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A journey in Interventional Cardiology in South Africa in 2015

A collection of articles written and cases selected by

Professor Jean Marco, MD,

Invited Professor in South Africa by SASCI from
20 March to 28 May 2015

At the occasion of AfricaPCR 2015

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March
20th

Interventional cardiology in South Africa: Chris Hani Baragwanath Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa. First stop: the Chris Hani Baragwanath Hospital, one of the three biggest hospitals in the world.

By Jean Marco, MD, PhD, Interventional cardiologist

Monday morning, Journal Club: off to a good start!

Monday, 8 - 9.30 am: «Journal Club», All Seniors and Fellows present! Four fellows reported the content of a new published paper, and open-minded discussion, comments on the content and potential application in daily practice in the hospital, taking into consideration their patients' particularities and local constraints.

Discussion about TAVI

The mean age in reported registries: 84 years! Discordance with the population of patients admitted in this Hospital. Few elderly patients with degenerative aortic stenosis, age < 70 years old! Interesting discussion on mitral valve regurgitation associated with aortic stenosis and potentiality impact on the surgery strategy for such patients.

9.30: visit to the Emergency Ward admissions: 150 to 200 urgent admissions/day! All pathologies.

Visit to the Coronary Cardiac Unit: 10 beds, young patients with difficult cardiac pathologies and multi comorbidities (HIV is a major concern, with 3 females, around 50 years old presenting with ACS. Probably new disease related to positive retrovirus?)

Patients with acute coronary syndromes are young patients

STEMI patients admitted in centres or other units (Emergency Unit) and treated with fibrinolysis then transferred post-fibrinolysis! We had good exchanges on the management strategy for such patients! We have to take this point into consideration when building PCR Sessions on STEMI. In SA, fibrinolysis followed by transfer 24 hours later in centre with PCI capability (Like in other countries... Gulf... and others) is probably an option to increase the number of patients with myocardial reperfusion... the study published by Armstrong Lancet 2013 is in favour of this strategy!

Pr. Essop and a group of Seniors are doing a great job in education/training, probably the best I experienced in different hospitals I have visited in the past: they really stimulate fellows to expose what they have done in detail, no shame, and express their point of view. They press the group of fellows to controversial opinions, pro-contra and synthesis, and reference to the most appropriate knowledge! «Making thinking visible», and developing logical clinical reasoning, even facing with difficult clinical situations and multiple difficulties!

Jean Marco with cardiology fellows at Baragwanath Hospital, Soweto



The group of 6 fellows includes:

James from Rwanda, Wive Mtwesi from SA, Mohamed from Libia, Mpno from SA, Alosa Singh, SA, Farim Dube from Zimbabwe with experience in Cardiology from 15 months to 3 months.

I am impressed by the quality of the training/learning: Professor Essop and Seniors.

Fellows are learning by doing and reflecting on their actions! No criticism, and focusing in the reasoning, clearly oriented

for each patient to particularities, appraisal of all clinical aspects. Huge culture in general pathologies and internal medicine.

Only one cathlab (good quality of RX equipment- Phillips, with excellent image)

From Monday to Wednesday



Coronary angiography performed in patients presenting with Acute Coronary syndromes: STEMI post-fibrinolysis, or late presentation or «high-risk» NSTEMI.

For each case, open-minded discussion and consensus between a senior and fellows. Fellows are doing, following comments or recommendations under constant senior control. Good expertise.

Discussions on the best strategy for patients undergoing coronary angiogram 2-3 days after fibrinolysis taking into consideration the major issue: difficulties to postpone a decision, to follow the patient when discharged, and try to do the best during the index hospitalisation.

An example of difficult situation they are facing: a lady admitted for NSTEMI, recurrent episode of angina and ST changes despite optimal treatment. OM long lesion and very complex diffuse RCA. After sharing the different options, they perform a complex anatomy reconstruction! It was the best solution, as the surgical option requires to wait for at least six months!

Monday-Wednesday afternoons, meeting with fellows

Fellows-classroom-Baragwanath

90-minute interactive exchanges around the topic «Management of a patient presenting with «high-risk» acute coronary syndromes: antithrombotic, risk of stent thrombosis, practical step-by-step approach. For each of the points discussed, comments on cases performed in the cathlab the same day or one day before (including sub-acute stent thrombosis...real life!... analysis of the potential causes... how to treat... what we learn from this case... how this experience could impact on our practice... the point of issue: undersized or under-deployed stent in thrombus containing lesions...this is probably one point that could be discussed more in detail during PCR Sessions... the educative material from PCR (Online-

Sharing Centre- PCR Seminar-LITB) allows me to illustrate most OF the key issues.... We should review all that could help the community by facilitating the research of examples illustrating daily practice difficulties.

This group of fellows «wants to learn». Each practical comment is noted...commented...converted into a «practical message» to be retained for application in daily practice! They know the published paper... using easily smartphone or tablet!... We have to focus on the reasoning linked with a practical situation.

They appreciate the learning guides and the step-by-step approach, by using a checklist process!....

My experience in the Echocardio lab (twice): outpatient, pregnant (27 weeks) presenting with severe mitral stenosis requiring balloon dilatation... successfully done one day later!... Tuberculosis pericarditis....with impressive pictures...

30-year old gentleman, very poor condition, severe septic multiple vegetations on tricuspid valve + pulmonary valve vegetation+ multiple embolism...impressive Chest Rx pictures! Severe tricuspid vegetation...a unique experience for me....but «routine» in this hospital: there is a similar 20-year-old patient in the coronary care unit.

Wednesday evening: SASCI meeting with interventional cardiologists and nurses/allied professionals

Topic: sharing experience and knowledge on STEMI

I prepared some cases directly linked with the cases discussed in the hospital: 24 hours or 3 days post fibrinolysis, how to manage patients? How to deal with open vessel, TIMI 3 flow, and moderate even significant lesions? Primary PCI : which anti-thrombotic preparation or adjunctive therapy according to patient's presentation? Thrombus aspiration or not? To whom? For how long DAPT? How to built the reasoning and decision-making in patients with oral anticoagulant requiring PCI and receiving stents? Practical discussion on personalised medicine: all participants know the trials results... and Guidelines... the questions were 'individual patient-oriented'!

All the questions: practical, how to manage difficulties, how to resolve...no questions on Guideline or recent studies... TOTAL they know. Only practical-oriented exchanges and different points of view were exchanged with key messages...for particular patient...presenting in their institutions.. with the local constraints...

Personalised medicine in their hospital!...

I understand the difference between public and private hospital practice.

Friday: planned lecture for the Internal Medicine Department: A better understanding on trials may help to improve professional proficiency!...Another story...

19th March, morning: Consultation office, Cardiomyopathy Clinic with Pr. Richard Nethnida

A great doctor (knows how to address patients in a human manner), a great teacher and very knowledgeable.

Small offices with echo machine, taking time to exchange with a very human attitude with all patients, about their life...and patients with...sarcoidosis, post-heart transplant, pericarditis... specific hypertension with hypertrophic cardiomyopathy... Pseudoxanthoma Elasticum...collagen disease and aortic dilatation...

Later, exchanges on echo data...Young patients ...post rheumatical severe mitral regurgitation added to rheumatical tricuspid regurgitation... and depressed left ventricular function!... Which strategy?

Lunch and free exchanges with fellows. They have requested as topic for the next exchange 'How to prepare and deliver an effective educational lecture by using PowerPoint'.

For 90 minutes... great exchanges...they understood the process....not only to prepare a lecture... but how to reflect on knowledge...what is the question...what is the problem....why it is important... how to...when? ...plus... minus...interesting...are key to manage each individual patient in taking into account particularities...reflection on knowledge and not copy paste...what is essential to memorise...versus non-essential and interesting!...and simple!

Really I am in love with this small group of fellows!

20th March

Understanding the essential behind the strength and weakness of data is a way to improve our reasoning, decision-making process and so our professional proficiency... with all the fellows of the Internal Medicine Department and OF course my «great group»

8 am: Meeting with all the team members, review and discussion on the patients with controversial treatment options (Pr. Essop, Chris Zambakides, Farai Dube, James Nkurunziza, Leodegard Mujwahuzi, Muhammad Zaid Moosa, Rofhiwa Mathisa, Mohamed Alteer, Alosa Singh, Mtswesi Viwe...)

First part: review of the patients presenting in the CCU with 'High-risk' acute coronary syndromes.

9.30 - 11 am : second part of the team discussion dedicated to patients with valvular disease requiring surgery repair or replacement

In this session, 7 cases were discussed!

- 3 patients < 65 y.o. with severe aortic disease, candidate for valve replacement, no candidate for TAVI
- 22 y.o. male with severe mitral regurgitation
- 48 y.o. lady with mitral stenosis and severe aortic regurgitation,
- 27 y.o lady with severe aortic regurgitation and mitral post mitral valve repair, atrial fibrillation EF 35%,

- 20, y.o. male, HIV positive, endocarditis, severe tricuspid, and mitral vegetation, + multiple septic pulmonary embolism tricuspid + tricuspid and a post rheumatical
- And so....

11 - 12 am: visit to the CCU.... New fascinating patients... HIV positive plus complex valvular disease! Post-endocarditis on pulmonary valve + VSD!... CAD in young females who are HIV positive and show multiples comorbidities....very complex and severe patients!...

Excellent exchanges between professor and fellows! Great learning experience! Review of some patients investigated by 2D-3D Echocardiogram. Fascinating..

I am learning... like a fellow, and from the fellows and by sharing!

Currently we do not see such patients in Europe! Maybe in the future we will have to face with such complex pathologies.... And right heart endocarditis, with the increased issue of drug addicts... we have to learn from our friends from South Africa

Lecture in the Department of Internal Medicine 'Sharing our knowledge on the essentials on clinical trials to enhance our professional proficiency'

1.30 - 2.30 pm:

Fellows, students, seniors and professors from different specialities. Good exchange on how trials are conducted and how to analyse and interpret results and data, and how to reflect on and integrate the essentials in our daily practice for an optimal decision-making process for each individual patient, in the light of local practice.

I strongly believe it is one of the roles of AfricaPCR and links with PCR Family... by and for... we have to listen, hear and understand.

My conclusion about these 5 days in the Chris Hani Baragawanath Hospital

I have been impressed by the quality of the learning-teaching processes and have learned a lot. There have been abundant exchanges with very kind healthcare professionals!

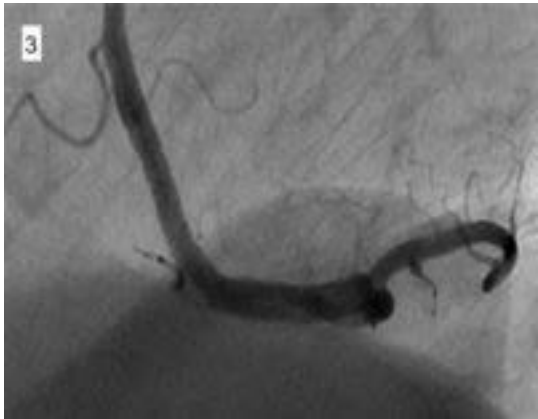
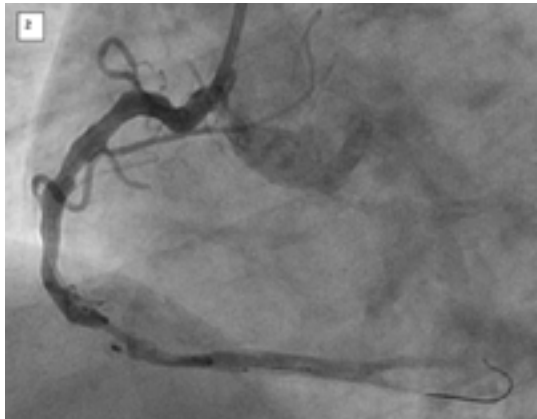
"The most appropriate management strategy for each individual patient and for the majority of patients, taking into consideration their particularities and in the light of local experience, reflection on evidence, local constraints!... economically sustainable health care priorities... for each country... for a large majority of patients... and not "selected patients".

Objective of personalised medicine: net benefit for each individual patient... and net benefit for society!...

Selected by Jean Marco MD, PhD, interventional cardiologist

Patient 1

A 62 year-old gentleman
Late presentation (48h) after inferior STEMI



Selected by Jean Marco MD, PhD, interventional cardiologist

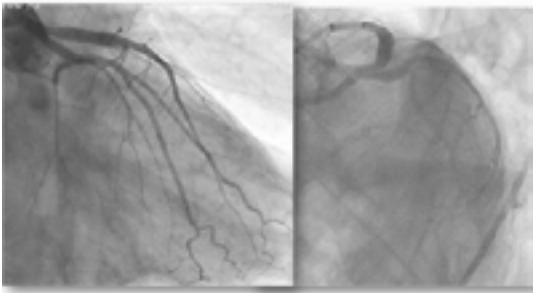
Patient 2

Patient 2

- A 64 year-old gentleman, anterior STEMI, admitted 4 hours after the onset of symptoms in emergency ward
- EKG: ST-Elevation, 4 mm in leads V2-V6
- **Streptokinase IV infusion** + ASA+ loading dose of Plavix
- 30' after streptokinase infusion: ST Elevation resolved no pain
- Transferred in the Chris Handi Baragawanah Hospital CCU - Symptom free, normal clinical exam, no ST elevation
- Echocardiogram: anterior hypokinesia, EF: 45%



48 hours after symptom onset

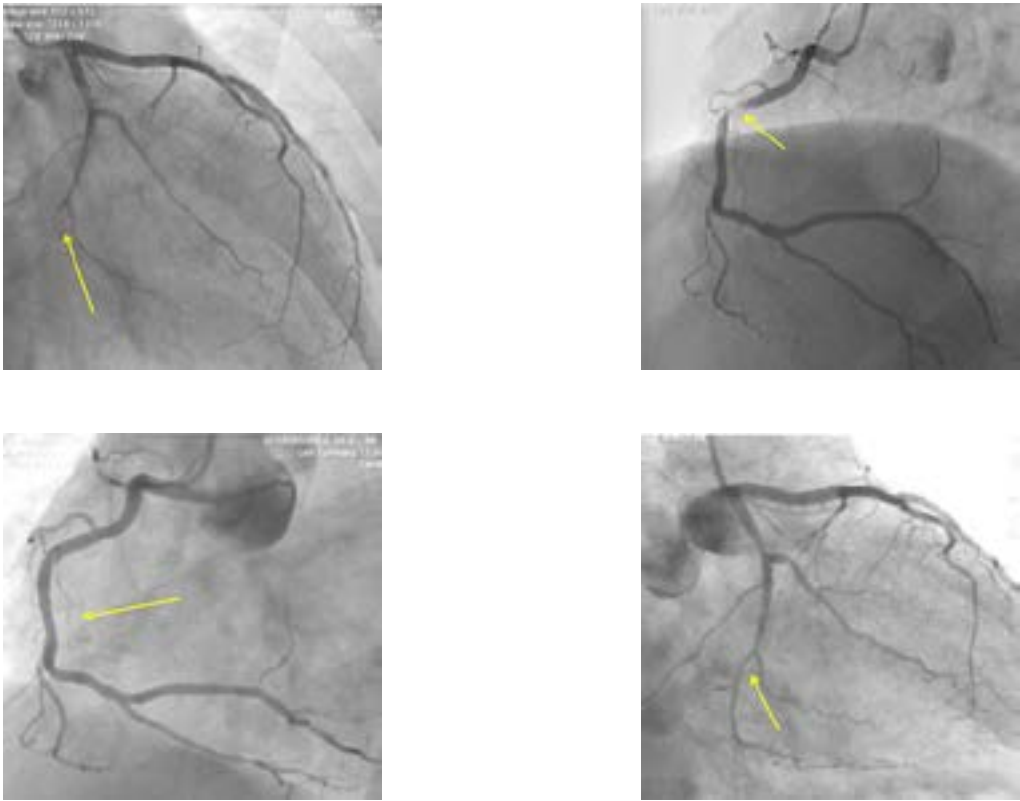


2 Post- stenting 3.5 x 15 mm DES
+ post dilatation

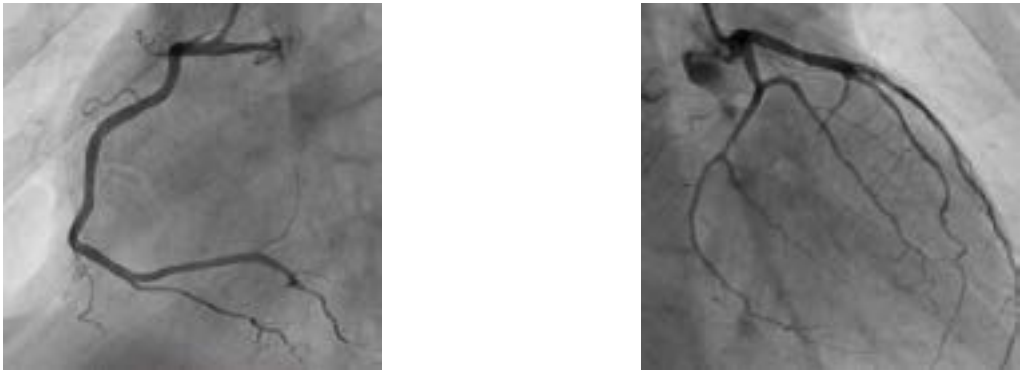
Selected by Jean Marco MD, PhD, interventional cardiologist

Patient 3

A 56 year-old gentleman - He was admitted 3 weeks ago with an infero-lateral STEMI
Coronary angiogram (see below)



