine pericardial valve mounted in a balloon-expandable stainless steel frame. The proximal portion of the stent is covered by a fabric skirt on its outer perimeter to minimise paravalvular leak[13]. The 23mm Sapien valve can be introduced via a 22F sheath, whereas the 26mm valve needs a 22F to 24F sheath, depending on the type of catheter on which the stent is mounted. The new Sapien XT valve has a significantly lower profile and is compatible with an 18F sheath. The Edwards Sapien valve has been successfully implanted via the retrograde and antegrade methods by using the transfemoral and transapical approaches[18-25]. Rapid ventricular pacing is needed during Edwards Sapien valve deployment.

Indications

Currently, the TAVI procedure is indicated for patients with symptomatic severe aortic stenosis who have an elevated surgical risk and cannot be considered for open heart surgery.

Patients might be considered a TAVI candidate if they

fulfil the following criteria:

1. Documented severe aortic valve stenosis
2. Access vessel diameter >6 mm as defined pre procedure via echocardiographic measure
3. Aortic valve annulus diameter >20 mm and < 27 mm as defined pre procedure by echocardiographic measure
4. Ascending aorta diameter < 43 mm at the sino-tubular junction
5. Native aortic valve disease, defined as valve stenosis with an aortic valve area <1cm^2 (<0.6cm^2 /m^2) as defined pre procedure by echocardiographic measure
6. Age > 80 years

Or

Surgical risk calculated with logistic EuroSCORE > 20%,

Or

Age > 65 years with one or two (but not more than 2) of the following criteria:

- Cirrhosis of the liver (Child class A or B)
- Pulmonary insufficiency : VMS < 1 liter
- Previous cardiac surgery (CABG, valvular surgery)
- Porcelain aorta
- Pulmonary hypertension > 60 mmHg and high probability of cardiac surgery for other than valve replacement
- Recurrent pulmonary emboli
- Right ventricular insufficiency
- Thoracic burning sequelae contraindicating open chest surgery
- History of mediastinum radiotherapy
- Severe connective tissue disease resulting in a contraindication to surgery
- Cachexia (clinical impression)

Patients will be excluded if they have the following conditions:

1. Known hypersensitivity or contraindication to aspirin, heparin, ticlopidine, clopidogrel, nitinol, porcine products, or contrast media which cannot be adequately pre-medicated
2. Any sepsis, including active endocarditis
3. Recent myocardial infarction (< 30 days)
4. Any left ventricular or atrial thrombus as determined pre procedure by echocardiography
5. Uncontrolled atrial fibrillation
6. Mitral or tricuspid valvular insufficiency (> grade II)
7. Previous aortic valve replacement (mechanical valve or stented bioprosthetic valve)
8. Evolutionary or recent CVA (cerebrovascular accident), (< 3 months)
9. Femoral, iliac or aortic vascular conditions (e.g. stenosis, tortuosity), that make insertion and endovascular access to the aortic valve impossible
10. Symptomatic carotid or vertebral arteries narrowing (> 70%) disease
11. Abdominal or thoracic aortic aneurysm
12. Bleeding diathesis or coagulopathy, or patients who refuse blood transfusion
13. Evolutive disease with life expectancy less than one year
14. Creatinine clearance < 20 ml/min
15. Active gastritis or known peptic ulcer disease
16. Pregnancy

Complications

Both the CoveValve and the Edwards Sapien Valve are associated with several procedural-related complications, some of which can be prevented by proper patient selection and attention to procedure details.

Access site related complications

The relatively large diameter of the early delivery catheters, using 22- to 25-F sheath and in the absence of adequate pre-operative screening of the peripheral vasculature have caused relatively high incidence of vascular complications and it was as high as 30% in the early experiences. However, dissection and perforation of the ilio-femoral arteries leading to retroperitoneal haemorrhage might still occur with the smaller 18-F sheath in the presence of excessive traumatic sheath insertion. Dissection of the ascending and descending aorta has also been reported. An extreme case of such complications can occur during sheath withdrawal and when it is met with excessive resistance, causing complete arterial avulsion and sudden haemorrahge. Successful management requires a high level of suspicion during the procedure, especially when sudden unexplained hypotension is observed. Immediate resuscitation with volume expansion and prompt angiographic assessment should be performed without delay. Occlusive balloons and covered stents have been used with success, although surgical repair might sometimes be necessary. Even after an uncomplicated vascular closure at the end of the procedure, ilio-femoral angiography should always be performed from the contralateral femoral access site to look for potential vascular complications. With proper pre-procedural CT angiography and meticulous patient selection, vascular complications have been reduced to as low as 5-6%.

Improper positioning of the valve

Accurate positioning of the valve in the proper location is of paramount importance in TAVI. Both devices cannot be retrieved or repositioned once they are deployed. If the Edwards Sapien valve is placed too high in the aorta, it might embolise into the aorta causing significant paravalvular regurgitation or even coronary artery obstruction. Occlusion of the coronary ostia is a potential catastrophic complication and the incidence is reported to be about 1%[26]. Left coronary occlusion is most commonly seen when the coronary ostium lies low in the sinus (< 7mm from the bottom of the leaflet), the native leaflet is long and has bulky calcification of the tips, and the prosthetic valve is slightly oversized. Successful percutaneous coronary intervention has been successfully performed through the CoreValve which might be life-saving[14]. If it is placed too deep into the left ventricle, it may embolise into the ventricle or the overhang of the native leaflet may prevent proper functioning of the prosthetic valve leaflets, leading to significant central aortic regurgitation. Heart block is more commonly observed with the self-expandable CoreValve system as a result of the pressure applied on the conducting tissues located subendocardially in the LV outflow tract and interventricular septum. Permanent pacemaker implantation rate was 7% and 18% respectively for Edwards Sapien valve and CoreValve[26,27]. Mitral valve injury causing acute mitral regurgitation as a result of a prosthesis extending too low into the left ventricle has also been reported although it is rare[28].

Systemic complications

Systemic complications include infection, bleeding, stroke and cardiac tamponade. The most frequent aetiology of procedural-related strokes is likely to be atheroembolism from the ascending aorta or the aortic arch. Other potential causes include calcific embolism from the aortic valve, thromboembolism from catheters, air embolism from LV cannulation, prolonged hypotension, and dissection of arch vessels. The incidence of strokes ranges widely from 0% to 10%[14,19,24,25,29], depending on the access route and the level of manipulation of the catheter in the aortic arch. Cardiac tamponade might be a fatal complication as a result of the super-stiff guidewire in a hypertrophic left ventricle with small ventricular cavity. Immediate pericardiocentesis or even surgical repair has proven to be life-saving.

Clinical Data

Percutaneous aortic valve replacement was first performed via the transseptal route by Dr. Allan Cribier in Rouen, France in April 2002. The initial experience from the compassionate use of the balloon-expandable 23mm valve from the antegrade approach was reported in the I-REVIVE (Initial Registry of Endovascular Implantation of Valves in Europe) and RECAST (Registry of Endovascular Critical Aortic Stenosis Treatment). The procedural success rate was 75%, with a 30-day mortality rate of 23%. Moderate to severe aortic regurgitation was reported in 63% of patients, partly as a result of the valve size.

In Vancouver, John Webb has implanted the Cribier-Edwards valve retrogradely via the transfemoral route, successfully in 14 of 18 patients[20]. The early mortality rate was 11% at a mean follow-up of 75 days. The same group reported both short- and long-term outcomes in an extended cohort of 50 patients[21]. Procedural success increased from 76% in the first 25 patients to 96% in the second and 30-day mortality decreased from 16% to 8%.

The first human recipient of the CoreValve was reported in 2005 by Grube et al[30]. In a single centre series reported by Grube et al, the safety and efficacy of the second (21-F)- and third (18-F)-generation CoreValve aortic valve prostheses were evaluated[26]. The 18-F device allowed the use of a percutaneous approach under local anaesthesia without haemodynamic support. In this series, a total of 86 patients with a mean valve area of 0.66±0.19 cm^2 (21-F) and 0.54±0.15 cm^2 (18-F), a mean age of 81.3±5.2 years (21-F) and 83.4±6.7 years (18-F), and a mean logistic EuroSCORE of 23.4±13.5% (21-F) and 19.1±11.1% (18-F) were enrolled. Acute device success was 88%. Successful device implantation resulted in a marked reduction of aortic transvalvular gradients (mean pre 43.7 mm Hg vs. post 9.0 mm Hg, p< 0.001) with aortic regurgitation grade remaining unchanged. Procedural mortality was 6%. Overall 30-day with a combined mortality rate was 12%. The combined rate of deaths, strokes, and myocardial infarctions was 22%.

Based on these initial data, the CoreValve and Edwards Sapien valve were approved in Europe under the CE mark in 2007 and in several other non-US countries thereafter.

An expanded 18F Registry after CE Mark approval has now included elderly and inoperable patients with severe aortic stenosis according to the IFU. A total of 1243 patients have been included in this Registry (TCT Presentation 2008). The procedure success rate was 98.2% with an increase in the aortic valve area from 0.64±0.19 cm^2 to 1.50±0.51 cm^2 at 30-days follow-up. The mean gradient was reduced from 49.6±16.8 mmHg to 9.0±6.8 mmHg at 30 days follow-up. Procedural complications included early (< 24 hours mortality) 1.7%, major bleeding (2.3%), cardiac tamponade (2.3%) access site complications (1.9%), and aortic dissection (0.4%). At time of discharge, aortic regurgitation was 0 (25.9%), 1+ (58.5%), 2+ (14.8%), or 3+ (0.8%). Thirty day all cause mortality rate was 6.7%, including cardiac death in 3.9%, pacemaker requirement in 12.2%, and a neurologic event in 1.7% (stroke in 1.4%; transient ischaemic event in 0.3%). There were no cases of strut fracture or valve migration found in this series.

The UK TAVI Registry from 1st Jan 2007 to 31st Dec 2009 in 26 centres had very encouraging results. There were 860 patients enrolled, with 460 patients implanted with CoreValve and 400 patients with Edwards Sapien. 30-days mortality was 6.9% and mid-term 1 year mortality rate was 19.7%[31].

In the CoreValve Australia-New Zealand Study, six months results from TAVI patients implanted with the Medtronic CoreValve system of 375 patients in 10 Australia-New Zealand centres have recently been presented at the 2009 Transcatheter Cardiovascular Therapeutics Scientific Session. It showed a 30-day all-cause mortality of 5.6% and 1 year all-cause mortality 10.5%. Among all the patients, 46.5% showed at least one NYHA class improvement [32].

The Italian CoreValve Registry recruited 772 patients also showed an one-year all-cause mortality of 21.2% and an one-year cardiac death rate of 11.4%. More than 50% of patients sustained improvement of at least one functional class at 1 year[33].

The results of a groundbreaking PARTNERS Trial were recently published[34]. A total of 358 patients with Aortic Stenosis who were not suitable candidates for surgery were randomised 1:1 to TAVI versus standard therapy including BAV. The study successfully met both primary and co-primary endpoints with significant reduction in 1-year mortality of 30.7% for TAVI versus 50.7% for standard therapy (p<0.001). It also demonstrated there was a significant reduction in composite endpoint of death from any cause or repeat hospitalisation of 42.5% for TAVI versus 71.6% for standard therapy (p<0.001). Among survivors at 1 year, the rate of cardiac symptoms was lower among patients who had undergone TAVI than among those who had received standard therapy (25.2% versus 58.0%, p<0.001). However, TAVI, as compared with standard therapy, was associated with a higher incidence of major strokes (5.0% versus 1.1%, p=0.06) and major vascular complications (16.2% versus 1.1%, p<0.001).

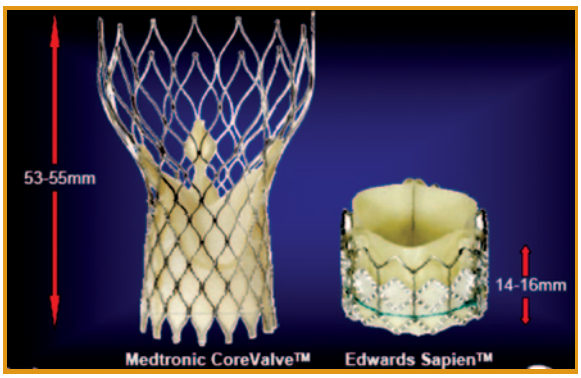
Medications post-TAVI

There is still no randomised trial on the duration of

anti-platelet agents used after TAVI but the general consensus is to prescribe Aspirin for life and Plavix for 3 months after successful TAVI procedure. If the patient is on anticoagulation for atrial fibrillation or other indications, Warfarin plus Plavix should be given for 1 month post-TAVI, followed by Warfarin plus Aspirin for 1 year and then continue Warfarin only.