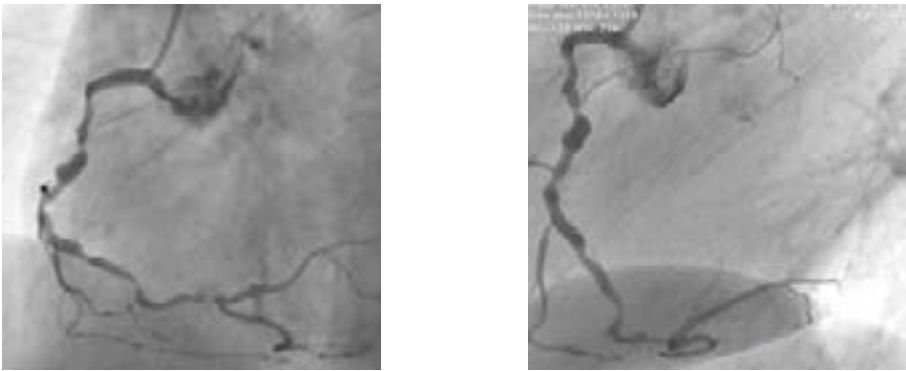
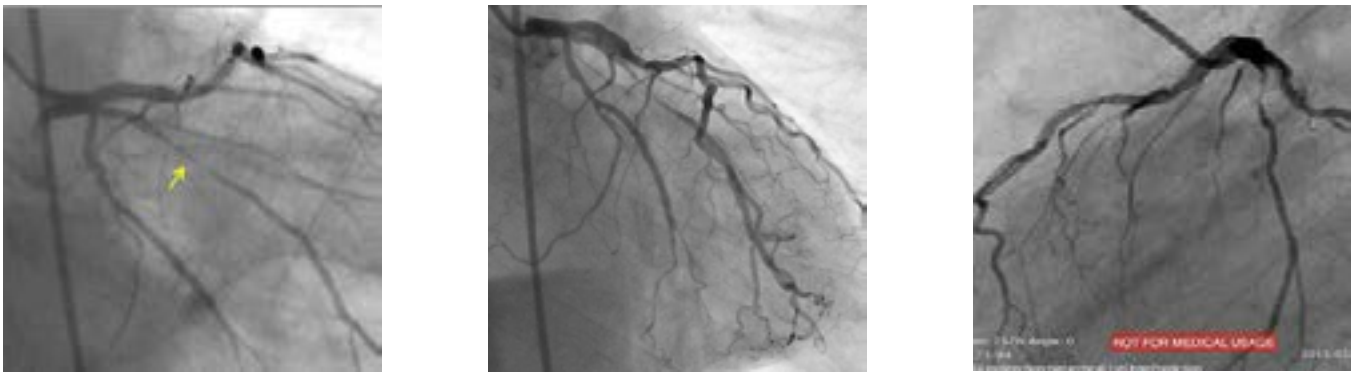
- Discharged one day later - He stopped Plavix two days later!
- New hospitalization at day 7 for 'pain, vomiting, haematemesis' and ECG changes
- Control angiogram



Selected by Jean Marco MD, PhD, interventional cardiologist

Patient 4

- A 53 year-old lady
- 3 weeks ago, she was admitted in CCU with a NSTEMI (Episodes of angina walking and at rest, ST depression > 2mm in leads D2-D3-aVF, troponin release)
- Clinical exam was normal
- EKG: SR, no Q wave
- Echo: inferior hypokinesia, EF:50%
- Plavix+ ASA+ LMWH +betablockers+nitrate



3 weeks later:

- Recurrent angina despite OMTx
- Re-admission
- CABG discussed: > 6 months waiting list!
- PCI decided



March
25th

Interventional cardiology in South Africa: Sunninghill Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa. Second stop: the Sunninghill Hospital in Johannesburg.

By Jean Marco, MD, PhD, interventional cardiologist

Johannesburg, 23rd March, 2015 - a great visit with Farrel Hellig

Farrel Hellig welcomes me very warmly, and gives me some of his precious time for the visit of this very great hospital.

The large, newly-built private hospital counts **300 beds**, is very spacious with reception, corridors, road signs.... perfectly organised, indicated for patients and visitors. All patients should have private insurance to cover the costs.

Coronary Cardiac Unit: 20 beds

Intensive Care Unit: 20 beds, mostly dedicated to heart disease but other complex patients with severe co-morbidities are also admitted.

Congenital Heart Disease Surgery: 40 beds: impressive, with babies coming for surgery from all around Africa!

See pictures 1-2 (7-month-old and a newborn):



Trauma Care Unit: 20 beds

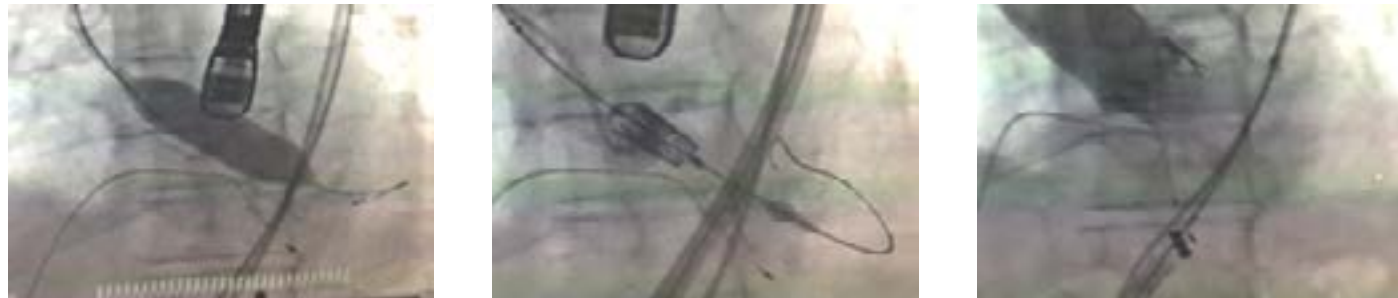
Large and very spacious Hemodynamic Units: currently 3 rooms (one dedicated to EP interventions-Siemens, 1 hybrid-surgical room -Phillips- for vascular interventions and TAVI, one biplane for complex Coronary or Structural Interventions -Siemens- fully and presently equipped with camera for broadcasting).

Another one –Siemens- is planned to be installed before the end of this year.

First procedure of the day: TAVI

This morning, 8am, a 90-year-old lady, small, very severe Aortic stenosis (0.3 cm², small and severely hyperopic LV ...TAVI performed quickly, percutaneous....)

See pictures 3-4-5:



Good recovery...at 10 am, the patient is smiling and speaking with humour!

TAVI procedures are performed routinely, experience around 100 patients.

Various complex interventions, coronary and structural are performed: LAA closures, PFO closures, ASD closures, and perivalvular linkage defect closure, complex CTO recanalization via retrograde approach.

I shared with Farrel some of the cases: severe paravalvular mitral leakage.



Second procedure: a patient with complex CTO

Today, a patient with complex CTO, 12 years after DES implantation, 2 failed recanalisation attempts.

Referred to Farrell this morning, who did a great job on this long, complex and very costly procedure (required 6 wires, 1 micro catheter, 2 balloon, 1 Cutting balloon and 2 DE balloons).

A great team, very well-trained and organised, the procedure was performed calmly... all team members in the room did great work.

CTO of the DE stent implanted 12 years ago on large diagonal, recanalisation...CTO of the two branches of the diagonal beyond the stent... results after the procedure... good results upon branches, sub-intimal dissection on the second branches, intervention for symptom purposes, large diagonal, LAD without

disease.

See pictures below:



A patient with high-risk N-STEMI

An 80-year-old lady, admitted for a “High-risk” NSTEMI, with a sepsis context and multiple comorbidities... after a few days of intensive therapy. See pictures 12 to 14 below:



Diffusely diseased RCA, occlusion of the mid LAD, ad hoc recanalisation of LAD with implantation of 2 long DES.

Farrel is really a great operator, working slowly and efficiently in a quiet atmosphere thanks to a well trained team of Nurses-Allied professionals.

My only concern is the very high cost of these complex procedures, and the real ratio of cost-risk/net benefit for these patients... But this is one of part of my thoughts when I see such complex PCI procedures at different hospitals.

It was a great opportunity to see a private hospital and have an overview of some differences in healthcare in South Africa.



Farrel Hellig in Sunninghill Hospital cathlab performing interventional cardiology procedure

Thank you Farrel for giving me the opportunity to share a part of your very busy working day!

Interventional Cardiology in South Africa: SASCI meeting

By Jean Marco, MD, PhD, interventional cardiologist

“Sharing experience and knowledge on STEMI” with Nurses & Allied Professionals and Cardiologists

Meeting at the South African Society of Cardiovascular Intervention (SASCI)

From Johannesburg to Pretoria...

5 pm: from Johannesburg to Pretoria, by car ... We discover what “*heavy traffic*” really means: 80 kms of traffic, four continuous lanes of cars!

Meeting well-organised by Sanette. Thank you!

Open-minded discussion, in a friendly atmosphere around the presentation of STEMI cases, some from France (provided by Thomas Cuisset for PCR Seminars), and some from the Baragwanath Hospital after my visit there last week.

The key issues shared: post thrombolytic therapy for latecomer STEMI patients: how to build our decision –making for each particular patient presenting with an open coronary artery, and 60-70% proximal thrombus containing lesion?

During congresses or courses dedicated to the topic of STEMI, Primary PCI is presented as the “*gold standard*” of the reperfusion therapy. Is this really the truth? The data presented...meta-analysis are based on “antique studies”....the past...!

Recently, the trial reported by Armstrong (NEJM 2013) has reopened the door for the place of thrombolysis followed by angiogram and PCI. Probably, thrombolytic treatment would be better than no treatment at all, for patients presenting with STEMI, and transportation time > 2 hours. Thrombolysis is an acceptable option, not only in South Africa but also in all European countries.

The wish that all patients can get a primary PCI < 120 minutes after the onset of symptoms: a dream or utopian idea?

Why not develop an efficient networking and learning programme, including the efficient use of thrombolytic, and protocols post thrombolysis. Many STEMI patients are admitted into hospital and receive thrombolysis. There is a need to share the best management strategy for each of those patients.

There is currently a survey conducted in South Africa, aiming to obtain a better understanding on the STEMI hospitalisation in SA, and during AfricaPCR results and issues will be shared during different sessions presented by Adriaan Snyders (MMed, FACC, FESC) , Chairperson of the SA Heart Early Reperfusion Project, Wilgers Hospital, Pretoria, Gauteng, South Africa, and Rhena Delport (PhD) Associate Professor, Department of Chemical Pathology, University of Pretoria, Pretoria, Gauteng, South Africa. I invite you to participate!

Enriching exchange on **the most efficient use of manual thrombus aspiration**...even after TASTE and TOTAL data!

Why not use this simple device when facing a particular STEMI patient with large burden of thrombus? Just because of data?

Thoughts and exchanges on the patients excluded by randomisation in the TASTE trial, and on the very low rate of 180-day mortality in the TOTAL trial. Does the 3.2-3.5% mortality reflect the reality of “real life” STEMI?

Similar to the TASTE trial, in the TOTAL trial, the «high-risk» patients have probably been excluded to randomisation. It was a matter for discussion and controversy.

Some cases allow us to **share about the best use of anti-thrombotic-antiplatelet agents**, in STEMI patients. Clopidogrel is the most frequently proposed agent, with good rationale to use GPIIb/IIIa inhibitors in selected “young” diabetics patients, with anterior STEMI and early presentation .

A good question was asked by a nurse, “***what was the rationale to perform urgent coronarography and PCI in a 78-year-old patient, presenting with chronic atrial fibrillation, OAC, and an inferior MI, admitted 6 hours after the onset of symptoms***”? What data supports this strategy? Just hypothesis! What do the guidelines tell us for those particular patients? What could be the potential benefit of revascularisation, what could be harmful with the association stent + OAC+ DAP treatment? What net benefit for the patient? Good discussions.

The concept of personalised medicine allows raising questions without answers in guidelines! Sharing experience is key and may allow helping all of us in the decision-making process!

March
26^h

Interventional Cardiology in South Africa: Charlotte Maxeke Johannesburg General Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa.
Third stop: the Charlotte Maxeke General Hospital in Johannesburg.

By Jean Marco, MD, PhD, interventional cardiologist

Some information about the South African cardiology environment

South Africa has:

- **198 registered cardiologists** (approximately **145 practicing as interventionalists**, around 30 with large volume activity)
- **54 cathlabs**
- **818 allied professionals:** technicians, radiologists and cathlab nurses

8 medical schools across the country i.e. Cape Town: Stellenbosch University; Tygerberg Hospital and University of Cape Town; Groote Schuur Hospital; Pretoria: Steve Biko, University of Pretoria; Bloemfontein: University of Free State - Universitas Academic Hospital; Durban: University of Natal - Inkosi Albert Luthuli; Limpopo: Sefako Makgatho Health Sciences University; Johannesburg: Baragwanath and Johannesburg General Hospital.

41 fellows in cardiology are currently in training.



Charlotte Maxeke Johannesburg General Hospital

800 beds
University and Public Hospital: 800 beds

Excellent general presentation, spacious - see on the right a picture of the main entrance corridor.

Friendly welcome by Professor Manga, the head of the Cardiology Division, which is part of the Internal Medicine Department.

The team: 6 cardiologists working full time (part of activity in a private University Hospital): Jameel Moosaf, Keir McCutcheon, Rohan Ranjee, Themba Malukeke, Ahmed Vachiat.

Four fellows are in cardiology training.

The significance of late systolic murmurs



Some words on the history of cardiology!

1962, ...The late systolic murmurs, and ...Barlow syndrome?
JB Barlow was head of the cardiology department in this hospital.
Now cardiologists easily identify the “mitral valve prolaps” at echocardiogram.
But I started my internship in cardiology by learning how to identify in young females presenting with “palpitations”, ... stop to breathe... the late systolic murmur added to a mesosystolic click!The Barlow syndrome!....

One cathlab

24-hour PCI service for STEMI patients.

One cath.lab

Like in other hospitals, for STEMI patients the major issue is late presentation.

Patients treated with fibrinolysis in other hospitals are then referred for investigations.

So, on a regular basis the team members share and build the decision-making for those patients who underwent a coronary angiogram 24-48 hours after fibrinolytic treatment.



NSTEMI or UA patients or patients with investigated ischemia heart disease are referred from other hospitals for coronary angiography.

The incidence of rheumatic valvular disease has decreased during the past years.

23/03, 9:30 am: Meeting with all team members and fellows for exchanges and sharing.

After self presentation, what are your expectations during this session?

Clear ideas about the most appropriate management for each individual patient presenting with “*high-risk*” ACS.PCI: when to do it? When not to do it?

The optimal management of anticoagulant and platelet inhibition for those patients? The management of patients with late presentation?

How to practically manage patients presenting with ACS and multiple vessel disease including CTO.

So, around case presentations, slides from the PCR Seminar library and one of the cases of Thomas Cuisset exposed in the PCRonline Read and share section, we had very interactive and fruitful exchanges...the use of checklists..

I provided all fellows with a copy of the PCR Seminar learning guides and checklist...

Now some of the cases discussed and for which PCI has been performed:

Clinical cases

Patient 1: A 52 year old gentleman (born in 1963), Late presentation in another hospital with an inferior STEMI...

Patient 2: A male, born in 1955, NIRD, Inferior STEMI treated with streptokinase in other hospital, ST Elevation resolved...

Patient 3: A gentleman, born in 1956, two months ago he suffered of recurrent angina during moderate effort...

Please, express and share your point of view on this decision making and procedures with our friends from the Johannesburg General Hospital!

I really appreciated these two days in the division of cardiology of the Charlotte Maxeke Johannesburg General Hospital.

By sharing and exchanging points of view on the concept of “personalised medicine” and how to propose the most appropriate management for each individual patient admitted in this Cardiology Division, taking into consideration each patient’s particularities, global appraisal of clinical presentation and in the light of experience, knowledge and local constraints, I learned a lot!

My sincere thanks to Professor Manga, to all the team members and fellows.

Take a look at this great cathlab team!



March
26^h

Charlotte Maxeke Johannesburg General Hospital Case 1

Selected by Jean Marco, MD, PhD, Interventional cardiologist

PATIENT 1

A 52 year old gentleman (born in 1963)
Late presentation in another hospital with an inferior STEMI
ECG: Chronic atrial fibrillation, ST Elevation, 3 mm in leads D2-D3 aVF
Echocardiogram: cardiomyopathy EF 25%
Recurrent atypical chest pain

Coronary angiogram

What strategy?

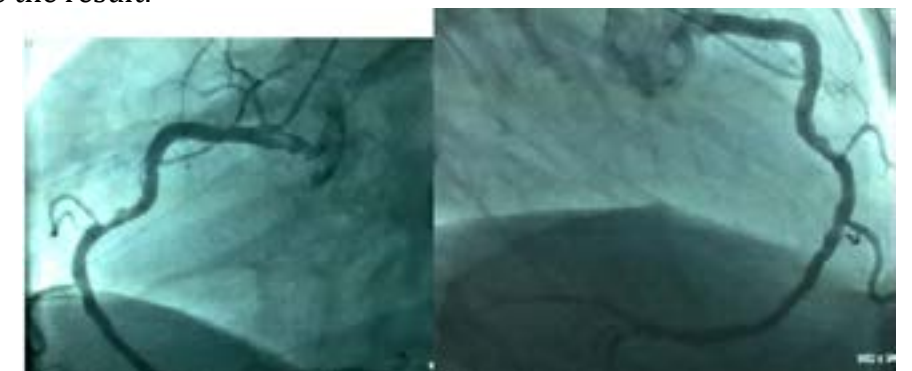
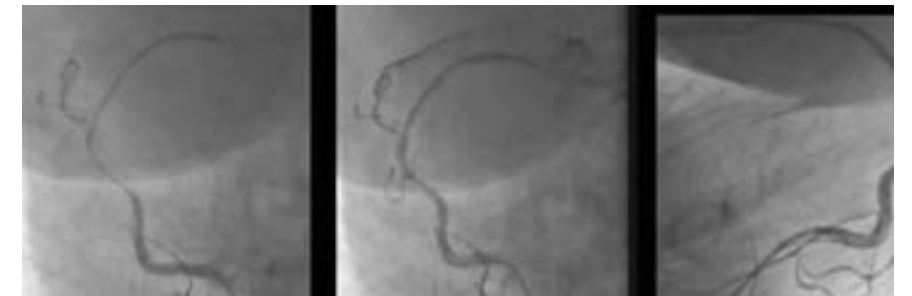
Due to the clinical presentation and the age, the operator tried gently to pass a wire... and performed a Manual thrombus aspiration (Export Catheter).
After several passes and removal of several pieces of large thrombi... see the result below.

Then local administration of thrombolytic agent (TPa, intracoronary bolus 30 mg + 30 mg infusion) through the Aspiration catheter.