Conclusions and Future of TAVI

TAVI has developed at an escalating pace and its wide application in Europe, Canada and Australasia has provided a viable alternative treatment for elderly symptomatic patients with severe aortic stenosis who are deemed high-risk for surgery. Its further development rests on the long-term data on valve function and patient survival, as well as the generalisability to other patient subsets with bicuspid and rheumatic AS, and patients with previous bioprosthesis. With continual refinement of the device which can be repositioned, with a lower still profile of the delivery system and the availability of multiple valve sizes, further expansion of the procedure to the lower risk patients may be possible when it is safer and more reliable. A number of next generation devices are on the horizon and several human studies are in the pipeline. Despite continual technical advancement of TAVI devices and procedures, the combined mortality and morbidity is still high in the range of 5-10%, especially when we are facing a group of high surgical risk patients. The multi-disciplinary team approach to involve the cardiologists, cardiac surgeons, cardiac anaethesiologists, cardiac radiologists and nurse specialists working in dedicated hybrid interventional suites will form the cornerstone for the overall success of this fascinating new era of transcatheter treatment of valvular heart disease.



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Percutaneous Intervention for Mitral Regurgitation : What is close to routine clinical use?

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Introduction

Mitral regurgitation (MR) is a significant health problem, with an estimated 4 million people in the US alone having significant MR, and 250,000 new cases diagnosed each year. Moreover, an estimated 15 million people worldwide are afflicted by congestive heart failure (CHF), with a significant proportion of these exhibiting moderate-to-severe MR. MR is associated with poor prognosis due to progressive mitral annular dilatation[1]. Whether as a result of functional heart disease or degenerative valve disease, MR is accompanied by a vicious cycle of continuing volume overload, ventricular dilatation, progression of annular dilatation, increased left ventricular (LV) wall tension, and worsening MR and CHF[2].

Treatment of MR involves (1) mitral valve replacement with mechanical or porcine valve, (2) mitral valve repair with various techniques, or (3) LV reduction surgery (in functional MR) with the latter no longer in favour. Furthermore, therapeutic options for patients with functional MR (FMR) are even more limited and medical management is largely ineffective.

Edge-to-Edge Repair Technique and Its Result

The edge-to-edge repair has been used as a surgical technique in open chest, arrested-heart surgery for the treatment of MR since the early 1990s. With this technique, a portion of the anterior leaflet is sutured to the corresponding portion of the posterior leaflet using standard techniques and forceps and suture, creating a point of permanent coaptation ("approximation") of the two leaflets. When the edge-to-edge suture is placed in the middle of the valve, the valve will have a functional double orifice during diastole, hence the alternate name for the procedure: "Double Orifice Repair" (Figure 1). The valve can still open on both sides of the suture, allowing adequate diastolic blood flow through the valve. The suture assures that the two leaflets come together properly, as required, during systole. Tissue approximation is increasingly maintained over time by the healing response that takes place between the approximated leaflets, gradually reducing the need for the mechanical support provided by the suture.

Over 1,500 open surgical procedures using the edge-to-edge technique have now been reported in peer-reviewed literature with follow-up up to 15 years. The reported mortality with this technique is similar to the mortality of the more commonly performed repair techniques[3,4,5,6]. The Alfieri surgical repair has been successfully used with midterm follow-up to treat all of the primary aetiologies of MR. Edge-to-edge repair is infrequently used in open repairs and typically only for a specific subset of patients.

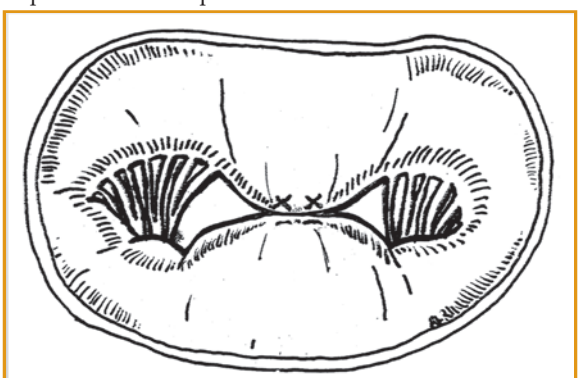


Figure 1: Edge-to-Edge Mitral Valve Repair Technique

A substantial experience of mitral valve repair procedures using the edge-to-edge technique without annuloplasty exists, including published and unpublished experience. However, in the majority of reported procedures where the edge-to-edge technique was used, an annuloplasty was also performed. As with other repair techniques, most surgeons perform annuloplasty at the time of the initial surgical repair procedure to reduce the likelihood of re-operation in the future. It has been suggested that the "edge-to-edge repair, when used alone, preserves the sphincter mechanism of the mitral valve and the systolic performance of the base of the heart. As a consequence, the annulus dilates during diastole, increasing the valve area and avoiding functional mitral stenosis"[6]. It has been shown that annuloplasty limits the natural dilation and contraction of the mitral annulus thereby impairing ventricular function[6]. In addition, failure of the annuloplasty or complications caused by the annuloplasty itself, have been reported to be causes of re-operations[6].

Percutaneous Intervention for Mitral Regurgitation – MitraClip (Figure 4)

The MitraClip is a catheter-based system that approximates open-heart surgery with the Alfieri Stitch, which provides surgical edge-to-edge repair of the

mitral valve. As a minimally invasive technique, the MitraClip technique involves percutaneous delivery of the clip to collect the anterior and posterior leaflets to create the effect of the Alfieri Stitch. The technique facilitates proper leaflet coaptation, whether for degenerative MR (DMR) or FMR, with the result that it reduces LV volume overload, creates a tissue bridge to limit dilatation of the septal-lateral (anterior-posterior) dimension, and restrains the LV wall, thereby limiting LV dilatation. The MitraClip implant for leaflet repair has been approved for use in Europe and is being applied predominantly to high-risk surgical patients with either FMR or DMR[7].

Patient selection for MitraClip percutaneous mitral valve repair

In clinical studies and the real world setting, patients considered for MitraClip percutaneous mitral valve repair have symptomatic moderate-to-severe MR or evidence of LV dysfunction in asymptomatic patients. The regurgitant jet should originate from the A2-P2 scallops of the mitral valve. Patients with an ejection fraction of less than 20 to 25% are excluded, as are patients with endocarditis, chronic rheumatic heart disease, and renal insufficiency defined as serum creatinine >2.5 mg/dL. High-risk patient factors that provide evidence of suitability for the procedure include age above 75 years with ejection fraction less than 40%, reoperation with patent grafts, post-radiation mediastinum, two or more prior chest surgeries, FMR with ejection fraction less than 40%, previous mediastinitis, and hepatic cirrhosis. Patients must have sufficient leaflet tissue for mechanical coaptation: this requires a coaptation length of >2 mm, a flail gap of <10 mm, and a flail width of <15 mm.