The flow was restored, TIMI flow II.
At this stage, it was decided to stop (The art of when to stop!)

On March 25, (I was in the cathlab!),

5 days after the initial angiogram, see the result:



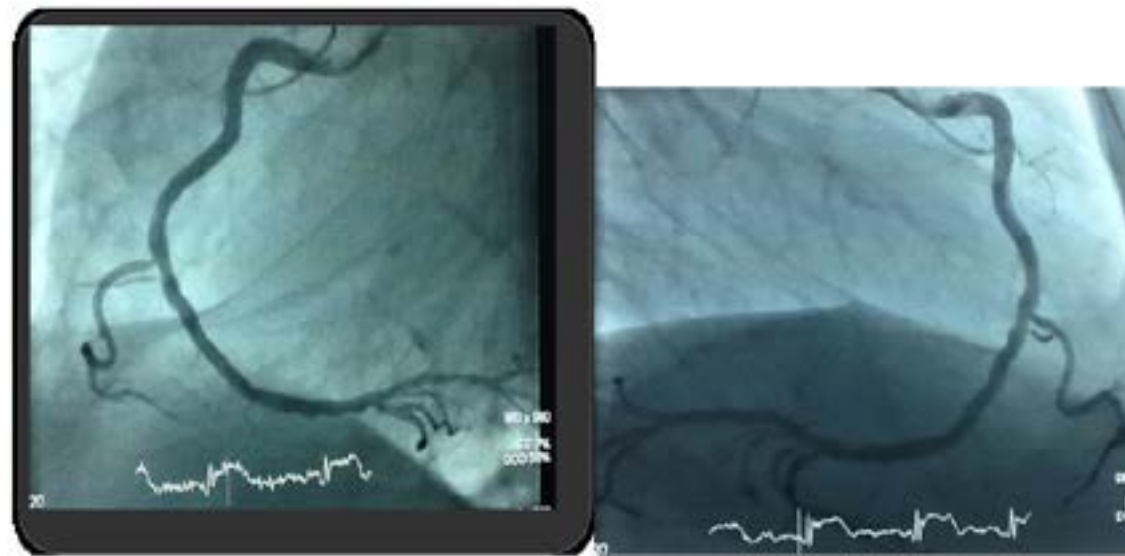
RCA: Normal TIMI III flow, critical eccentric lesion on the mid segment.

QCA is routinely performed for all PCI procedures, very quickly and effectively by a technician lady.



Direct stenting was attempted: impossible to cross the lesion. Pre-dilatation required the use of a Guidezilla catheter (Boston Scientific) to improve the support, then inflation with a 2.0mm and then a 2.5mm balloon to correctly open the lesion!

Result after DES implantation (4.0mm x 30mm to cover the whole lesion and avoid distal thrombus embolization), normal TIMI II flow, all distal branches patent.



After the procedure

Very open-minded discussion on the pro, the contra, the absence of data, the need for a close follow-up.

My message: sharing experience with an open mind and a critical while constructive spirit is the heart of an effective long life post-graduate learning!

March
26^h

Charlotte Maxeke Johannesburg General Hospital Case 2

Selected by Jean Marco, MD, PhD, Interventional cardiologist

PATIENT 2

Selected by Jean Marco, MD, PhD, interventional cardiologist

A male, born in 1955, NIRD

Inferior STEMI treated with Streptokinase in other hospital

ST Elevation resolved

Stable

Transferred for coronary angiogram 24 hours later



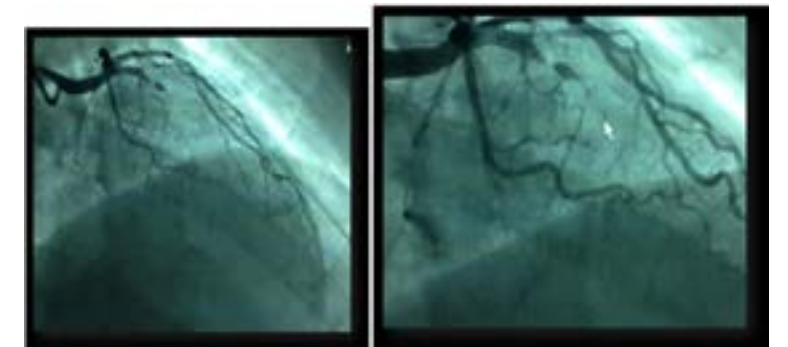
RCA critical lesion on mid segment large dominant vessel, LAD: chronic occlusion

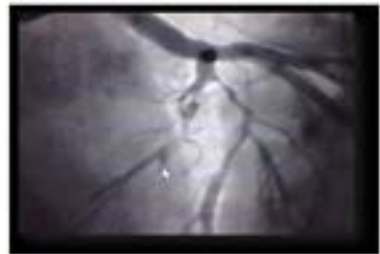
Discussion on the most appropriate strategy
PCI on RCA direct stenting BMS (in order to leave the door open for CABG on LAD)



During the staff discussion on Tuesday, there was a large debate concerning the most appropriate technical strategy concerning the LAD revascularization. It was decided, after open debate, all members expressing their point of view, by consensus to attempt to reopen the CTO, and if the operators failed, mammary implantation on LAD.

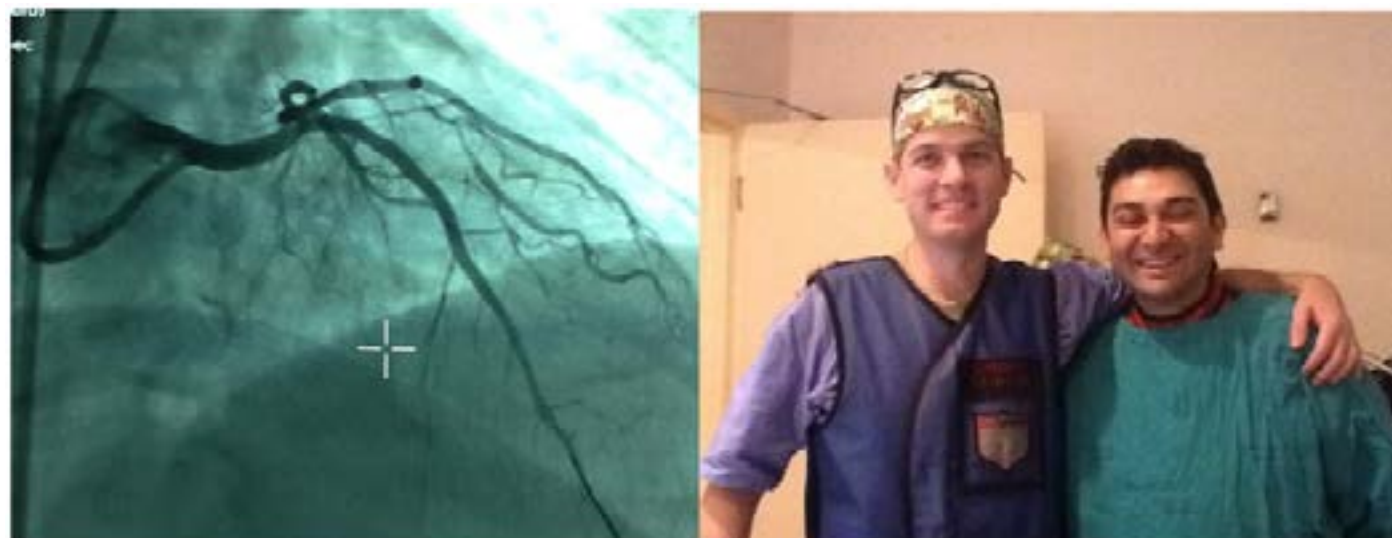
Wise and effective manipulation of only one wire (ASAHI SION) throughout a Micro catheter (ASAHI Corsair) The two stump were crossed, balloon dilatation





The queen of the QCA, estimated the total length of the lesions requiring to be stented! Very effectively, congratulations!

Final result after implantation of 2 DES, 2.5x18mm Integrity distally + 2.75x25mm Integrity proximally and post dilatation with a NC balloon (3.0 mm)



They did a great job, in a quiet atmosphere thanks to a great team work!

This young gentleman will be discharged with clopidogrel for one year, + ASA + Statin + ACE inhibitor + beta-blocker
A stress test is planned at one month.

My message: an open-minded team discussion in order to reach a consensus on the most appropriate management strategy and team work involving two operators and well trained Allied professionals allowed this patient to get an efficient revascularization of complex LAD CTO!

March
26^h

Charlotte Maxeke Johannesburg General Hospital Case 3

Selected by Jean Marco, MD, PhD, Interventional cardiologist

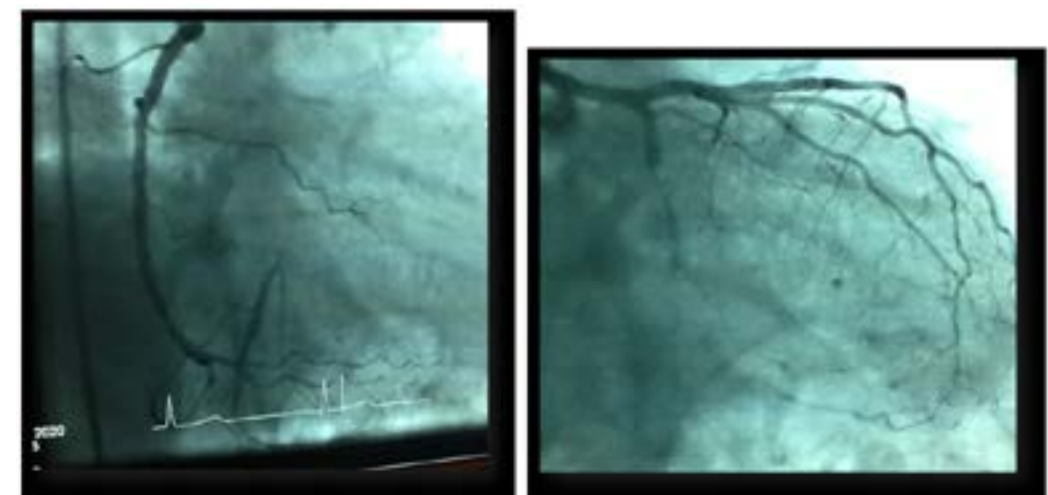
PATIENT 3

A gentleman, born in 1956.

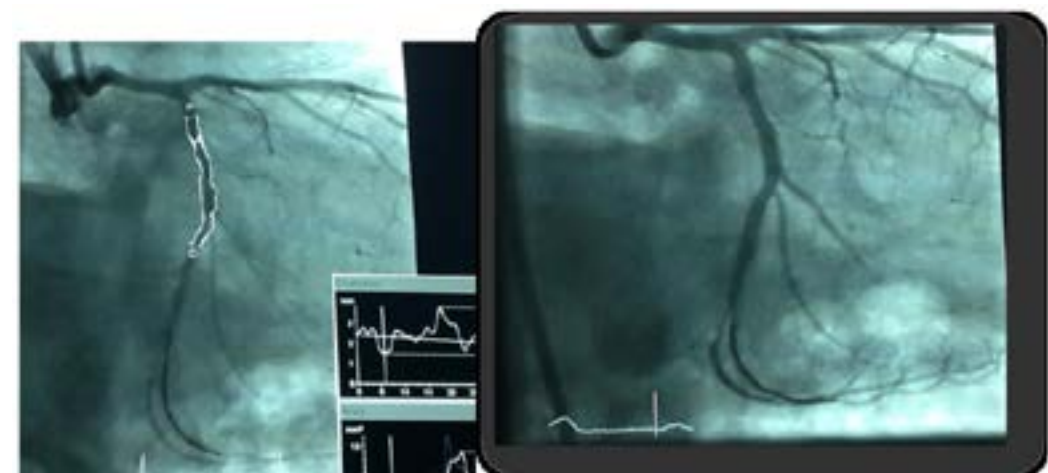
Two months ago he suffered from recurrent angina during moderate effort.

He underwent a stress treadmill test: positive, angina and 3 mm ST depression in > 3 leads.

Coronary angiogram (other hospital) showed (see below) no significant lesion on RCA, + collaterals to distal LCx Ramus, sub occlusion of the LCx, no significant lesion on LAD.



This gentleman was referred for PCI on LCx.



Again the team performed a great job, a systematic QCA!
See the result... RCA to distal LCx collaterals disappeared.

Interventional cardiology in South Africa: Steve Biko Academic Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa.
Fourth stop: the Steve Biko Academic Hospital, University of Pretoria.

By Jean Marco, MD, PhD, interventional cardiologist

On this stop, discover the Steve Biko Academic Hospital.



Steve-Biko-Academic-Hospital-University-of-Pretoria

8 am: a warm welcome from Professor Andrew Sarkin.

Around a cup of coffee, friendly and open-minded exchanges on the hospital's history and medical activities in South Africa.

The Pretoria Academic Hospital was renamed in 2008 to the Steve Biko Academic Hospital.

Steve Biko was one of the more influential anti-apartheid activists, he founded the Black Consciousness Movement and he died in 1977.

This hospital is a purely tertiary healthcare institution, rendering specialised and highly specialised services to medically referred patients. It is the main teaching hospital of the University of Pretoria along with Kalafong Hospital in Atteridgeville, west of the city centre.

About medical activities in South Africa

Around 15% of the population has health insurance and 85% no insurance.

Around 85% of medical doctors are working within the “private sector”, and only 15 % in the purely public sector, taking in charge around 80% of the population.

This very unbalanced situation presents the biggest challenge.

Every year, only about 12 new cardiologists graduate despite the increasing rate of coronary artery disease in SA.

The Cardiology Department

Professor Andrew Sarkin is the head of the Cardiology Department: 20 beds for cardiology plus 7 beds for ICU. He is the only registered cardiologist. His team includes 3 fellows, and some «external consultants».

Around 5-7 STEMI patients are admitted every day, most often «late presenters» and referred from

other hospitals.

One cathlab, no 24h/7 service, shared with Pediatric Cardiology activities.

Visit of patients in the ICU, with fellows, medical clinical technologists in training, the Chief of cardiology technologists and students.

Young (between 50-66 years old) STEMI patients referred from other hospitals post thrombolytic, STEMI later presented, multiple co-morbidities...

Patients

Patient 1:

66 year-old male, prior PCI on LAD + Promus stent 4 years ago, anterior STE- MI, admission in other hospital, Killip IV, thrombolytic (twice: Actilyse), atrial fibrillation, pneumonia, renal insufficiency, heart failure...dobutamine, amiodarone..clopidogrel, ASA, LMWH...

Echocardiogram/ LVF depressed, anterior aneurysm.

Coronary angiogram/ LAD patent post thrombolytic, OM: critical stenosis, LCx critical stenosis, RCA, diffusely diseased.

What is the most appropriate strategy? What data? A decision-making process based on reflection and experience!...

Patient 2:

62 year-old male, inferior STEMI, fibrinolysis (Actylise) in other hospital hours after symptoms onset, ventricular fibrillation, cardiogenic shock, pmeumopathiy, renal insufficiency, sepsis.

Echocardiogram: right and left ventricular dysfunction.

Open discussion on the most appropriate treatment strategy for this particular patient? What do guidelines tell us? Nothing!...

Patient 3:

50 year-old male, diabetic, accelerated and recurrent angina, recurrent angina at rest, crash car... admitted in other hospital, neck injury ...thrombolytic, ...inferior STEMI...transient vision troubles... carotid occlusion ...Echo: anterior dyskinesia +septal and apical LARGE thrombus...

HbA1C: 13%!...

What information do we have? What information do we need?

Discussion on potential benefits versus potential harm of the different strategic options.

What we don't know? What strategy?

Patient 4:

62 year-old anterior STEMI, retrovirus positive, lyric therapy < 3 hours after symptoms onset, ECG: ST elevation > 4 mm leads V2-V3-, T negative wave leads 4-5-6.

Echo: large anterior hypokinesia

What strategy?

Patient 5:

62 year-old lady, antero-lateral STEMI, lytic therapy in other hospital, 3 hours after symptoms onset, large Echo: hypokinesia.

What is the most appropriate strategy for each individual patient presenting late after thrombolytic therapy and co-morbidities?

In the two weeks spent in different public hospitals in South Africa, I personally saw more STEMI patients treated with thrombolytics, than in any year of my career as an interventional cardiologist in Clinic Pasteur in Toulouse, France!...

2.30 pm: meeting with Professor Andrew Sarkin and a group of 3 medical students

The students have spent 5 years in medical school, 3 fellows in cardiology, 1 starting a fellowship in internal medicine, 1 registered in internal medicine, 5 clinical technologist students.

We shared experience and knowledge on “the most appropriate management strategy for each individual patient presenting with an “High-risk” NSTEMI-ACS.

Case-based discussion and step-by-step reasoning approach according to the concept and content of PCR Seminar Learning Guide and a case from Thomas Cuisset’s library.

Great exchanges.

And tomorrow, we will continue with other practical discussions around new patients!

March
31st

Interventional cardiology in South Africa: Steve Biko Academic Hospital - University of Pretoria - second installment

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa.
Fourth stop: the Steve Biko Academic Hospital, University of Pretoria.

By Jean Marco, MD, PhD, interventional cardiologist

On this stop, discover the second installment of Jean Marco’s visit to the Steve Biko Academic Hospital.

After a first day at the hospital, this morning we started (like a majority of you!) the daily activities by a visit of hospitalised patients.

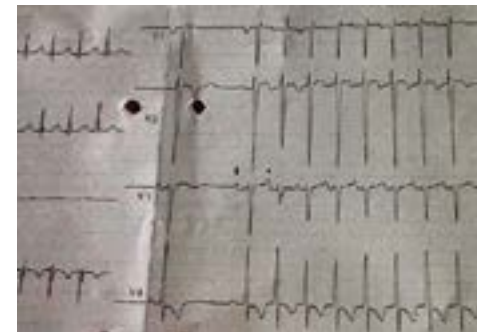
All patients present complex clinical situations.

Of course as I mentioned yesterday, late presenter after acute coronary syndromes...as usual in all hospitals I visited in SA, young patients with large extended MI...and heart failure !...

But, sharing some other problems :

This 14 year-old female was admitted for “palpitations” and symptoms of heart failure.

Look at the ECG and please share your point of view!



The echocardiogram showed global dilatation, EF25%, LV diameter 58 mm! Is it a cardiomyopathy, or myocarditis?

After Adenosine, probably an atypical atrial tachycardia(130bpm) induced by atrial ectopic beats, and interrupted by atrial ectopic beat.

On Carvidolol...new episodes...no durable effect...

Well...easy...this is an indication for an EP study and ablation of the probable intra atrial circuit...for this 14-year-old female it is the most appropriate option in order to improve symptoms, and then to investigate the potential causes of cardiomyopathy and the most appropriate treatment...however...EP study and ablation are only possible in “private hospitals” ...if insurance...or if family pay the fees...the fees for a such procedureincredible...and no possibilities for the family...how to find a solution?...very unbalanced health care system and problematic for the majority of patients...we, in France and majority of EU countries we are not facing with such daily human problems!... In Clinique Pasteur in Toulouse) it is very easy to express what is the best approach and treatment for this girl.. and apply it!...There, Professor Andrew Sarkin try to find a solution...

A 20-year-old male...severe ventricular arrhythmia, ...and induced cardiomyopathy or Myocarditis?



Next...look to the ECG at admission of this 70-year-old female...she was admitted for 3 palpitations, 3 dyspnea... waited 24 hours at home before getting access to appropriate medical care.

See picture 2...24 hours after “palpitations”!

These are only a few examples of the daily problems and the discrepancy between the healthcare needs and means in this country, as Professor Andrew Sarkin shared with me, including the major issues in huge parts of the country lacking any organised healthcare system or even medical doctors!...

After this visit... time for sharing with a group of students and fellows.



Wednesday: continuing the visit

Morning Surgical Meeting: Prof Andrew Sarkin, Prof Du Plaissis, cardiac surgeon, or “fellows in cardiology, registered fellows and or fellows in cardiac surgery».

First, news from our 14-year-old female, with atypical atrial tachycardia and cardiomyopathy...despite optimal dose of Carvidolol, she is against in tachycardia...160 bpm....waiting for a solution!...

Discussion of patient candidates for surgery

First I am impressed by the quality of the preparation! Fellows and Internal medicine registered have prepared the entire files, with all clinical information, clinical examination, biological and non invasive imaging tests, the printed documents are exhaustive and distributed, shared , commented by all participants. Really, the global appraisal of all patient information is applied, shared and well prepared!

Prof Andrew Sarkin, Prof Du Plaissis take time to share, explain, listen questions, comments or point of views expressed by fellows, and deliver basic understandable information for students!

All pictures of echo, CT scan, angio are presented on a large screen and with an excellent step-by-step teaching process.

It is really a teaching hospital!

Patients with CAD, young patients with valvular heart disease and a discussion about the issues of oral anticoagulants after surgery for those patients living at long distance from any organised medical structures!... It is a real challenge in this country to organise an efficient healthcare system taking into consideration the huge needs, and level of education of the population, and such complex multi-diseases,... HIV!...

I received interesting information about the incidence of HIV myocardial cell inflammation and depressed

left ventricular function in patients with mitral regurgitation and LV function recovering after retrovirus treatment before surgery! I learn by sharing local experience, new information for me!



Look at this picture: a huge intra right atrial mass in a 14 year old boy. I have reported this observation last Monday. What is it...atypical right atrial myxoma? PET imaging in favor of a large thrombus? Decision, surgical excision and seeing.

Other major problem for surgery: the waiting list!...at 4 months or more, except for a few cases of urgent, very high-risk CAD patients! So, many of those patients get a date for valvular replacement (i.e. for a 26-year-old lady with mitral regurgitation and tricuspid...end of august... she will go back home, very far away....and may be never come back for surgery...).

All patients (including illegal immigrants!) can be admitted for free in this public hospital and treated... but after discharge... difficulties... even for diseases like tuberculosis...

The health system has good positive aspects for this population, but a strong lack of healthcare professionals in the public sector, and a huge difference between ...public and teaching hospitals and the private system!...

Only around 15 new cardiologists each year, trained for 3 years after their full cursus in medicine school, internal medicine, registered, and training in teaching hospitals, a very long cursus, and the majority of them will move to the private sector... taking in charge 15-20 % of the population! 15-20% of other doctors take charge of 80% of the population!... Big issues and discrepancies...

A huge part of the country is not covered by any organised system with a medical doctor (GP) available, I saw patients who have expressed their experience...chest pain...recurrence of chest pain...driving for a long distance before getting a first medical contact and.... turned away from institution to institutions (one patient reported going to 3!...) to get an admission.... because of lack of financial support!

Wednesday afternoon

Lectures in the medical school... interesting group,including our fellows and other specialities ...we exchanged about “Understanding the Essentials on trials and registries, a good way to enhance our professional proficiency” and “ A patient presenting symptoms of possible ACS: a journey form first contact through a personalised decision-making process for the most appropriate management and at discharge...education is key!”...interesting exchanges, and difference between... “what the guidelines tell us and what is the most appropriate for each individual patient in this country»....

March
31st

Interventional cardiology in South Africa: Steve Biko Academic Hospital - University of Pretoria - Part III

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa.
Fourth stop: the Steve Biko Academic Hospital, University of Pretoria.

By Jean Marco, MD, PhD, interventional cardiologist

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April
9th

Interventional cardiology in South Africa: Bloemfontein Universitas Academic Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa.
From 6th to 10th April, visit the Bloemfontein Universitas Academic Hospital.

By Jean Marco, MD, PhD, interventional cardiologist

7th April: discovering the Bloemfontein Universitas Academic Hospital

I am warmly welcomed at the airport by Pr Makoali Makotoko, head of the cardiology department of the Universitas Academic Hospital.

She provides me with some information about Bloemfontein (“*fountain of flowers*” or “*fountain of blooms*”), also poetically known as “the city of roses», it is the capital city of the Free State province, seat of the Supreme Court of Appeal and is therefore generally regarded as the judicial capital of South Africa.

The Mangaung Local Municipality has a population of around 650,000 (Free State has 2,800,000).

The Universitas Academic Hospital, with 1000 beds, is a teaching hospital built in 1979, the cardiology department includes 30 beds for the general ward, 6 beds for ICU and one cathlab.



Pr Makoali Makotoko's cardiology team includes 3 fellows: Dr Sizwe Mthiyane, Dr Andile Xana, Dr Kgmoso Moroka and registrars (see picture 1: Pr Makotoko and her team).

Visits in the ICU: as in all the South African public hospitals I have visited, there are very complex patients with multiple severe co-morbidities.

See some examples:

A 41-year-old gentleman, rheumatism valvular disease, endocarditis, multiple-septic vegetation embolisms - recurrent episodes of strokes, renal insufficiency, both legs, pulmonary oedema, pneumopathia, severe pulmonary distress...tracheal intubation, followed by tracheotomy, pulmonary assistance...

A 45-year-old gentleman, severe heart failure, severe mitral regurgitation + aortic regurgitation + tricuspid insufficiency and...endocarditis!

A 32-year-old gentleman, HIV positive, endocarditis, acute severe aortic regurgitation, renal insufficiency and anuria requiring haemodialysis...waiting for surgery after a few days of antibiotherapy...

What do guidelines tell us about the most appropriate timing for surgery?

As it concerns patients with coronary artery disease, the major problems, as in all the public hospitals I have visited in South Africa are:

Late presenter STEMI patients, STEMI patients admitted post fibrinolysis, and very young patients, HIV positive presenting with STEMI or NSTEMI ACS, with large obstructive thrombus burden on the proximal segment of major coronary artery, without any visible atheroma lesion.

- Clinical case 1 - A patient presenting a large anterior STEMI: a journey from the first medical contact to the hospital
- Clinical case 2 - A 30-year-old gentleman, HIV positive, and triple retrovirus therapy
- Clinical case 3 - A 82-year-old gentleman, very good condition and normal life, until recurrent episodes of unstable angina
- Clinical case 4 - A 54-year-old lady, obese, hypertensive, severe hypercholesterolemia, underwent CABG with 4 grafts in 2005
- Clinical case 5 - A 40-year-old gentleman, HIV positive, treated with triple anti-retrovirus therapy

8th April: SASCI Evening Meeting with local Cardiologists, Nurses, Technicians, Radiographers...on STEMI

Case-based ... open minded interaction and engagement of all participants, sharing experience and knowledge, on the most appropriate management strategy for a patient presenting with STEMI in Bloemfontein area... the best use of fibrinolysis and antithrombotics and the most appropriate pharmacological-intervention approach, taking into consideration...the huge area and the transportation time issues. Good discussions!

April 9th:

For the first time during my visits in South Africa hospitals, a lecture, sharing point of views and experience with the whole surgical team: the most appropriate management strategy for each individual patient presenting with LM or/and MVD ! Great, very open- minded exchanges and comments expressed, the whole team actively participated.

A very fruitful stay in Bloemfontein Universitas Academic Hospital.

Thank you very much Pr Makoali Makotoko, you are doing a great teaching work in a very humanist way in this hospital.

Thank you Drs Sizwe Mthiyane, Andile Xana, Kgomo Moroka: by sharing with you experience and knowledge, I have learnt from you. I wish you a full success for your final exams...and career.

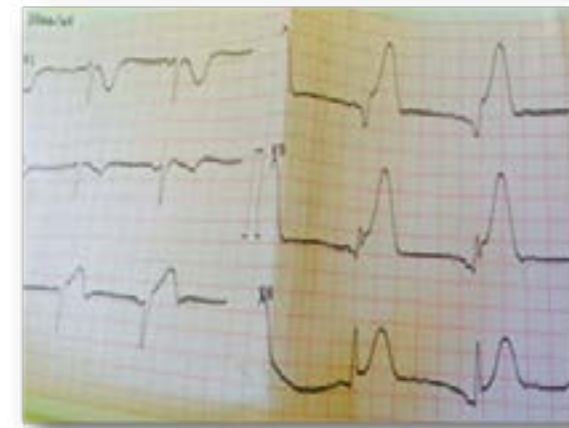
April
13th

Bloemfontein Universitas Academic Hospital: clinical case 1

By Jean Marco, MD, PhD, interventional cardiologist

A patient presenting a large anterior STEMI: a journey from the first medical contact to the Universitas Academic Hospital

A 72-year-old gentleman with typical symptoms of MI consults a GP less than 2 hours after the symptoms onset, ECG is performed...GP sent clinical information and ECG by WhatsApp, using his Smartphone to the on-duty cardiology team in Universitas Hospital.



The use of personal smartphones and WhatsApp is part of the routine daily practice in the South African public hospitals! We have to take this point into consideration!

A checklist process application for smartphones would be useful to check potential risks and optimise the safety spread of local use of fibrinolysis, even by non-cardiologist MD, not only in Africa but also in some European countries.

So, the diagnostic is confirmed... however, fibrinolytic therapy is not available locally!

WHAT NOW?

No «local» hospital with cardiology capabilities to take in charge this patient and administer Streptokinase!

Transfer to Universitas Academic Hospital: yes... ambulance and ...transportation time > 6 hours from the GP office to the hospital!

So, despite an early presentation, by the time this patient with a large anterior STEMI has been admitted, 9 hours have passed since symptom onset, only due to the distance from the living area and one hospital with the capability to administer early fibrinolysis.

This gentleman was admitted with severe heart failure symptoms, Killip III, EF < 30%!

This is a common problem in this very huge country!

April
13th

Bloemfontein Universitas Academic Hospital: clinical case 2

By Jean Marco, MD, PhD, interventional cardiologist

Sharing together the history of a 30-year-old gentleman, HIV positive, and triple retro virus therapy, on «classic» CAD risk factor, presenting with an anterior STEMI 6 hours after symptoms onset.

LV angiogram showed a large anterior and apical hypokinesia, EF: 50%

See coronary angiogram: pictures 3-4-5

LAD obstruction, no atheroma on LCx –RCA



Picture 3



Picture 4



Picture 5

After crossing the thrombus with a wire and manual thrombus aspiration (See picture 6)



Picture 6

A TIMI II flow was restored on LAD, a large vessel with a “complex” residual narrowing just after the take-off a larger septal branch.

April
13th

Bloemfontein Universitas Academic Hospital: clinical case 3

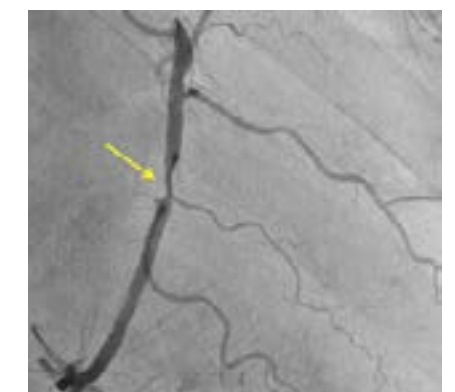
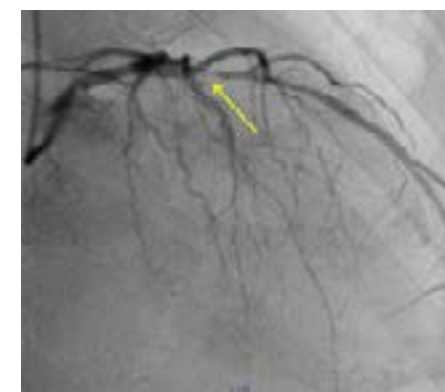
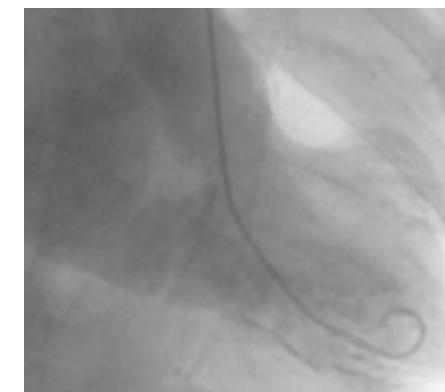
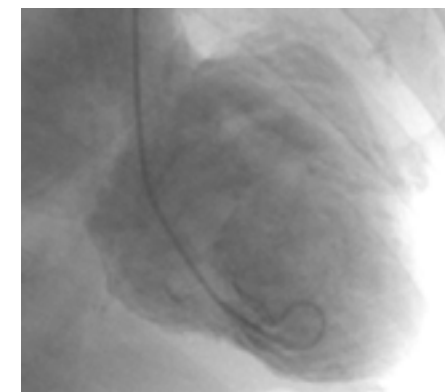
By Jean Marco, MD, PhD, interventional cardiologist

Sharing some examples of the Fellows activities in the cathlab during my stay:

Clinical case 3: a 82-year old gentleman, very good condition and normal life, until recurrent episodes of unstable angina, dyspnoea, and admitted with NSTEMI presentation.

At admission, moderate symptoms of heart failure and mitral regurgitation, severe renal dysfunction, key biochemical markers: CrCl 20 ml, Ht: 12g/l, significant troponin release (x2).

Coronary angiogram performed after adequate hydration showed LV dysfunction, MR and 3 vessel disease:



Open-minded pluridisciplinary team discussion (cardiologists, nephrologists, cardiac surgeon, nurses, technicians) and consensus: due to the depressed renal function, and estimated peri-operative surgical risk, the surgeons declined surgery. The nephrologists agreed for an haemodialysis if needed, soon after a PCI procedure, in the ICU.

April
13th

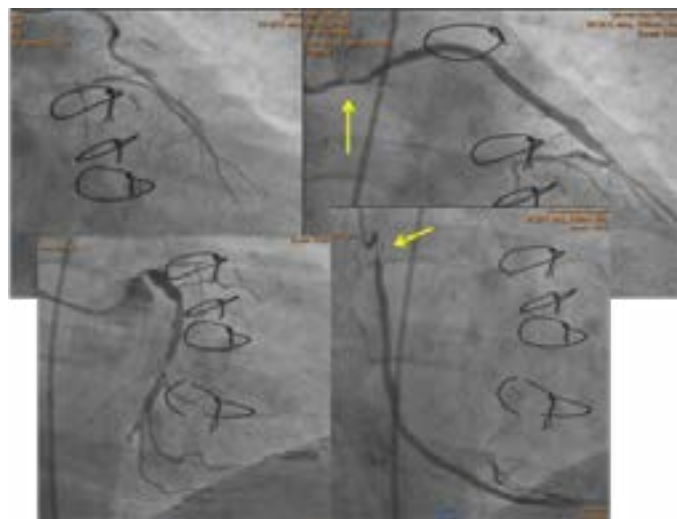
Bloemfontein Universitas Academic Hospital: clinical case 4

By Jean Marco, MD, PhD, interventional cardiologist

A 54-year-old lady, severely overweight, hypertensive, severe hypercholesterolemia, underwent CABG with 4 grafts in 2005

She suffered of recurrent angina, CCS: 3, worsening recently. Stress test: positive, 3 minutes, inferior-lateral severe ST depression > 3 mm, + angina

Coronary angiogram showed:



LIMA-LAD patent, > 70% calcified LM stenosis, diffuse stenosis on LCX, occlusion of the OM, occlusion of OM graft, severe sub-total stenosis on the SVG to diagonal, severe sub-total stenosis on the SVG to RCA graft.

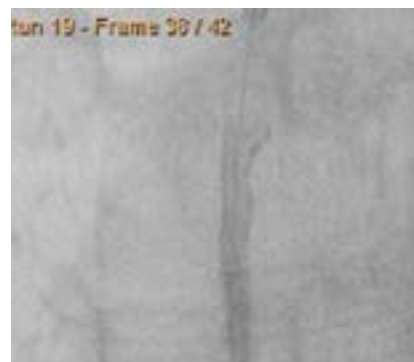
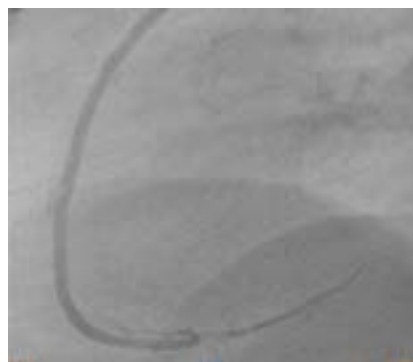
PCI was decided: first stenting with DES the grafts osteal lesions, then follow-up, and according to symptoms and residual ischemia, PCI on LM-LCx.