Clinical outcomes

There is a growing body of clinical evidence to support percutaneous mitral valve repair with the MitraClip system. In the EVEREST (Endovascular Valve Edge-to-Edge REpair Study) II pivotal trial, which enrolled 78 non-randomised high-risk patients and 279 patients who were randomised in a 2:1 ratio to receive either the MitraClip or surgery, the MitraClip procedure was associated with similar efficacy to traditional surgery but with fewer short-term adverse events[8]. In the preliminary cohort of 78 patients in the high-risk registry, Kaplan-Meier freedom from death was 94% at 1 year of follow-up and freedom from MV surgery was 83.2% (Figure 2).

In a 12-month matched pair analysis that included 34 FMR patients and 20 DMR patients, MitraClip therapy resulted in reverse LV remodelling (unpublished data). In this study, both diastolic and systolic volumes were significantly decreased with respect to baseline after MitraClip therapy in patients with FMR (Figure 3). A significant reduction in diastolic volume was also noted in patients with DMR. Furthermore, in FMR patients, MitraClip therapy resulted in significant reductions in both diastolic and systolic septal annular dimension. In the same patient cohort, there was a significant 45% reduction in the rate of re-hospitalisations for CHF. In a cohort of 16 patients requiring explant of the clip, approximately 80% of explants were conducted in DMR patients with recurrent MR being the predominant reason for explant. Subsequent treatment involving valve repair was possible in 63% of cases, while valve replacement was required in 37% of patients.

Figure 2. Kaplan-Meier estimate of freedom from death and MV surgery in high-risk patients undergoing percutaneous mitral valve repair with the MitraClip system

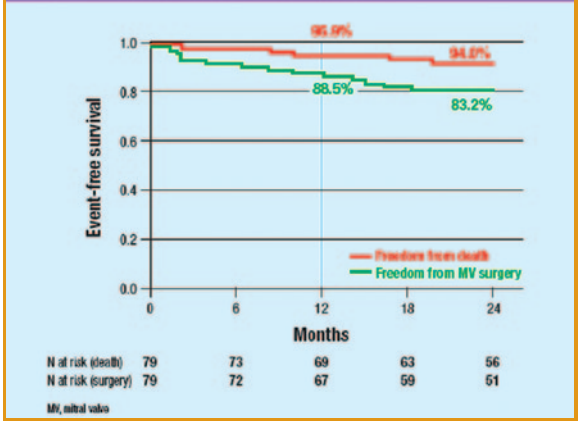
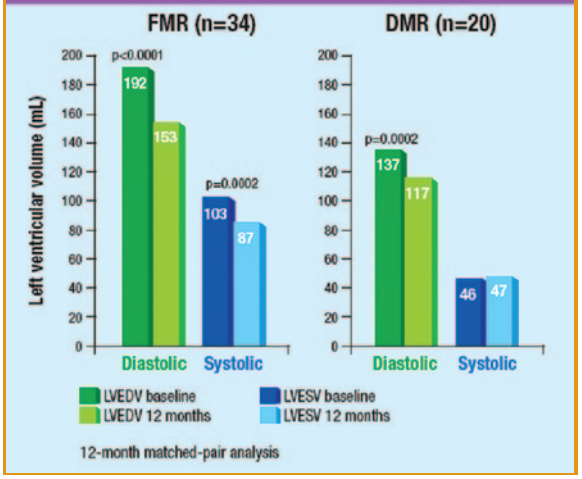


Figure 3. MitraClip therapy reverses left ventricular remodelling



Conclusions

MitraClip therapy has been shown to produce significant reductions in mitral annual dimensions and LV volumes at one year in high-risk surgical patients with MR. These data demonstrate that high-risk patients with significant FMR particularly benefit from the procedure and significant reverse LV remodelling was noted in patients with DMR. The MitraClip procedure also significantly reduces the rate of re-hospitalisation. Importantly, percutaneous intervention with the MitraClip does not prevent future successful mitral valve surgery or repair.

Figure 4: MitraClip

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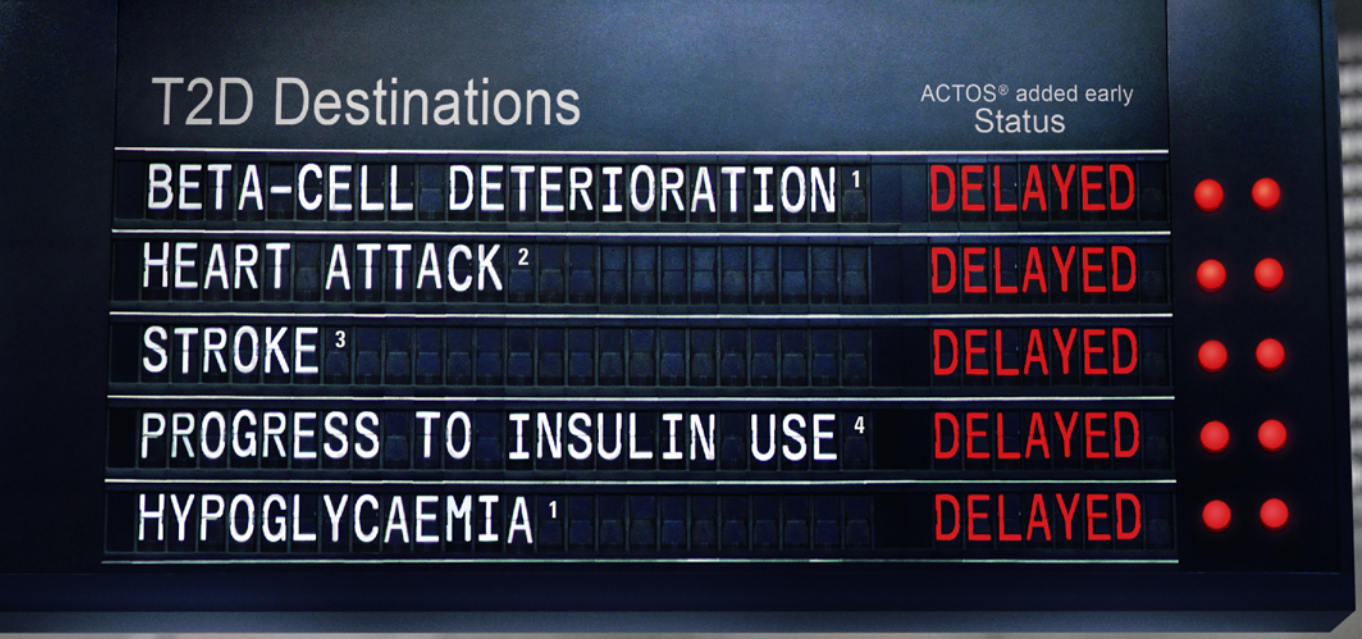
(Effective from October 2009)