Dr Kgmotso Moroka, the youngest fellow, planned carefully the strategy and accordingly the adequate

material: Plan A, plan B contingent plan, and bail-out strategy if needed

Dr Kgmotso Moroka: you have done step-by-step great work, following you planned strategy!

See the final result:



April
13th

Bloemfontein Universitas Academic Hospital: clinical case 5

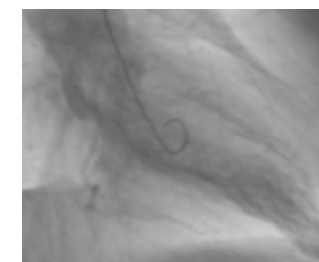
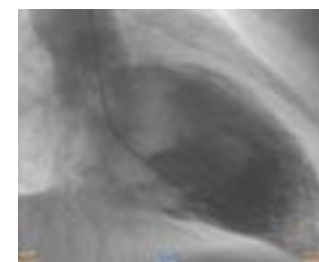
By Jean Marco, MD, PhD, interventional cardiologist

Sharing another difficult case explored and treated by Dr Andile Xana, the third fellow.

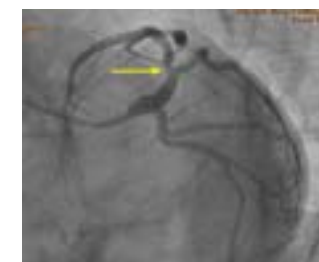
A 40-year-old gentleman, HIV positive, treated with triple anti-retrovirus therapy, admitted with a «high-risk» ACS presentation (chest pain at rest, severe negative T wave in leads V4-V6).

LV: localised apical dyskinesia.

Normal RCA:



Proximal LAD: an eccentric, 50-60% narrowing, analysed carefully in different orthogonal views.



Questions

Is the image in favour of a residual thrombus after the thrombotic event or in favour of a fixed stenosis + thrombus event?

By taking into account the global patient's appraisal, and the co-morbidity context (HIV + triple anti-retrovirus therapy), what is the most appropriate management strategy?

Answer

It was decided to perform FFR and build the decision-making accordingly.

FFR was very well performed thanks to the help of a well trained Technician.

FFR result: 0.64-0.60

It was decided to fix the lesion with a DES followed by a double daily dose of Clopidogrel.

PCI strategy was defined according to a step-by-step analysis of the feature of the bifurcation lesion: provisional stenting with 2 wires, diameters and stent length define by QCAthen POT, and just opening of the stent strut with the tips of a 2.5mm balloon inflated in the proximal part of the diagonal.

Multiple QCA measurement and stent boost assessment...before, during and after the procedure, thanks to expertise of Radiographers

Excellent final result!



There are just some examples of the great training process delivered in this teaching hospital by Pr Makoali Makotoko and I wish to share with the PCR community.

All the afternoon, we shared with the team about ...”what is the most appropriate management strategy for each individual patient presenting with a particular clinical situation, taking into consideration their clinical particularities in the light of local experience».

We shared on NSTEMI-MI: How to successfully treat a patient by PCI, how to define the strategy by using a systematic step-by-step approach, reasoning and building-process,...STEMI, Bifurcation techniques..., by using the PCR Seminar educational material and Live- in-the-Box.

Again, the PCR Seminar Learning Guide, Check-lists and PCR Book of Trial were shared, appreciated and provided to the entire team members.

We have to use it more for educational purpose!

April
20th

Interventional cardiology in South Africa: Bloemfontein Universitas Academic Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa.
From 12 to 17 April, discover a visit to the Inkosi Albert Luthuli Central Hospital in Durban.

By Jean Marco, MD, PhD, interventional cardiologist

12 to 17 April: a week in Durban

On Friday 10, late evening, Pr Sajidah Khan welcomes me warmly and provides me with some information on Durban, the largest city in the South African province of KwaZulu-Natal. The Durban Metropolitan Area ranks second among the most populous urban areas in South-Africa, virtually on par with Cape Town. The municipality, which includes neighbouring towns, has a population of almost 3.5 million, making the combined municipality one of the biggest cities on the Indian Ocean coast of the African continent. Durban Harbour is famous for being the busiest in South Africa and the African continent.

On 11 and 12 of April I take some time to visit the city.

On Monday 13 April, first contact with the Inkosi Albert Luthuli Central Hospital: it is a teaching hospital, including 800 beds. The cardiology department consists of 42 beds for the General Cardiac Ward, 6 beds for CCU, and two cathlabs (one single plane, one biplane). The activities of the catheter laboratories fall into coronary and structural adult investigations and interventions, pediatric cardiology, electrophysiology studies and ablations, and pacemaker implantations.

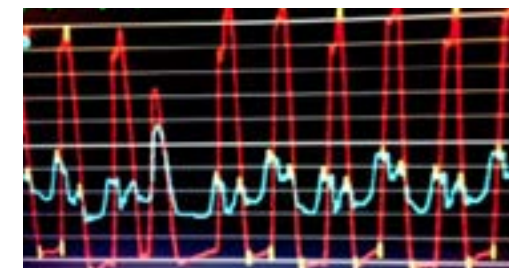
Visit of the CCU

Sharing together the clinical history of the first patient:



A 15-year-old female, from Zululand (the land of a thousand hills), has been admitted with a severe pulmonary edema...due to severe mitral stenosis.

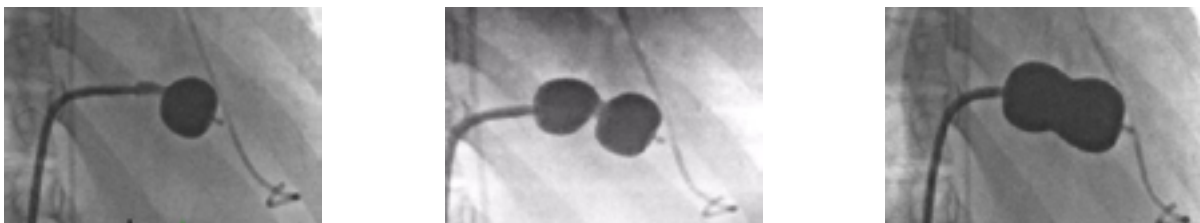
ECG on admission: SR, but see the P wave in leads D2-V1!



Echocardiogram: severe mitral stenosis, area 0.4 cm², huge dilatation of the LA.

Left and right catheterisation quickly performed: transmitral gradient: 32 mmHg, systolic pulmonary arterial pressure: 110 mmHg!

Only ONE Inoue balloon inflation!



Immediately the trans-mitral gradient fell to < 5 mmHg!

She recovered very quickly in a good condition, and this Monday she was symptom-free, smiling and ready to go home for the “Zulu hills land”, so happy!

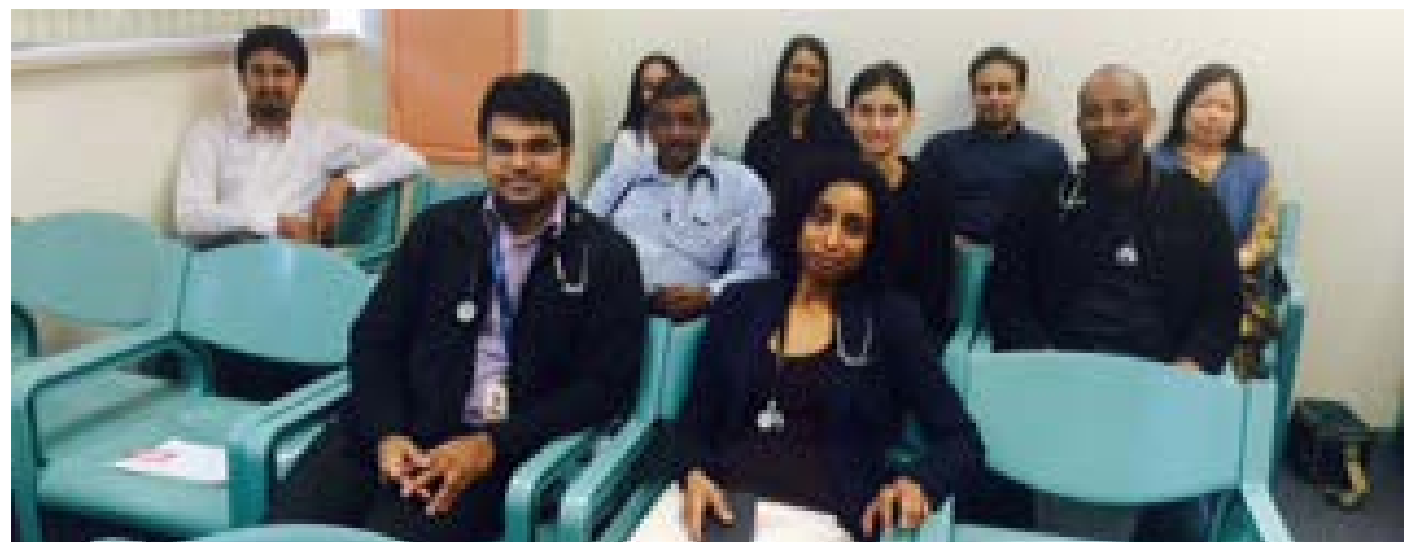
Her comments: “Thank you, I want to be back at school as soon as possible”



Fellows and Registrars in training take in charge in the general cardiology ward and CCU a wide variety of pathologies: complex and severe valvular diseases (mainly rheumatism), coronary artery disease presenting with ACS, severe heart failure secondary to cardiomyopathies, and arrhythmias mainly in very young patients. This is a unique opportunity for rapid and global learning in cardiology!

Fellows in cardiology have the responsibility of clinical care, echocardiography studies, and hemodynamic studies. The day-to-day learning- training processes are

excellent and when sharing with those Fellows, as usual in South Africa, I am very impressed by the wide amount of basic knowledge and results of trials on different topics.



Some example of complex patients:

A 25-year-old lady, living in a rural area, 150 km away in Zulu land territory, with huge difficulties for transport from home to a rural hospital and then transferred, admitted with severe heart failure symptoms, atrial fibrillation, and tachycardia. Echo showed massive mitral regurgitation, LA diameter: 70mm, LV diameter: 60 mm! Heparin and rate control by using step-by-step digoxin, furosemid, ACE, and carvedilol ...rate 80 bpm...and now? Cardiac surgery planned but the waiting list is the major issue!

A 26-year-old lady, severe heart failure, tachyarrhythmia, atrial fibrillation, massive mitral regurgitation, EF: 45%, LA diameter: 77 mm!

A 54 -year-old lady, acute decomposition of a cardiomyopathy, HF grade IV, EF 25%, LV indexed TD diameter: 65 mm, AV block, LAD critical obstruction, recanalization + Stent, AV block back to SR, left bundle branch, planed for pacemaker + CRD

A 35-year-old lady, 6 children...- a few months after delivery she was admitted in very poor health: endocarditis, massive vegetations on aortic and mitral valves, multiple septic remobilisations... multiple right and left strokes, bilateral limb ischemia with trophic skin ulcers and wounds, severe impaired renal function due to embolisation into the renal arteries...

In all the hospitals I visited in SA, I saw identical very young patients, with severe valvular endocarditis... multiple and diffuse peripheral septic embolisms, strokes, renal insufficiency. Prevention, early diagnosis and early treatment of valvular endocarditis are a major concern in South Africa.

Sajidah Khan explains to me the main cumulative reasons for this: many remote living areas with lack of access to general practitioners, and rural population culture that results in people presenting with serious illness first asking for advice from the local traditional healer, for traditional ancestral treatment, before consulting with a general practitioner.

Concerning coronary artery disease:

Due to the large Indian population living in the Durban area, the incidence of CAD is high, with frequently young patients presenting with high-risk ACS symptoms and severe multivessel coronary disease and diffuse atheroma, and a high incidence of diabetes. This Indian population seems to be less exposed to HIV problems.

In the black population, CAD is more prone to be related, in very young patients, to thrombosis in the proximal part of major vessels (LAD), without atheroma on other segments/vessels. CAD related to HIV vascularitis and the triple anti-retroviral treatment is more frequent in the black population as compared to the Indian population. Late presenter STEMI patients is a major concern, for the same reasons exposed previously.

Some examples:

A 54-year-old gentleman presented typical symptoms of myocardial infarction on 11 April at 4 am. His wife drove him to a local hospital, at 11 am...waited in the huge queue...with persistent chest pain, dizziness...and saw the GP at ...8 pm! Chest pain is not a major reason for priority consultation in the queue: otherwise, all patients will claim chest pain! The patients arriving in the local hospital by ambulance have priority, not the patients arriving with a private car! They have to wait in the queue. Diagnosis at 8 pm: Inferior STEMI, transferred to the Inkosi Albert Luthuli Central Hospital at 10 pm!

Coronary angiogram 24 hours later: inferior-lateral akinesia occluded RCA, diffusely LCx atheroma, normal LAD, medical treatment decided.

Discover other clinical cases from this hospital:

- Clinical case 1 - A 43-year-old gentleman with inferior STEMI, late presenter
- Clinical case 2 - A 38-year-old gentleman, late presenter, anterior STEMI
- Clinical case 3 - A 53-year-old Indian lady, late presenter after anterior STEMI

SASCI Evening meeting, on Wednesday 15

A large group of local cardiologists share experience and issues, with a very open-minded exchange, in a friendly and fruitful atmosphere.

About the pharmacological- invasive strategy approach for STEMI patients admitted in local hospitals: indisputably, this strategy, adding thrombolytic, clopidogrel, LMWH followed by a planned transfer for coronary angiogram and accordingly PCI is the best approach in this area, where primary PCI is to be considered a «utopia» due to the transportation and distance issues. We exchange our points of view on the most appropriate management strategy for each individual patient presenting with STEMI.

Late presenter is a matter of debate:

- What strategy when facing with an open vessel in the absence of thrombolytic therapy?
- What strategy in very young patients presenting occluded LAD > 48 hours after anterior STEMI, and moderate LV dysfunction?

Other important point of discussion: the best use of manual thrombus aspiration, in order to improve the efficiency and avoid complications!

On Thursday, I take part in a surgical meeting: 18 various patients were discussed. Half of the patients presenting with severe post-rheumatism valvular disease, half presenting with complex CAD. The majority of presented patients were planned for surgery. The major issue is the very long waiting list!

Thank you to Sajidah Khan and her team!

My warm thanks to Sajidah Khan for this unforgettable experience. You are doing great teaching and practical training work with your group of very interesting fellows...their expectations, the final exam! You provide them with a lot of tips and hints, and you have a great, humane behavior with patients and all your team members. Clearly your cardiology department and cathlabs are a really good teaching example.

Last but not least: unfortunately, the majority of the fellows in cardiology, after achieving their full training period and exams, will work in private practice, so, the problem of the senior cardiologists in the hospital will be unchanged!

April
13th

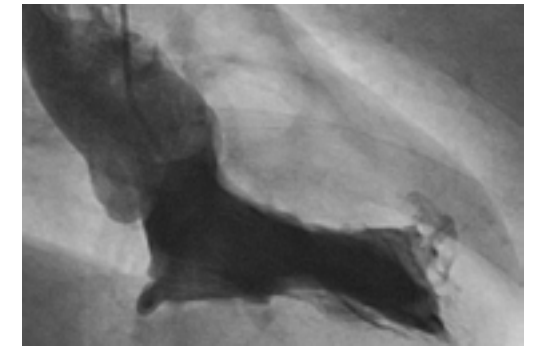
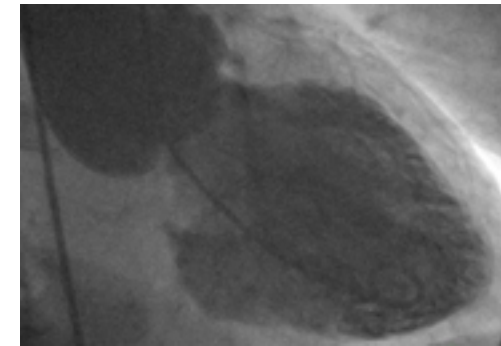
Inkosi Albert Luthuli Central Hospital - Clinical case 1

By Jean Marco, MD, PhD, interventional cardiologist

A 43-year-old gentleman, inferior STEMI, late presenter

24 hours after symptoms onset, for the same reasons...newly diagnosed diabetes (in hospital).
LV and Coronary angiogram at 48 hours:

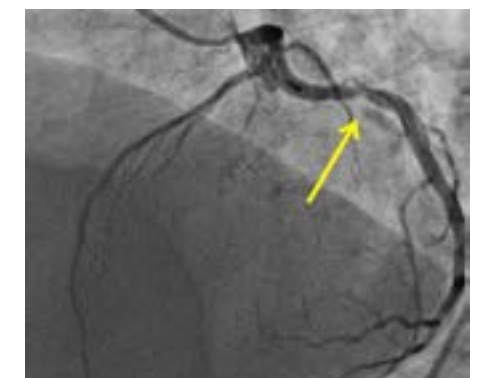
Normal global LV function moderate inferior hypokinesia



Dominant large RCA, critical mid segment stenosis, normal TIMI flow



Eccentric, 50-60 % narrowing on a large LCX (images 11-12-13), no significant lesion on LAD.



44



PCR
online

April
13th

Inkosi Albert Luthuli Central Hospital - Clinical case 3

By Jean Marco, MD, PhD, interventional cardiologist

A 53-year-old Indian lady, late presenter after anterior STEMI

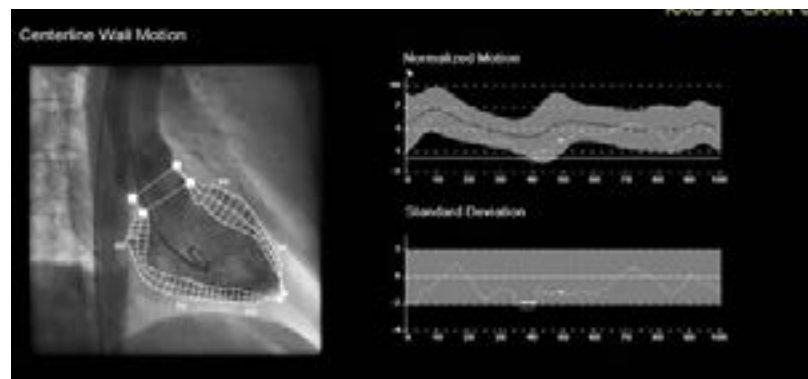
The anterior STEMI was in September 2014, no reperfusion therapy. Family history of CAD, dislipidemia.