Venue or Meeting Facilities	Member Society (Hourly Rate HK$)			Non-Member Society (Hourly Rate HK$)		
	Peak Hour	Non-Peak Hour	All day Sats, Suns & Public Holidays	Peak Hour	Non-Peak Hour	All day Sats, Suns & Public Holidays
Multifunction Room I *(Max 15 persons)*	150.00	105.00	225.00	250.00	175.00	375.00
Council Chamber *(Max 20 persons)*	240.00	168.00	360.00	400.00	280.00	600.00
Lecture Hall *(Max 100 persons)*	300.00	210.00	450.00	500.00	350.00	750.00
Non-Peak Hour: 9.30 am - 5.30 pm Peak Hour: 5.30pm - 10.30pm						
LCD Projector	500.00 per session					
Microphone System	50.00 per hour, minimum 2 hours					



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Chinese Jade Culture: Warring States to Qing

Dr. Patrick Tak-him KO

M.D. (Alberta), FRCPC, FHKCP, FHKAM (Med)
Specialist in Cardiology

Dr. Patrick Tak-him KO

In the "History of Ancient Chinese Jade Culture" that appeared in Vol. 13 No. 1 January 2008, I have described jade as an integral part of Chinese Culture. In a unique manner, Chinese jade reflects many Chinese beliefs and values. In the article, jade is arbitrarily divided into:

1.The Period of Myth and Magic: 4000 B.C. to 2000 B.C.,

- Hong Shan Culture	紅山文化
- Liang Zhu Culture	良渚文化
- Long Shan Culture	龍山文化

2.The Period of Development and Order: 2000 B.C. to A.D. 220

from	- Hsia, Shang, Zhou	夏商周
to	- Eastern Han	東漢

This was followed by an interim or transitional period, which can be regarded as the dark ages of jade culture from the Six Dynasties 六朝 to the Sui 隋 Dynasty: A.D. 221 to A.D. 618

3.The Period of Art: A.D. 618 to A.D. 1911 which began in Tang beginning A.D. 618 through Five Dynasties, Song, Yuan, Ming, Qing ending in A.D. 1911.

In the present article, I shall continue to introduce Chinese Jade from the Warring States Period to Qing. During the Warring States Period from 475 B.C. to 221 B.C., jade developed at a rapid pace, and flourished in craftsmanship and in quantity, as evidenced by the huge number of exquisitely crafted jade artefacts of this period excavated from thousands of tombs all over China, especially in the State of Chu 楚 in present day Hunan 湖南 , Hubei 湖北 , Henan 河南 etc.

The double dragon and phoenix as shown in **Figure 1** is an unusually large (26 cm wide) jade plaque of the Warring States Period. One can appreciate the typical grain pattern (representing the all important cereals 穀粒紋 found in many jade artefacts of the period, along with the dragon 龍 and phoenix 鳳 . The carving is focused on power or forcefulness as if expressing the military might of the Warring States, rendering the animals icons of nobility and authority. **Figure 2** is a pendant of Hotan 和田 white jade of superior quality, showing a taotie (a tiger-looking beast with ferocious appetite)饕餮 with its awe-inspiring and dynamic features so characteristic of the Warring States Period. This "taotie" has become an important icon since the Warring States Period, and is seen even to this date. A number of restaurants in Hong Kong Central use this "taotie" design as their company logo.

Figure 1

Figure 2

Figure 3

Western Han (202 B.C.-A.D. 8) jade objects are basically the continuum of the Western States Period in style with minor variations in form and with increasing varieties. **Figure 3** shows a bi-disc with finely crafted cereal grain pattern. On top of the bi-disc, two dragons are depicted

to rise up to the sky. The cereal grain pattern represents an abundance of harvest, which should bring about harmony in society. The two dragons rising to the sky 負龍升天 (perhaps in after-life) represents the religious belief of people of the Han Dynasty. The aspiration for eternal life is thus evident in this Western Han jade decorative plaque. The combination of the grain pattern in the bi-disc below, and the heavenly ascent of the dragons represent the keen desire of people in the Western Han, trying to strike a balance between earthly and cosmic order, via achieving harmony with nature. Such was the religious belief of Daoism during the early Han even though Buddhism, a foreign religion, was about to come into China from India.

During the peak of the Western Han, Han Wu-Di 漢武帝 personally favoured Confucianism, and that the teachings of Confucius would be able to set the standard for individual behaviour and social order. The emperor, himself probably had his own agenda by adopting Confucianism as stability of his large kingdom could thus be reassured.

Even in the Han jade culture, we can see a subtle interplay between Daoism, Buddhism and Confucianism. Many customs and beliefs, such as ancestral worship, the keen search for eternal life, and loyalty to one's seniors emerged in the Han Dynasty, have been handed down through for the last two centuries, and are still practised and widely seen today.

Figure 4 shows a beautifully designed and crafted jade box, the top and the bottom halves fitting each other perfectly. It is probably a container for precious herbal pills or other valuables. A neatly designed handle allows easy lifting of the top cover of this box.

Figure 4

Figure 5 is a jade cup with the characteristic "paired grain" pattern 拖手穀粒 i.e. each pair of volute-like grain linking with the next pair. The king and nobles who were rich enough to possess such an expensive piece of jade artwork were coaxed to drink morning dewdrops collected in such jade cups, sometimes along with jade powder, in order to obtain eternal life. Ge Hung, a Daoist alchemist and herbal doctor of East Han 東漢葛洪 (抱朴子) was a keen advocate of such theory. **Figure 6** is a rare but highly interesting piece of jade sculpture showing two Eastern Han men performing a juggling act, while dancing with a snake.

The West and East Han dynasties lasted four centuries from 202 B.C. - A.D. 220, and was followed by Wei-Jin 魏晉 and North-South 南北朝, A.D. 221 to A.D. 581. China was divided, and wars among feudal lords were frequent. It can be said that the development of jade probably halted, or actually declined compared to the Warring States Period and Han. No progress was made during this so-called dark age of jade in China. **Figure 7** is a jade Bi-Xie 玉辟邪, a winged animal, popularly believed to be able to ward off the evil spirits. It is arguable that such a jade artefact looks too good for Wei-Jin jade, and is more like a Han piece of jade artwork.