Clinical history of COBP, osteoarthritis, possible peptic ulcer(?)

Admitted in peripheral hospital for «chest pain», CCS 1. ECG: q waves leads V2-V3

Stress test: not conclusive

LV angiogram showed: apical akinesia, EF: 55%:



Coronary angiogram: diffuse atheroma on RCA, no significant lesion:



Eccentric, 50-60% narrowing on mid LAD and osteal OM lesion (Medina 0-1-0), small OM diameter < 2mm



It was decided to evaluate the LAD lesion by FFR. FFR: 0.80, 0.85

Considering the global patient's appraisal and the co-morbidities factors (possible history of peptic ulcer, osteoarthritis with polymedication, medical treatment was decided.

Some personal comments about the use of FFR: the cost!

The hospital pay around 7,500 Rands for a wire, plus the cost for Adenosin infusion (4,000 Rands)

The cost of a DES amounts to 4,500-7,000 RDS.

So, I do not believe that FFR is cost-effective as the cost of a FFR wire is prohibitive in this country (exclusivity!).

Two other patients were admitted less than 3 hours after symptoms onset of STEMI, in hospitals without PCI capability and treated by thrombolysis. They were transferred for coronary angiogram- PCI 24-48 hours post-thrombolysis. The culprit lesions (one large RCA, and one large LCx) were patent, and succesfully treated by PCI and DES, with excellent results.

Of course, those patients are only a few examples of the cathlab and clinical activities of the week.

Pediatric cardiology interventions are frequently performed, large experience (Pulmonary Ductus Arterial closure, ASD closure, VSD closure, Pulmonary balloon dilatation...)

Other interesting interventional activity: we shared experience of mitral balloon dilatation in pregnant women presenting with severe mitral stenosis and critical cardiac status.

Some cases of EP studies and ablations, and pacemaker implantations were performed.

Every day is full with activity in the two cathlabs with a limited number of «senior cardiologists»: the fellows are learning by doing!

Every day I shared with the fellows and registrars: N-STEMI and multivessel disease, STEMI, late presenters, how to successful perform PCI by using a systematic step-by-step logical approach...and on Friday...Understanding the essentials on trials.

April
22nd

Interventional Cardiology in South Africa: Tygerberg Hospital, Cape Town

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa. This stop takes us to the Tygerberg Hospital in Cape Town.

By Jean Marco, MD, PhD, interventional cardiologist

Tygerberg Hospital in numbers

This teaching public hospital comprises 1200 beds.

The cardiology department includes:

- ICU: 8 beds
- Ward for general cardiology: 21 beds
- Radial Suite: 6 spots

The cardiology department is very well organised with many out-clinic patient activities offered.



The cardiology team includes:

- Prof Anton Doubell
- Senior cardiologists: Helmuth Weich, Alfonso Pecoraro, Charles Kyriakakis, Pieter van der Bijl, Phillips Herbst
- 5 fellows in training and one from outside South Africa
- 5 registrars in training: 1 from Bostwana and 1 in emergency medicine (new speciality) for 3 month

The cardiology department functions mostly as a “*tertiary hospital*”, with the majority of patients referred from different hospitals lacking angiogram capabilities.

Some words on the Radial Suite:

For all patients, the by-default vascular access is the radial approach (except no radial!)

Patients referred from other hospitals for acute coronary syndromes, or poor hemodynamic conditions are hospitalised in the ICU or general cardiology ward.

However, stable patients admitted for planned coronary angiograms or hemodynamic investigations are admitted in the Radial Suite, located just across from the cathlab.

It is a very fancy, comfortable and well-equipped suite (especially for a public hospital!)



There, in this very warm environment, they are welcomed, informed, «prepared» (all pre-catheterisation clinical exams, blood samples)...complete preparation!

After a coronary angiogram or a simple, uncomplicated PCI, they stay in the Radial Suite for a period of 6 hours, with supervision of vital signs, information...by a specialised Nurse...very easy for the MD, cardiologist to deliver all information, the Radial Suite is just a door away from the cathlab.

They are discharged from the hospital the same day...this is very convenient for the patients, very convenient for cardiologists and very cost-effective for the hospital.

A similar Radial Suite concept, “*First Class*” lounge concept for outpatients investigated via radial approach, was first proposed by Ferdinand Kiemeneij, the pioneer in radial approach.

As of today, this concept is not very developed in Europe.

April
22nd

Interventional cardiology in South Africa: Learning and Teaching at Tygerberg Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa. Let's discover the second installment of the visit to the Tygerberg Hospital in Cape Town.

By Jean Marco, MD, PhD, interventional cardiologist

“Strongly impressed by the investment of Professor Anton Doubell and all his team members in the learning-teaching processes”

The students, registrars, and fellows are placed at the core of the daily activities, and the necessary time for learning –teaching is scheduled, with the main goal to provide all of them with the **essentials for understanding** each necessary step, from global appraisal of clinical information at admission, thorough non-invasive and invasive key diagnosis investigations data for an optimal management for each individual patient and ... how to succeed in their final exams to be graduated.



Every morning, at 7:30 am the daily activities start with a learning-training session within the «Amphitheatre»: in a warm and friendly atmosphere, the group shares... ECG... imaging...echocardiogram... angiography...imaging...echocardiogram... angiography...

One fellow or registrar is invited to analyse data projected on a large screen, to express his/her step-by-step analysis...by applying a systematic and logic approach...he/she is encouraged...to clarify...what, why...never a negative word....never pushing...no stress...only “*please...clarify what this expressed term means...your interpretation...your definition...*”, in taking time for...giving fellows or registrars a better understanding ...and then.. “*place yourself in the position of the exam...clarify your definition on... clearer answer...make your thinking visible...*”

Students, registrars, fellows, or senior team members actively participate... true interactivity...and at the end...clear messages, synthesis...answers to the fundamentals, each member bringing his/her contribution to reach a consensus!

Focusing on the essential...practical tips and hints... the way to propose the most appropriate management for one individual patient ...and for fellows in cardiology...how to succeed!

It was for me a great pleasure, to bring my contribution to this learning-training example ...by sharing experience and knowledge on: “*The most appropriate management strategy for A patient presenting with NSTEMI: from the patient's presentation, through initial therapy, management strategy and ...how to successfully manage A patient by PCI*”...Three sessions, each of them 75 minutes... logically linked with some questions or comments raised, interactivity driven by a local case-based presentation...focusing on the essentials, and consensual messages.

These learning sessions in the amphitheatre are followed by teaching sessions with some students,

registrars and fellows in the ward, around a patient...basic semiology, how to ...what...why...some examples:

A 48-year-old lady, Marfan syndrome:

She underwent surgical repair years ago for aortic dissection... readmitted with acute chest pain, clinical lesson on bedside, basic clinical exam, revisiting the definitions on ...hands...feet...hips radio... eyes finding...remember the essential ...what is key...followed in the amphitheatre by the analyse of all imaging data in the amphitheatre...large screen.. before...after...surgery, in taking time for questions, interpretations...answers...and for the students, registrars, fellows, preparing the final exam...what could the questions be? The essentials on how to answer...this lesson was planned in the schedule of the day

A 20-year-old lady, pregnant (seventh week), presenting with septic endocarditis:

Difficult differentiation at the auscultation ...time for a fellow to analyse, and for a student to express... what is his interpretation? ...making visible his thinking... auscultation signs of a mitral stenosis plus regurgitation, frequent in South Africa? Please express ...and step-by-step...understanding ... Barlow syndrome, described in South Africa, but relatively rare... “Late end systolic murmur+ click...” and ... understanding before looking at the analysis of echo data... understanding the basic of clinical exams... and sharing the best management strategy... the differences...how to..Why...Clinical lesson for me ...back 50 years ago!

A 38-year-old gentleman, HIV positive, admitted with a massive left stroke related to septic endocarditis on mitral stenosis...

...Septic vegetation embolisation... clinical lesson ...clinical presentation...how to synthesise...from the essential, deleting the non-essential and underlying interesting point matter for questions, investigations, or better understanding..how to plan the strategy...

At the end of all these educative sessions, Professor Anton Doubell asked the student or registrar, or fellow.. “*What do you think about your performance in reporting the clinical history and your clinical exam*”...“*in your mind, what was good... what should be improved*”... and synthetic advice or comments on the most appropriate strategy for this particular patient, and also, on how to respond if the same questions, for a similar patient, are asked during the final exam!

By taking the time, (it was scheduled in the daily task!), he provides the youngest with the possibility to express, to raise questions, without pushing or stressing...and with the best respect for the patient.

And always, synthesis, messages.

Every afternoon, from 3 to 4 pm, Professor Anton Doubell, senior team member, all registrars, fellows, review of the imaging matter of debate on the best management, or matter of interest for fellows or registrars, with the same learning-training process... a better understanding on...

Always a positive, respectful approach, with as a main objective, learning-teaching on the essential to propose an optimal management strategy for one individual patient, taking into consideration a global appraisal of their clinical particularities.

April
28th

Interventional Cardiology in South Africa: Cathlab activity at Tygerberg Hospital

Sharing part of the activities within the cathlabs.

By Jean Marco, MD, PhD, interventional cardiologist

Remarks concerning the feature of coronary artery disease in patients presenting with ACS

Due to the geographical areas of recruitment of the cardiology department unit of the Tygerberg Academic Hospital, the ethnicity of the majority of patients presenting with CAD are Caucasians or Cape Coloured (mixed race).

Therefore, the features of coronary artery disease seem similar to those of the majority of European population, different those of the coronary artery disease of the Black population presenting with ACS in Johannesburg, Pretoria, and Bloemfontein (young patients, HIV positive + triple anti retro-viral therapy, presenting with thrombotic obstruction of proximal major coronary arteries), and also different from those of the Asian patient population (diabetics, small vessels, diffuse coronary artery disease, multiple lesions..) I saw in Inkosi Albert Luthuli Central Hospital in Durban.

Due to ≥ 3 gene mutations, Afrikaners frequently present a family history of hypercholesterolemia, and diffuse CAD in young patients is common.

Remarks concerning the pharmaco-invasive strategy for STEMI patients

In all the public academic hospitals I have visited, and during all the weekly SASCI evening meetings dedicated to the management of STEMI patients in South Africa, our cardiologist friends expressed the same comments: due to multiple issues (distance from living areas - the first medical contact with a GP, and/or time-consuming transportation, and/or lack of access to emergency medical transportation, and/or limited number of public hospitals with a 24/7 primary PCI facility), the vast majority of STEMI patients do not have access to primary PCI or are admitted with a late presentation.

For STEMI patients, when it is available, reperfusion therapy is most often limited to fibrinolytic therapy.

The pharmaco-invasive strategy, by integrating the combination of fibrinolytic drugs, aspirin, clopidogrel and enoxaparin, followed by routine angiography 24 to 48 hours later, may be feasible in a broader population.

Streptokinase, because of its relatively low cost, remains the most commonly utilised fibrinolytic drug.

Tenecteplase is vastly more expensive and not affordable due to the budget constraints of most public hospitals.

The main objectives of the pharmaco-invasive strategy are to try establish a reperfusion in a larger broad of early presenter STEMI patients admitted in public hospitals without a PCI facility, to expect to maintain blood flow in the infarct related artery (IRA), to optimise triage for transportation towards a hospital with a PCI facility 24 to 72 hours later, and to perform a PCI of the IRA and other vessels with critical stenosis with a more predictable PCI procedure.

This pharmaco-invasive strategy in daily practice, could be a matter for debate in interventional cardiology meetings, and a topic for a personalised lifelong transformative learning for healthcare professionals, not only from South Africa, but I am sure many countries worldwide!

Some examples of STEMI patients admitted in the cathlabs during these 5 days:

First comments: every day ≥ 2 STEMI patients treated with this pharmacological approach - followed by a systematic coronary angiogram 24-to 72 hours later! Few centres in Europe have a such large experience in this field!

April
28th

Tygerberg Hospital - clinical case: inferior-lateral STEMI

By Jean Marco, MD, PhD, interventional cardiologist

A 35-year-old Caucasian gentleman admitted in a public hospital without a PCI facility with an inferior-lateral STEMI, 3 hours after symptoms onset

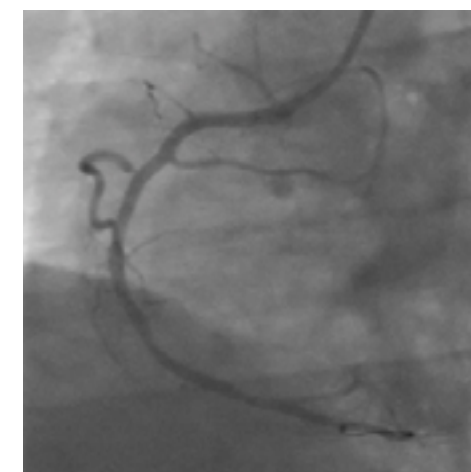
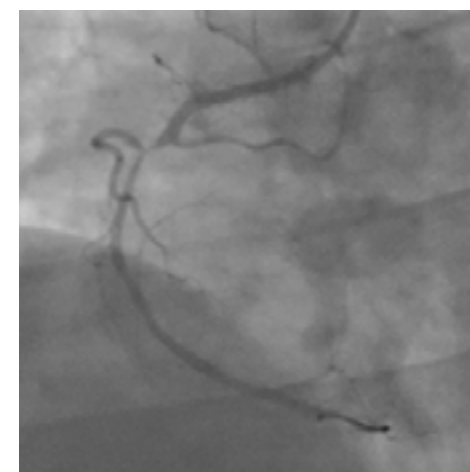
- Treatment: streptokinase infusion + enoxaparin + clopidogrel (300mg) + ASA+ beta blockers + statine
- 30 minutes later: complete STE resolution, pain-free, stable
- 2 days later: transferred for coronary angiogram
- Radial approach
- Left CA: (pictures 1 - 2)
- Distal LCX stenosis



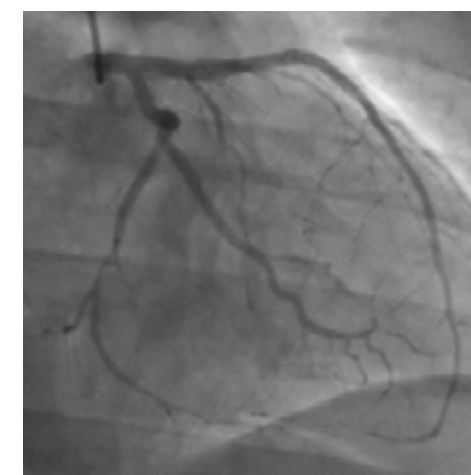
RCA: complex, long stenosis on segment II, normal distal TIMI flow:



A stable patient, allowing for the same training-learning process: under the supervision of Dr Ch. Kyriakakis, the fellow planned the strategy (plan A, plan B contingent plan, and bail-out if needed) and performed the PCI step-by-step.



- Final result after pre-dilatation (2.5 mm x 15 mm balloon) + DES implantation and optimisation of result with a 3.5 NC balloon. Normal distal TIMI flow (Pictures 4 - 5)
- Simple procedure, little contrast medium used, so it was decided to treat the distal LCX.



- Final result DES implantation and optimisation with a NC balloon. Normal distal TIMI flow.

April
28th

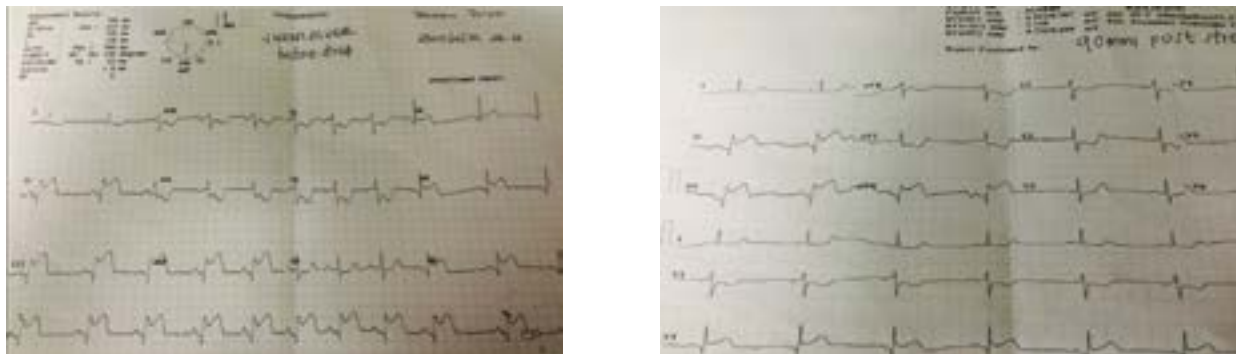
Tygerberg Hospital - clinical case 2

By Jean Marco, MD, PhD, interventional cardiologist

Example n°2: a 74-year-old lady, (ethnicity: Caucasian), COPD, hypertension, smoker+++ , hypercholesterolemia

22 April, 2015:

- admitted in hospital without PCI facility for inferior STEMI

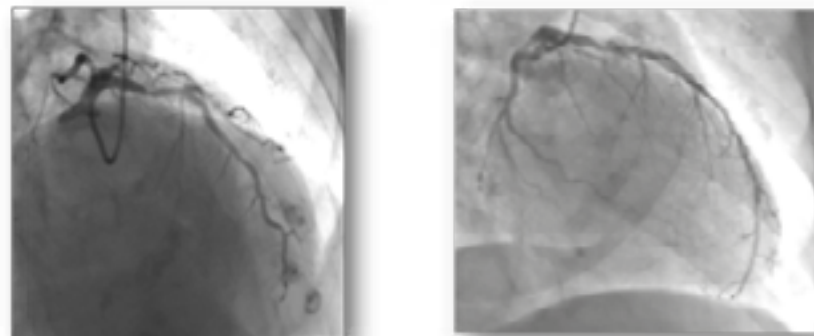


- Streptokinase infusion 3 hours after symptoms onset + enoxaparin + clopidogrel (300mg) + aspirin
- **90 minutes post infusion:** pain free, STE: incomplete resolution, clinically stable

23 April, 2015:

- Transfer for coronary angiography
- Normal clinical exam, stable, symptom free
- Coronary angiogram performed by radial approach

Left CA in multiple orthogonal views: non critical proximal LAD lesion, distal occlusion of LCx, small vessel:

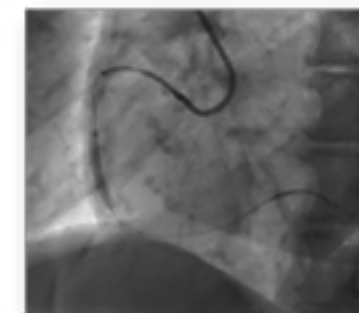


RCA: shepherd cross take-off, complex critical lesion on segment II:

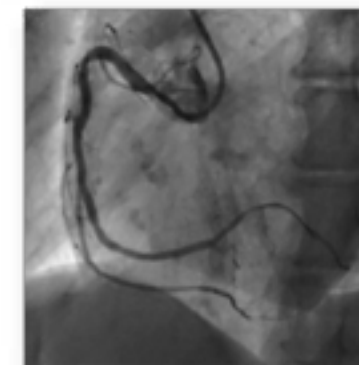


This lady is stable, clear information delivered, and ...same learning-teaching approach... the fellow planned the strategy (plan A, guiding catheter AL 0.75, Floppy G wire, 2.5x 20 mm balloon, ..., plan B: the support with the GC is not optimal, a micro cath for mother-child technique, stent...)