Figure 5

Figure 6

Figure 7

Sui and Tang did not produce many jade artefacts, perhaps because tri-colour pottery 唐三彩, and gold/silver artefacts prevailed and flourished. The earlier ritual and mythical animals gradually gave way to realistic and secular objects. **Figure 8** shows two jade plaques (out of sixteen making up a jade belt) that are typical of the Tang Dynasty. On the left is what appears to be a man from the Middle East blowing a "Sung" 笙. On the right is a man holding a lamp. The carving of linear, parallel lines is typical of Tang jade craftsmanship. The boots worn by human figures in the plaques suggest a foreign origin, say the Middle East 胡人服裝.

Figure 8

From Song to Yuan 宋元 (A.D. 960-1279 and 1279-1368), jade articles became even more secular and realistic reflecting customs or daily life of the era. **Figure 9** shows a boy holding a lotus, and wears a pair of loose trousers and a vest and this jade artwork reflects the social life of the Song Dynasty. Other Song jades are sculptures of animals, as is this realistically crafted jade dog shown in **Figure 10**. **Figure 11** and **12** are jade artworks, showing spring activities with large birds coming to life during early spring 春水 in the former, and in figure 12, a couple of deers are seen grazing in the bush 秋山 . Such were familiar sights in the Northern parts of China during the Yuan-Liao-Jin 元遼金 period.

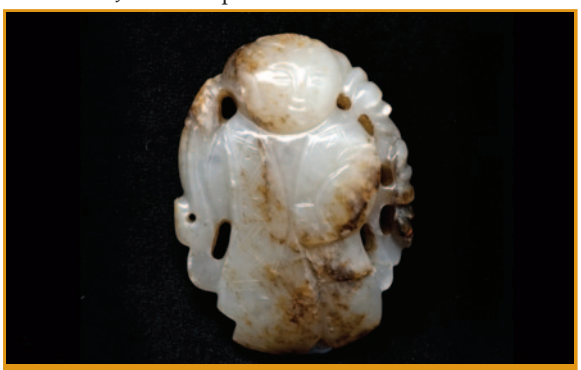

Figure 9

Figure 10

Figure 11

Figure 12

Ming (AD1368-1644) jade articles are not known for superiority in craftsmanship, and the quality of the jade stone itself is often mediocre. Indeed, many Ming jades have been criticised as suboptimal 明大粗 in carving technique. I would like to show just one in **Figure 13** showing 3 (out of 20 forming a jade belt) jade plaques with an open work coiled dragon design so typical of Ming Dynasty work of the 16th century.

Figure 13

Jade flourished in the Qing Dynasty (AD1644-1911) during the early Qian Long 乾隆 Reign. Jade pendants for well-wishing and ornamental purposes became very popular, especially among the literati (or those aspiring to be one). Many of these bore the inscription of Zigang 子岡, a master jade craftsman who lived in the late Ming Dynasty, often with poetic verses "signed" by the master on one side. One such example is found in **Figure 14**. Another example of Qing jade is a snuff box 鼻烟壺 **Figure 15** made of white jade of superior quality, and was highly popular among the rich and noble. Qing Dynasty jades are usually of high quality and craftsmanship and hence much sought after by many collectors even today. However I personally prefer ancient jade objects from Neolithic (Hong Shan, Liang Zhu and Long Shan), Shang-Zhou to Warring States-Han because of their historical, esthetic and artistic values.

Figure 14

Figure 15

It has been a pleasure writing this introduction on the history of Chinese jade, as a follow-up to my article two years ago for the Lifestyle Section of the Federation of Medical Societies' Medical Diary. It has given me the opportunity to write on jade culture. Just like writing up a review on a medical subject, the writer is usually the one ending up learning and benefiting the most.

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Society News

News from Member Societies

1. **Hong Kong Orthoptists Association**
   Updated office-bearers for the year 2010-2011 are as follows: President: Ms. Wai-ling CHIU; Honorary Secretary: Ms. Sarah Suet-wah WONG; Honorary Treasurer: Ms. Chi-shan TSANG

2. **Hong Kong Society for Paediatric Immunology and Infectious Diseases**
   Updated office-bearers for the year 2010-2012 are as follows: President: Dr. C.W. LEUNG; Honorary Secretary: Dr. Marco HO; Honorary Treasurer: Dr. Y.S. YAU

3. **Hong Kong Society for the Study of Thalassaemia**
   Updated office-bearers for the year 2010-2011 are as follows: President: Prof. Godfrey Chi-fung CHAN; Honorary Secretary: Dr. Jason SO; Honorary Treasurer: Dr. Edmond MA

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   Updated office-bearers for the year 2010-2011 are as follows: President: Dr. Chi-bon LEUNG; Honorary Secretary: Dr. Samuel Ka-shun FUNG; Honorary Treasurer: Dr. Andrew Koon-shing CHOI

The FMSHK would like to send its congratulations to the new office-bearers and look forward to working together with the societies.

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Date	Course No	Course Name	Target Participants	CME/CNE
6 Jan – 27 Jan 2011	C171	催眠治療臨床應用課程(基礎訓練)	Medical & Health Professionals	10 CNE points ; CME/CPD Accreditation in Application
18 Feb – 25 Mar 2011	C174	Dental Nursing in Oral Surgery	Dental Nurses	9 CNE points ; CME/CPD Accreditation in Application

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* HKMA Certificate Course on Family Medicine 2011 9	* A Patient with Severe Loin Pain 10	* FMSHK Officers' Meeting 11	* Hong Kong Neurosurgical Society Monthly Academic Meeting – Ventricular catherization * HKMA Central, Western & Southern Community Network – Latest Management of GERD 12	* HKMA Structured CME Programme with Hong Kong Sanatorium & Hospital Year 2011 – The Use of Hysteroscopy in Gynaecology * Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 2) 13	14	15
16	17	* FMSHK Executive Committee Meeting 18	19	* Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 3) 20	21	* 6th HKMA Sports Night 22
23	24	25	26	* Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 4) * HKFMS Foundation Meeting 27	28	29
30	31					

Date / Time	Function	Enquiry / Remarks
4 TUE 8:00pm	**HKMA Council Meeting** Organiser: The Hong Kong Medical Association, Chairman: Dr. K Choi, Venue: HKMA Head Office (5/F., Duke of Windsor Social Service Building, 15 Hennessy Road, Hong Kong)	Ms. Christine WONG Tel: 2527 8285
6 THU 2:00pm	**Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 1)** Organiser: HKMA Beat Drugs Action Committee & HKMA New Territories West Community Network, Speaker: Dr. CHEUNG Kin Leung, Ben; Dr. LEE Wing King, Venue: Auditorium, Pok Oi Hospital, Yuen Long, N.T.	Miss Queenie LAM Tel: 2527 8285 CME Accreditation in Application
7 FRI 8:00am - 9:00 am	**Joint Surgical Symposium - Recurrent Hepatocellular Carcinoma** Organiser: Department of Surgery, The University of Hong Kong & Hong Kong Sanatorium & Hospital, Chairman: Dr. Angus CW Chan, Speaker: Dr. CHAN See-Ching, Dr. Albert CHAN, Venue: Hong Kong Sanatorium & Hospital	Department of Surgery, Hong Kong Sanatorium & Hospital Tel: 2835 8698 Fax: 2892 7511 1 CME Point
8 SAT 2:30 pm	**Refresher Course for Health Care Providers 2010/2011** Organiser: The Hong Kong Medical Association, Speaker: Dr. TO Hing Ting, Venue: OLMH	Ms. Clara Tsang Tel: 2354 2440 2 CME Points
9 SUN 2:00pm	**HKMA Certificate Course on Family Medicine 2011** Organiser: The Hong Kong Medical Association, Speaker: Dr. LAM Chun Lit; Dr. FUNG Tang Tat, Venue: QEH	Miss Viviane LAM Tel: 2527 8452 3 CME Points
10 MON 7:30pm - 8:30 pm	**A Patient with Severe Loin Pain** Organiser: Hong Kong Urological Association,Chairman: Dr CHAU Hin Lysander (Associate Consultant), Speaker: Dr CHAN Hoi Chak (Resident), Venue: Seminar Room, G/F., Block A, QEH	Dr HUNG Hing Hoi / Ms Tammy HUNG Tel:2958 6006 / 9609 6064 Fax:2958 6076 / 8344 5115 1 CME Point (The college of Surgeons of Hong Kong)
11 TUE 8:00pm	**FMSHK Officers' Meeting** Organiser: The Federation of Medical Societies of Hong Kong, Venue: Gallop, 2/F., Hong Kong Jockey Club Club House, Shan Kwong Road, Happy valley, Hong Kong	Ms. Sonia CHEUNG Tel: 2527 8898 Fax: 2865 0345
12 WED 7:30 am	**Hong Kong Neurosurgical Society Monthly Academic Meeting – Ventricular catherization** Organiser: Hong Kong Neurosurgical Society, Chairman: Dr. Wilson HO, Speaker: Dr. Lai-Fung LI, Venue: Seminar Room, Ground Floor, Block A, Queen Elizabeth Hospital	Dr. Gilberto LEUNG Tel: 2255 3368 Fax:2818 4350 1 CME Point (College of Surgeons of Hong Kong)
1:00pm	**HKMA Central, Western & Southern Community Network – Latest Management of GERD** Organiser: HKMA Central, Western & Southern Community Network, Chairman:TBC, Speaker: Prof. WONG Chun Yu, Benjamin, Venue: The HKMA Dr. Li Shu Pui Professional Education Centre, 2/F, Chinese Club Building, 21-22 Connaught Road Central, Hong Kong	Miss Carman WONG Tel: 2527 8285 1 CME Point
13 THU 2:00pm	**HKMA Structured CME Programme with Hong Kong Sanatorium & Hospital Year 2011 – The Use of Hysteroscopy in Gynaecology** Organiser: The Hong Kong Medical Association, Speaker: Dr. YUEN Pong Mo, Venue: The HKMA Dr. Li Shu Pui Professional Education Centre, 2/F, Chinese Club Building, 21-22 Connaught Road Central, Hong Kong	Miss Viviane LAM Tel: 2527 8452 1 CME Point
2:00pm	**Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 2)** Organiser: HKMA Beat Drugs Action Committee & HKMA New Territories West Community Network, Speaker: Dr. LAI Cing Hon, Jeffrey; Dr. FUNG Hin Tat, Jeffrey, Venue: 9/F, 9S2&3, Pok Oi Hospital, Yuen Long, N.T.	Miss Queenie LAM Tel: 2527 8285 CME Accreditation in Application
18 TUE 8:00pm	**FMSHK Executive Committee Meeting** Organiser: The Federation of Medical Societies of Hong Kong, Venue: Council Chamber, 4/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong	Ms. Sonia CHEUNG Tel: 2527 8898 Fax: 2865 0345
20 THU 2:00pm	**Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 3)** Organiser: HKMA Beat Drugs Action Committee & HKMA New Territories West Community Network, Speaker: Dr. CHU Sau Kwan, Peggy; Prof. LEE Wing Ho, Peter, Venue: Auditorium, Pok Oi Hospital, Yuen Long, N.T.	Miss Queenie LAM Tel: 2527 8285 CME Accreditation in Application
22 SAT 7:00 pm	**6th HKMA Sports Night** Organiser: The Hong Kong Medical Association, Venue: Wan Chai Ho Choi Banquet and Seafood Restaurant - The Grand Hall	Miss Candice TONG Tel: 2527 8285
27 THU 2:00pm	**Certificate Course on Management of Drug Abuse Patients for Family Doctors (Session 4)** Organiser: HKMA Beat Drugs Action Committee & HKMA New Territories West Community Network, Speaker: Dr. CHEUNG Wai Him, Venue: Auditorium, Pok Oi Hospital, Yuen Long, N.T.	Miss Queenie LAM Tel: 2527 8285 CME Accreditation in Application
8:00pm	**HKFMS Foundation Meeting** Organiser: The Federation of Medical Societies of Hong Kong, Venue: Council Chamber, 4/F, Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong	Ms. Sonia CHEUNG Tel: 2527 8898 Fax: 2865 0345

Courses / Meetings

08/02 - 19/04/2011	**Certificate Course in Clinical Audit (Code No. TC-CA-II-01)** Organisation: College of Nursing Hong Kong, Tel : 2572 9255, CNE/PEM Points awarded: 24
15/02 - 19/04/2011	**Certificate Course - Ward Management Module III Managing Risk at Workplace (Risk Management) (Code No. TC-WM-III-II-01)** Organisation: College of Nursing Hong Kong, Tel : 2572 9255, CNE/PEM Points awarded: 24
17/02 - 18/02/2011	**Economist Conferences: Healthcare in Asia 2011** Organisation: The Economist Group, Venue: Harbour Grand Kowloon Hong Kong, Enquiry: Catherine Tong (Brand & Communications Executive Group), Tel: 2585 3826, Email: catherinetong@economist.com
24/02 - 26/02/2011	**International Colorectal Disease Symposium 2011** Organisation: Minimal Access Surgery Training Centre & Hong Kong Society for Coloproctology, Venue: HKEC Training Centre for Healthcare Management and Clinical Technology, Location: Pamela Youde Nethersole Eastern Hospital, 3 Lok Man Road, Chai Wan, Hong Kong, Tel: 2595 6362, Fax: 2505 7101, Email: info@icds-hk.org