Plan B was applied



Final result after DES implantation and post dilatation with a NC balloon.
Good result, normal distal TIMI flow:



These two examples illustrate the efficiency of this pharmaco-invasive approach. Of course the process triage before patients transfer could explain the coronary patency at coronary angiogram performed 24 to 48 hours after administration of streptokinase, enoxaparin, aspirin, and loading dose of clopidogrel.

April
28th

Tygerberg Hospital – clinical case 3

By Jean Marco, MD, PhD, interventional cardiologist

Clinical case 3: A 54-year-old black male, smoker.

As in all hospitals...A question: *“What is the most appropriate strategy for late presenter STEMI patients?”*

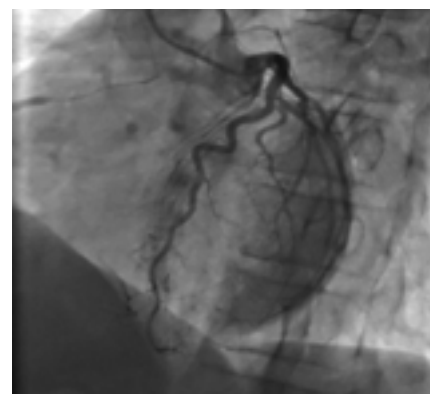
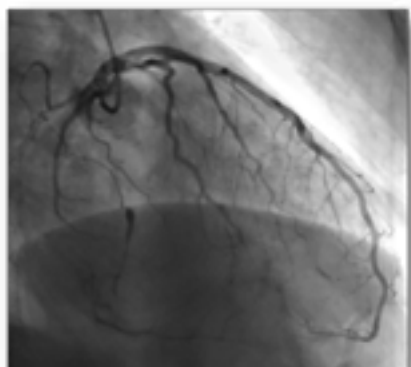
Admitted in a public hospital without PCI: late presenter inferior STEMI, Enoxaparin + Aspirin + clopidogrel (300 mg loading dose) + Betablockers+ statin.

Dynamic changes on ECG.

2 days later: Symptom free, stable, transferred for coronary angiogram, symptom free at admission. Radial approach.

Left CA: no significant lesion, L-R collaterals

RCA: occluded!

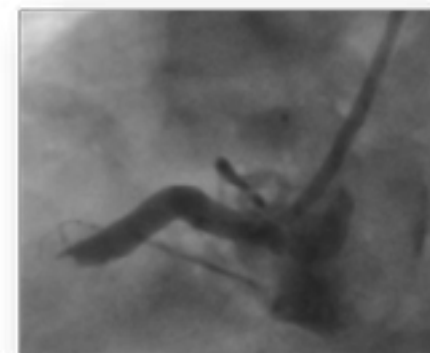


Look carefully at the collaterals! The total obstruction seems short.



Team discussion: considering the patient's particularities, a thrombus formation on the top of a moderate stenosis was evoked.

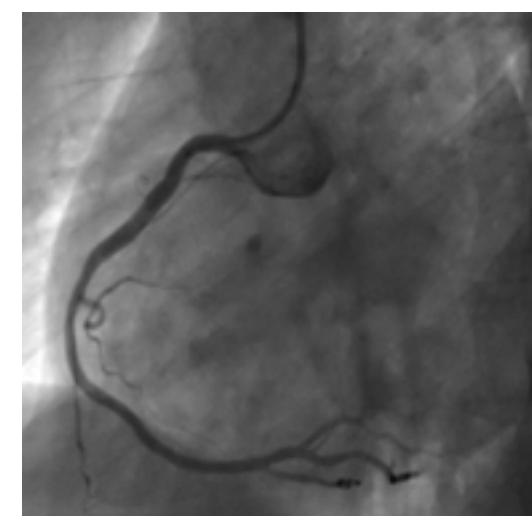
It was proposed to re-open this total occlusion, 48 hours post-STEMI



The total occlusion of RCA was easily crossed with a floppy wire, then manual thrombus aspiration.



A large thrombus burden was removed. TIMI III flow, and < 60% residual narrowing post thrombus aspiration was observed:



Final result after DES implantation and post dilatation with a 4;0 mm NC balloon
Normal distal TIMI flow, no residual stenosis.

May
4th

Interventional cardiology in South Africa: Gaining a better understanding of healthcare services at Tygerberg Hospital

Gaining a better understanding of South African healthcare services and the issues with STEMI patients.

By Jean Marco, MD, PhD, interventional cardiologist

I- A better understanding of South African healthcare services and the issues with STEMI patients

The South African public health service is divided into three levels of care:

- **Primary care** (family practitioners) and **community hospitals** (general practitioners)
- **Secondary hospitals**: with certain specialists such as specialist physicians but without sub-specialist care
- **Tertiary hospitals**: academic referral hospitals, with access to sub-specialist services such as cardiologists. These tertiary centres are usually located in large cities, resulting in inequality in the distribution of sub-specialist care.

Tygerberg Academic Hospital (TBH) in Parow, Cape Town is one of two academic referral centres in the city. It provides a tertiary service to about 2.64 million people.

The Division of Cardiology within the Department of Medicine at TBH manages all ischemic chest pain and has 28 beds with four full-time cardiologists.

The studies on which the ESC Guidelines are based may not be applicable to a broad number of South African patients, even to those presenting primarily to sub-specialist centres.

The optimal timing for angiography and access to in-patient angiography remains a scarce resource, with 4 cardiologists in the Division of Cardiology, Department of Medicine at TBH providing a tertiary service to a population of 2.64 million. This inequality in access to in-patient invasive management needs to be addressed as a priority.

II- Sharing together two examples of pharmaco-invasive strategy admitted on 28 April

- Example 1: a rescue PCI for a young lady, born 1979, mixed ethnicity, diabetic, central obesity
- Example 2: a patient who received a streptokinase infusion late (6 hours) after inferior STEMI

III-Tuberculosis and pericardium disease

During these few days in the cathlab of the **Tygerberg Academic Hospital**:

Two young patients (HIV positive, anti retroviral therapy) underwent pericardiocentesis+ pericardial

angioscopy +biopsy... tuberculosis is frequent mainly in those frail patients.

One young patient was investigated post constrictive pericarditis (tuberculosis).

In all SA, tuberculosis is a major concern in frailty and poor population, mainly but not only, in HIV positive patients treated with anti-retroviral therapy.

IV- An now, sharing together the story of a patient with a stabbed heart!

- Example 3: a patient with a stabbed heart

V- Some words on my participation in Learning-training

Practical advice in the cathlabs, and practical lectures on “The Essentials on...Personalised medicine... Understanding the essentials beyond clinical trials allows to improve our decision making-process for each individual patient...”

I really appreciated the exchanges between team members, registrars, fellows...always in a very friendly and open-minded atmosphere...with as main objective...teaching-learning.

VI- Thursday 29 of April: evening SASCI session on ...STEMI

Well-organised and attended...around 50 participants, from different hospitals in the area, open-minded discussions on...the best use of the pharmaco-invasive approach for STEMI patients...when and how to perform PCI...the best use of manual thrombus aspiration...tips and hints for a successful primary PCI.

Again, a great experience , I learnt from my SA peers, and...from fellows!

What I will retain from this experience in the Tygerberg Academic Hospital, Parow, Cape Town

Prof Anton Doubell and his team (Pieter van der Bijl, Phillips Herbst, Charles Kyriakakis, Alfonso Pecoraro and Helmuth Weich) are applying fantastic teaching/learning processes!

Starting every morning with a scheduled programme focusing on education, varying from ECG, imaging, clinical case discussion, placing students, registrars, fellows into the core of their activities and tasks, providing them with the opportunity to analyse, express and share points of views, learn by doing,, and finally providing them with clear messages.



They place the registrars and fellows in the exam situation, without pressing them, in a relaxed and friendly atmosphere, and so, they provide them with the best for success!

It is currently, from my experience, the best in-hospital teaching team and processes I saw.

May
5th

Example 1: a rescue PCI for a young lady, born 1979, mixed ethnicity, diabetic, central obesity

By Jean Marco, MD, PhD, interventional cardiologist

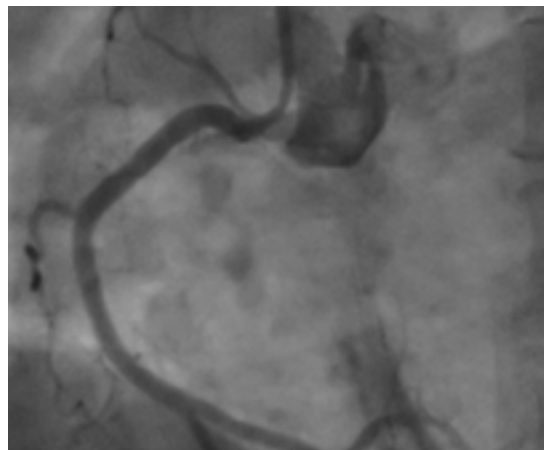
A young lady, born 1979, (Ethnicity: mixed), diabetic, central obesity

27/04/15, 10 pm: admitted in a secondary hospital with anterior STEMI: dtreptokinase + enoxaparin + aspirin+ 300 mg of clopidogrel

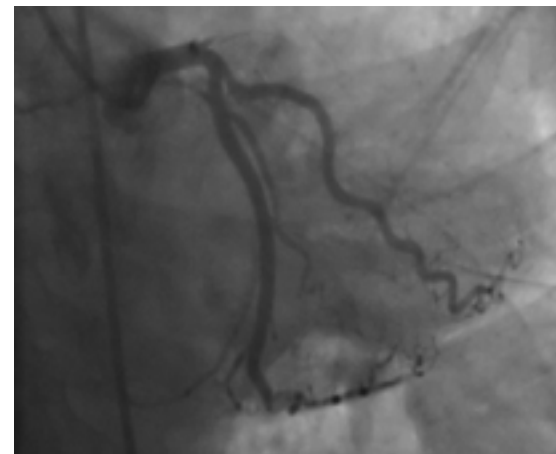
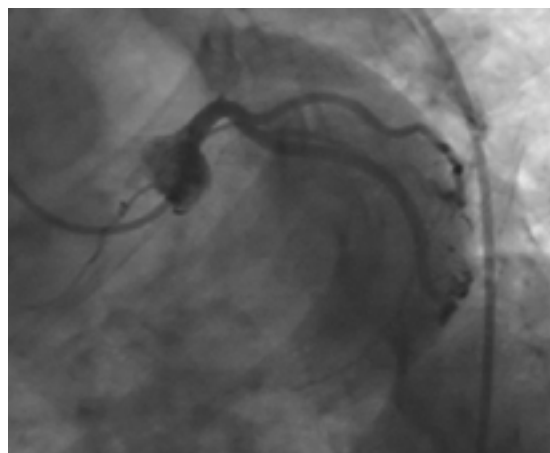
90 minutes later, persistent ST-Elevation and pain

Transfer to TH, coronary angiogram (trans- radial approach), 12h after symptoms onset, persistent chest pain and ST-Elevation, stable hemodynamic status

Picture 1: normal RCA

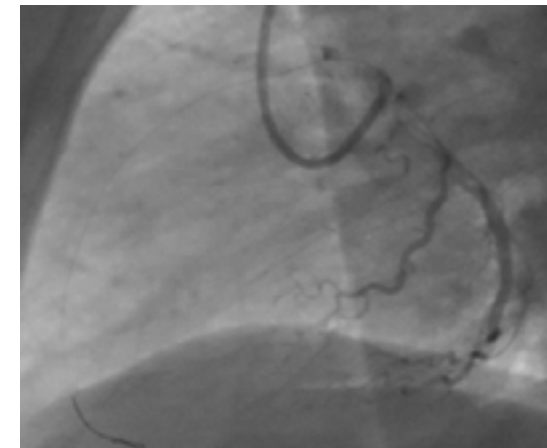


See pictures 2 and 3: true ostial LAD occlusion!

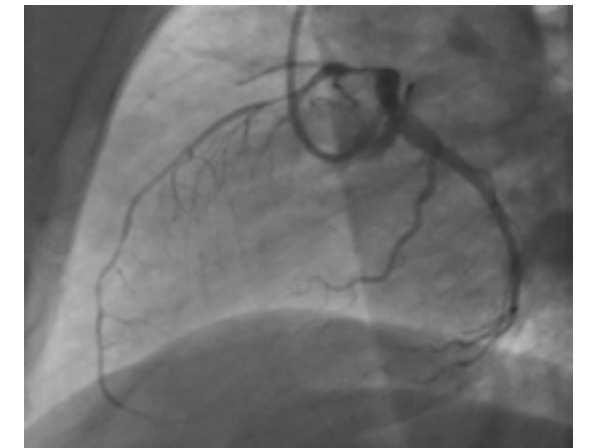


Question: for this particular young lady, 12 hours after symptoms onset, fibrinolysis failed. Is a rescue PCI still a valid option? Please, express and share your point of view!

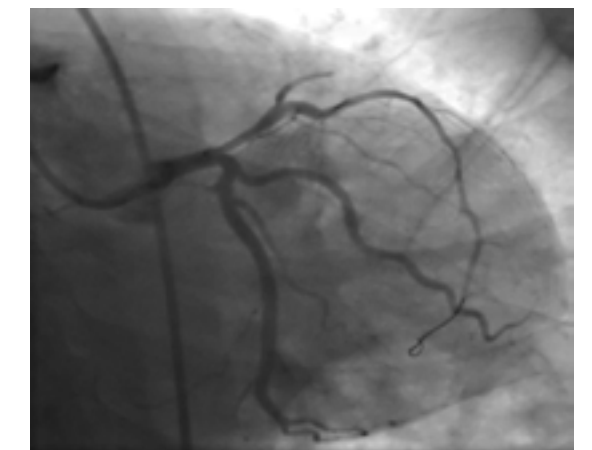
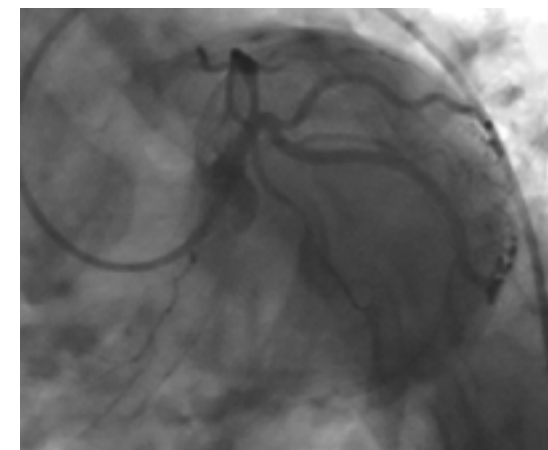
LAD obstruction crossed with a floppy wire:



See result after thrombus aspiration:

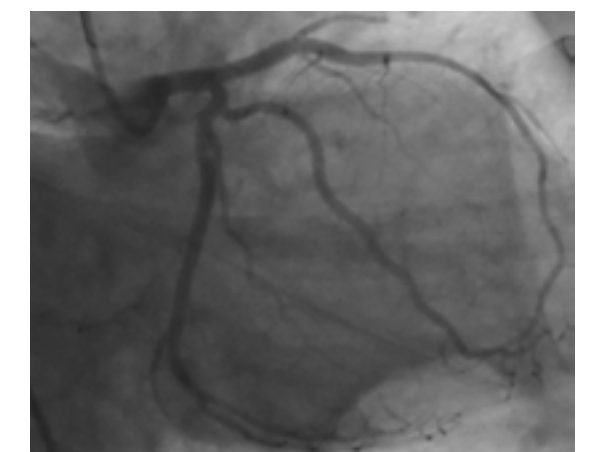
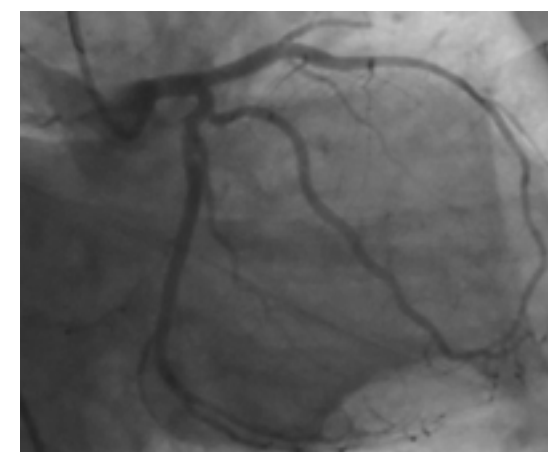


A DES was precisely placed to cover the distal left main and the proximal LAD.



After DES deployment, POT with a 4.0 mm balloon, and opening of the stent struts with a 3.0mm balloon placed 1 mm within the LCx.

Pictures 8-9: Excellent final result, normal TIMI flow, ST-Elevation and pain resolved



Example 2: a patient who received a streptokinase infusion late (6 hours) after inferior STEMI

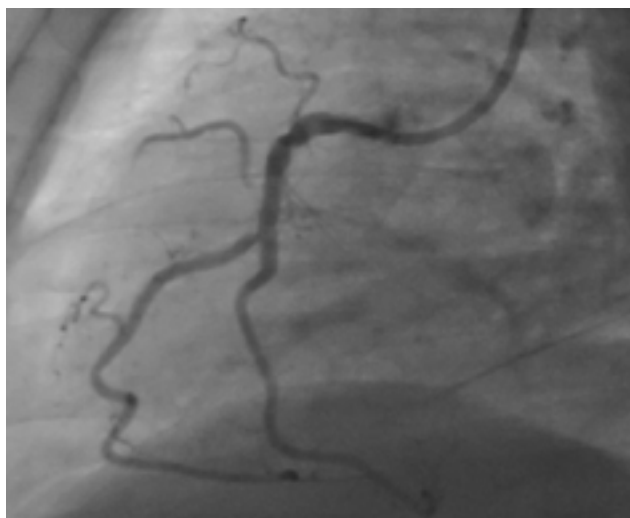
By Jean Marco, MD, PhD, interventional cardiologist

A male, born 1953, (ethnicity: black), smoker, was admitted in a Community Hospital on 24/04/15 with a inferior STEMI...no fibrinolysis... then transfered to a Secondary Hospital wher he was treated with Streptokinase 6 hours after symptoms onset, + enoxaparin + aspirin+ 300 mg of clopidogrel.

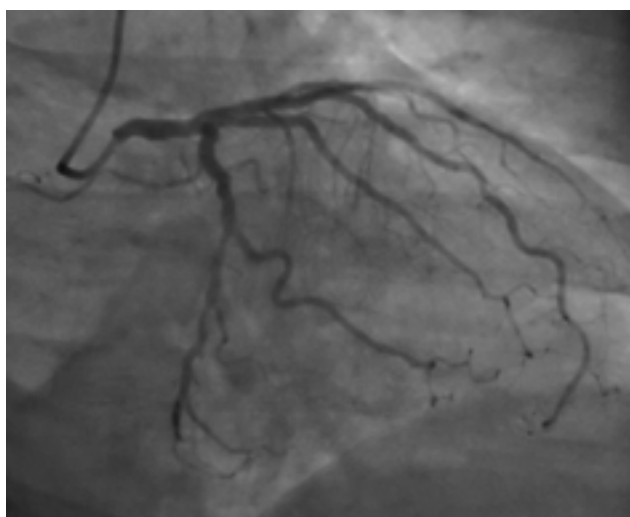
60 minutes later, ECG ST-E and pain were resolved

28/04/15 (Two days later), stable, he was transferred to TH for coronary angiogram.

Picture 1: Left CA, diffuse, non obstructive atheroma on LM stem, LAD, diagonals, LCx, OM, and distal LCx obstruction



Picture 2: RCA: critical, short, obstructive lesions, followed by two important large bifurcation braches

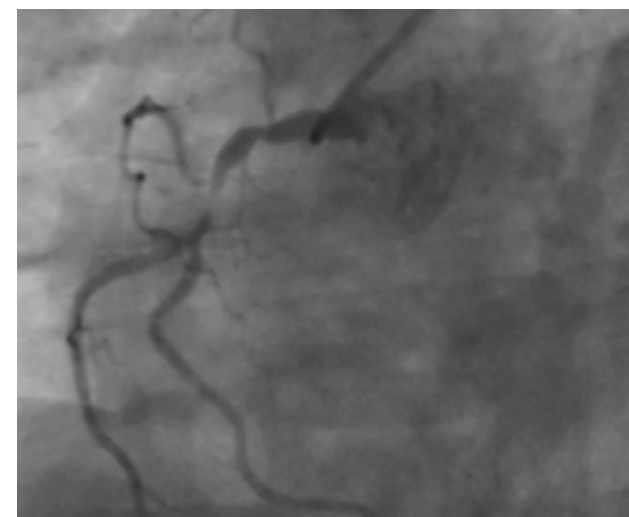


Do you propose 'ad hoc' PCI for this particular STEMI patient, 48 hours after late (>6hours) fibrinolysis?

Pro and contra points of view were debated between the senior cardiologist and fellows, and PCI was decided....team consensus!

The technical strategy was shared (plan A and B)...learning/ teaching process!...clearly defined...2 wires, provisional single DES strategy...

Picture 3: See the excellent final result



These two new examples illustrate the issues of access to treatment and coronary angiograms for patients presenting with STEMI, and the rationale for the use of a pharmaco-invasive strategy.

Every day, 2-3 patients referred for investigations post STEMI are treated with this approach:

- **Triage:** most of the patients were referred after successful thrombolytic therapy: this is due to the **upstream triage process**...not all patients are transferred from secondary hospitals to tertiary hospitals, and not all patients have access to coronary angiograms during the 10-15 days following STEMI.
- **NSTE-ACS:** During my stay in the Tygerberg Academic Hospital I saw many NSTEMI-ACS patients who underwent coronary angiograms referred from secondary hospitals after triage.

Triage of those patients is a major concern even after shared protocols.

The recommendations of the ESC Guidelines on the management of NSTEMI-ACS may not be applicable to a broad number of patients, even to those presenting primarily to sub-specialist centres.

The optimal timing for angiography and access to in-patient angiography remains a matter of concern.

The data published in the Cardiovascular Journal of Africa ■ vol 24, no 4, may 2013 (: Moses J. et al: Non-ST elevation myocardial infarction (NSTEMI) in three hospital settings in South Africa: does geography influence management and outcome?) illustrate the problems. There were clearly differences in mortality between the patients according to triage!

May
5th

Example 3: a patient with a stabbed heart

By Jean Marco, MD, PhD, interventional cardiologist

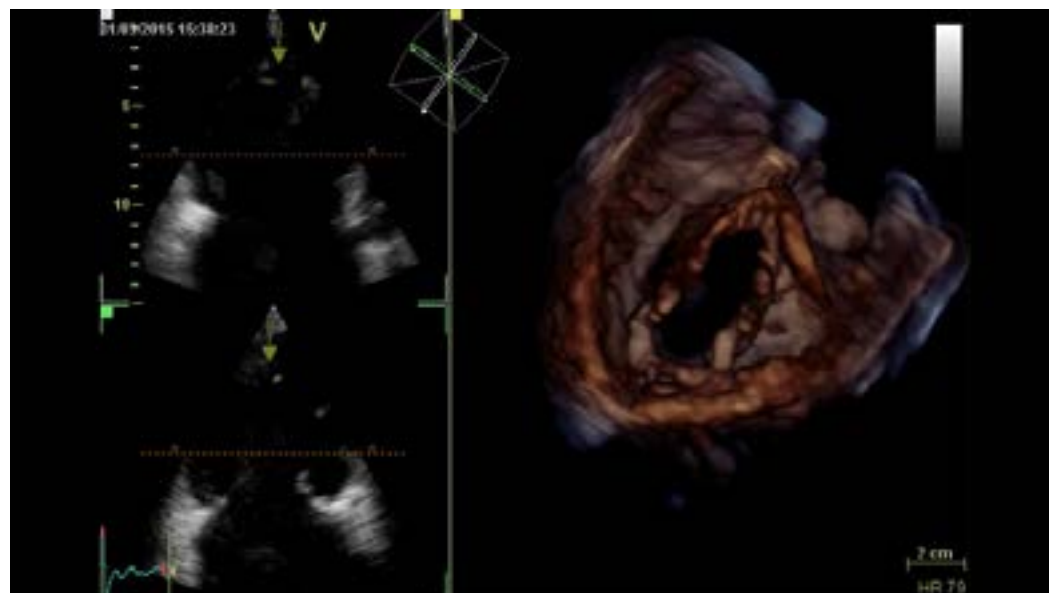
IV- And now, sharing together the case of a patient with a stabbed heart!

A young gentleman was admitted in 1999 after a knife stab in the heart area. He was successfully treated by the cardiac surgeons team...! Experience...violence is a major concern! Planned in-hospital admission on 20 April 2015 for heart failure symptoms.

Picture 1: see the scars and the direction of the knife stab (arrow)



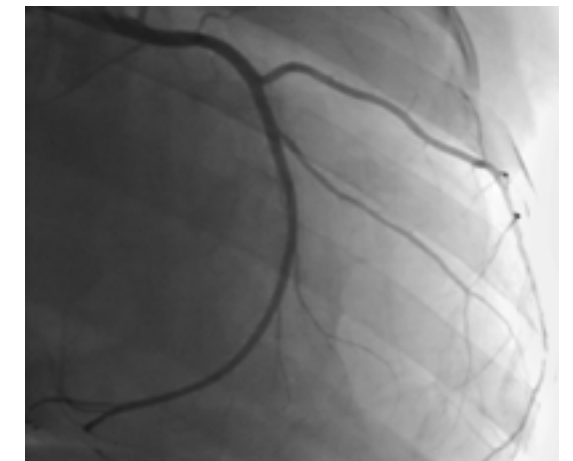
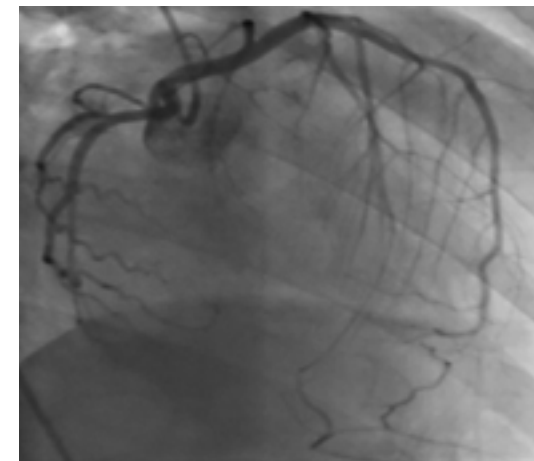
Now looking to the 2 and 3D echocardiograms



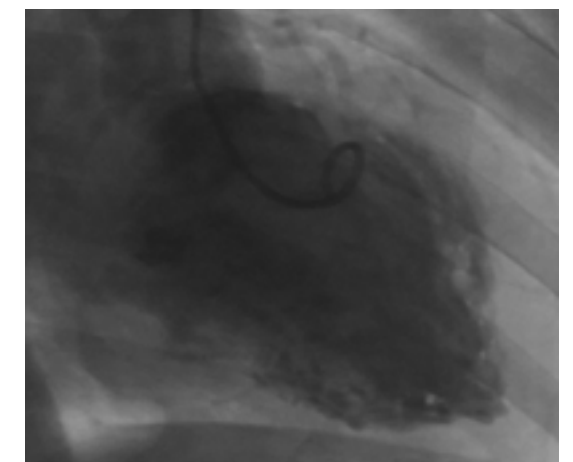
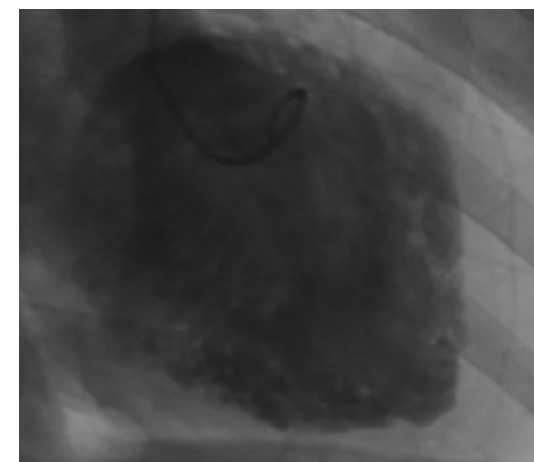
The tricuspid valve was cut by the knife and is now 'flatting' with as a consequence a severe tricuspid insufficiency !

See the arrows on the coronary angiogram:

the distal RCA branchwas severed by the knife blade!



Dilatated and depressed LV



May
28th

Interventional Cardiology in South Africa: Groote Schuur Hospital

Join Jean Marco, PCR Honorary Chairman, during his day-by-day trip through South Africa. This stop takes us to the Groote Schuur Hospital.

By Jean Marco, MD, PhD, interventional cardiologist



The Groote Schuur Hospital, University of Cape Town (UCT), one of South Africa's premier hospitals, is renowned as the training ground for some of South Africa's best doctors, surgeons and nurses.

In December 1967, a young UCT educated surgeon named Dr Christiaan Barnard, completed the world's first successful human heart transplant in this hospital.

As an academic health centre, Groote Schuur Hospital mission is *"to strive to provide outstanding tertiary and quaternary care for the patients of the Western Cape and beyond and to promote excellence in teaching and research."*

The Division of Cardiology is the oldest dedicated clinical cardiology unit in sub-Saharan Africa. It has a rich history and tradition of delivering best-class clinical service, of teaching and training Africa's leading cardiologists, as well as some international ones, and of making significant contributions and efforts to improve local national, and international cardiovascular health.



Mpiko Ntsekhe

Professor Mpiko Ntsekhe the head of Cardiology Division, part of the Department of Medicine, expresses his vision as follows:

"Clinical medicine, teaching, research are the most exciting aspect of my daily tasks.... I would like to create a simple legacy of running a department that consistently finds solutions that allow it to provide best patient care, teaches and trains to the highest standards and contributes to solving the major problems countries face through research".

His team includes:

- **3 Senior consultants:** B. Cupido, S. Pandie, A. Chin, who work full time, and share all the tasks
- **4 Fellows:** N. Ntusi, K. Moeketsi, P. Ntuli, M. Chhiba (even though they participate in all activities, the fellows rotate their training every week (cath-lab, echo, electrophysiology, clinic)
- **5 Internal Medicine trainees** (rotating every 3 months)

The aims of the division of cardiology are:

- *"Retaining, recruiting and training a team of cardiovascular health care professionals who are dedicated to clinical excellence and public sector health care and who are conscious of the prevailing conditions and environment*
- *To make targeted improvements within the system of health care to address issues of access for patients, contribute to teaching and training (the division of cardiology receives non-resident trainees from around the country and the African continent), and work closely with the Hatter Institute For Cardiovascular Research in Africa. Its research and projects are geared to consolidate and expand the existing efforts to combat cardiovascular diseases and improve the overall prosperity in Africa"*

The Division of Cardiology works as *"a tertiary referral centre"*, based on a networking hub with secondary hospitals in the region, and the standard of care is very high.

The facility includes:

- ICU: 6 beds, with a fast turn-over
- Walk-in patients: 12 beds (including 6 lukewarm beds)

The Clinical Skills Centre is one of the fast-growing entities in the faculty of Health Science providing simulation training in the Faculty of Health Science, and simulation training to all medical and allied health programmes at the University of Cape Town.

I had the opportunity to share a very enriching moment with Rachel Weiss, Director of Clinical Skills Centre! Thank you again to all involved!

Aug.
14th

ViTAL programme will transform continuing medical education in South Africa

By Jean Marco, MD, PhD, interventional cardiologist

For 25 years, Europa Organisation has been a leading specialist in the organisation of medical congresses. It recently expanded its activities to Africa with the establishment of Europa Organisation Africa. One of the new entity's key first initiatives, in partnership with PCR, has been to bring the ViTAL postgraduate adult/learning training programme to South Africa.

ViTAL is a unique programme of personalised lifelong transformative learning for healthcare professionals aimed at «*training the trainers*». While it has focused mainly on interventional cardiologists elsewhere in the world, it has broadened its focus in South Africa to other specialties. The first ViTAL seminar/workshop in South Africa took place in February and was attended by 18 participants, all of whom responded very positively to the initiative.

ViTAL was first implemented four years ago, further to its development by Magali Breheret, Allan Spencer and Professor Jean Marco, the founder of PCR. The principles underlying it have informed the latter's entire working life, however. Its name is derived as follows: 'Vi' = visionary; 'T' = transformative; 'A' = adult; and L = learning. Its main objective is to share its founders' long-term vision, experience and knowledge in the field of postgraduate education/training – and make a 'vital' difference to the quality of continuing medical education (CME). Sharing innovative concepts will enable the successful implementation of postgraduate education/training sessions adapted to the future needs of healthcare professionals by linking content to their daily activities, while taking into account local constraints and cultural differences.

Professor Marco elaborates as follows. *"Over the last 40 years there has been a dramatic exponential increase in the amount of information available to medical professionals, driven in large part by the expanding role played by technology. Today, they potentially have access to such vast amounts of data that it is impossible to read everything that is published."*

"At the same time the 'curve' in respect of the science of education has been very flat – with the result that much of this explosion of information is not being shared effectively with the greater medical community. ViTAL therefore aims to integrate the science of adult learning with the learning process itself."

Professor Marco underscores that postgraduate adult learning as a healthcare professional is very different from medical school student learning. *"It's important that what an individual is learning is what they need to know to optimise the care they give their patients, not what a teacher or professor assumes they ought to know."* ViTAL therefore places a great emphasis on assessing each individual's needs and aligning the objectives of the education process with them – 'needs' is the key word in the ViTAL philosophy. *"We believe in acting locally to meet specific needs,"* says Professor Marco. *"For example, the requirements of a doctor working in a public hospital in Johannesburg will be very different from those of one working in a private hospital in France. So we first need to understand where the participant stands in respect of current experience and where they want to be at the end of the CME process."*

ViTAL thus reverses the traditional 'top down' approach whereby a professor decides what to teach and

how to teach it. *"Adults learn by doing, so the learning process needs to be linked to their daily experience. To this end, ViTAL emphasises the 'what', 'why' and 'how' by assessing participants' expectations, focusing on practical problem-solving rather than theory and by placing the learner at the core of the process in such a way that they are both source and recipient of the education. The process is every bit as important as the content,"* he says.

ViTAL employs multimedia modalities to achieve its aims – combining language, gesture and movement along with visual and audio media. In addition to physical meetings/sessions, PCR also offers online ViTAL web courses and the two activities complement each other. *"Generating engagement and interactivity is key to ensuring that the participant is at the core of the process at all times. The learning process is also a personalised and lifelong one in that once the defined objectives of a particular session or module have been achieved, it inevitably leads to the identification of new needs and the requirement of new learning processes. In this way we set up a continuum of lifelong, personalised and transformative learning,"* concludes Professor Marco. His parting words for future ViTAL participants: *"Our role is to open your eyes while standing in your shoes!"*