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NAXOS FOUNDATION PRESENTS

西崎崇子情人節音樂會

TAKAKO NISHIZAKI VALENTINE CONCERT

西崎崇子，小提琴
香港城市室樂團
彼得．拜拿，指揮及鋼琴
TAKAKO NISHIZAKI, VIOLIN
CITY CHAMBER ORCHESTRA OF HONG KONG
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西崎崇子

西崎崇子自幼從父學習小提琴，父親西崎信二與鈴木進一是「鈴木教學法」的共同創始人。她是首名學生完成享譽盛名的鈴木課程，並早在九歲時就獲頒授教師學位證書。西崎崇子期後以獎學金進入茱莉亞音樂學院隨JOSEPH FUCHS研習，期間更獲克賴斯勒基金會獎學金。

西崎崇子曾與多個世界頂尖樂團攜手，包括悉尼交響樂團、墨爾本交響樂團、新西蘭交響樂團、北京中央交響樂團、上海交響樂團、波蘭國家廣播交響樂團、莫斯科交響樂團、烏克蘭國家交響樂團、斯洛伐克愛樂交響樂團、國立里爾管弦樂團（法國）、香港管弦樂團、新加坡交響樂團及美國和日本的多個樂團。

西崎崇子於2001年獲奧地利共和國頒授金獎，以讚揚她在音樂尤其是奧地利音樂的貢獻。2003年，她獲香港政府頒授銅紫荊星章，表揚她對音樂及社會服務的貢獻。2005年，她獲日本新聞周刊選為全球一百名最受尊崇的日本人。

西崎崇子一直是灌錄最多唱片和唱片最暢銷的小提琴家之一。她灌錄的韋華第《四季》銷量突破一百萬張，仍高據古典音樂唱片暢銷榜第八位。她為拿索斯唱片公司灌錄的唱片還有莫扎特(包括《哈夫納小夜曲》)、貝多芬、巴哈和柴可夫斯基全套為小提琴與樂隊而寫的作品，以及布拉姆斯、布魯赫和孟德爾頌的協奏曲。由她演繹陳鋼和何占豪的**《梁祝協奏曲》**，在中華人民共和國和東南亞唱片銷量超過三百萬張。2009年西崎崇子參與了為紀念**《梁祝》**協奏曲於1959年首演五十周年的音樂會，她是當晚唯一一位非華裔演奏家演出這首經典名作。音樂會在北京人民大會堂舉行，並由中央電視台及上海電視台作全國電視廣播。

2008年4月西崎崇子實現她一直以來的夢想，親自將國際知名「鈴木教學法小提琴教材」第一至八冊內的所有曲目，灌錄成**《鈴木名曲系列》**唱片專輯。她希望藉此進一步保存她父親西崎信二與鈴木進一博士共同創立的教學方法，並寄望新一代小提琴家和小提琴老師繼續採用「鈴木教學法」，將這套優良教學法一直承傳下去。

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西崎崇子在香港開辦了西崎崇子音樂教室，由她親自授課或從旁指導，教學模式揉合了鈴木教學法的精髓和傳統教法。

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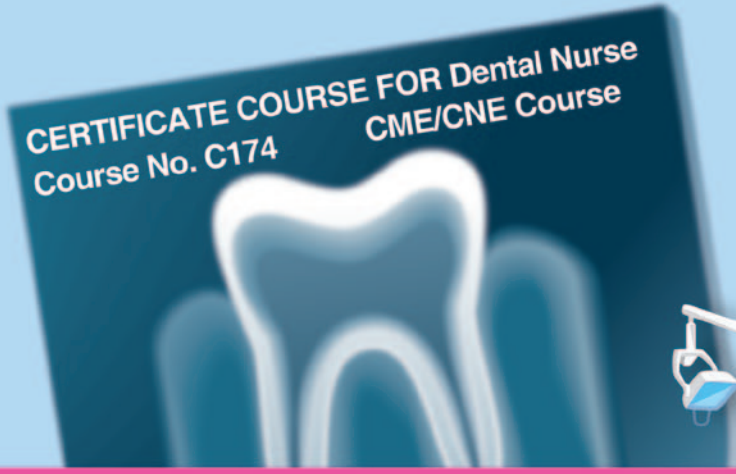

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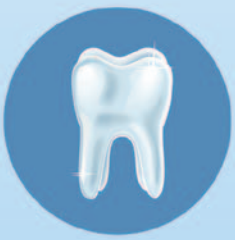

Date	Topics	Speakers
18 Feb 2011	Common Oral Diseases and Oral & Maxillofacial Surgery	Dr. Ken Wai-Kuen CHIU Specialist, Oral and Maxillofacial Surgery Private Practice
25 Feb 2011	Minor Oral Surgery in Dental Office	Dr. Julianna Cho-Hwei LIEW Specialist , Oral and Maxillofacial Surgery Dental Officer, Oral Maxillofacial and Dental Unit Queen Mary Hospital
4 Mar 2011	Dental Implant Surgery in Dental Office	Dr. Raymond Lop-Keung CHOW Specialist, Oral and Maxillofacial Surgery Private Practice
11 Mar 2011	Peri-Operative Nursing in Dental Office	Ms. Julie Suk-Lin CHOW Ward Manager, Operation Theatre Services Department Queen Mary Hospital Ms. Rose Wai-Yee WONG Advanced Practice Nurse, Operation Theatre Services Department Queen Mary Hospital Ms. Charles Yu-Ning LAW Enrolled Nurse, Operation Theatre Services Department Queen Mary Hospital
18 Mar 2011	Sedation in Dental Office	Dr. Chi-Wai CHEUNG Specialist , Anaesthesiologist / Clinical Assistant Professor, Department of Anaesthesiology The University of Hong Kong
25 Mar 2011	Medical Emergency in Dental Office	Dr. Alfred Sze-Lok LAU Specialist, Oral and Maxillofacial Surgery Private Practice

Time	7:00 p.m. – 8:30 p.m.
Venue	Lecture Hall, 4/F., Duke of Windsor Social Service Building, 15 Hennessy Road, Wanchai, Hong Kong
Language Media	Cantonese (Supplemented with English)
Course Fee	HK$750 (6 sessions)
Certificate	Awarded to participants with a minimum attendance of 70%
Enquiry	The Secretariat of The Federation of Medical Societies of Hong Kong Tel.: 2527 8898 Fax: 2865 0345 Email: info@fmshk.org

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Reference : 1. Grundy SM. et al. Implications of Recent Clinical Trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Circulation 2004; 110:227-239

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