

## Cardiovascular News

# Enhancing cardiovascular skills development in Africa: Khartoum first PTMC workshop

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The African continent continues to face unique challenges in the management of the cardiovascular pandemic, largely because of the exponential increase in coronary and degenerative heart diseases, but also because of the persistence of rheumatic heart disease.<sup>1</sup> This combination of disease and the limitation of resources, both manpower and economic, means systems must adapt in order to optimise care to this diverse population.

The training of cardiologists in Africa is one of the challenges systems grapple with. Some countries have locally developed programmes, whereas others rely on external training and skills development.

### Training within the continent

Whereas training in Europe and America exposes one to high-quality training with the latest science, training in rheumatic heart disease remains limited. This skill can be obtained from India, which has a disease mix that mirrors Africa, but there are challenges, particularly with the onset of the corona virus pandemic.

Transfer of skills within the continent offers easier, more affordable training for African cardiologists in a similar healthcare setting, with similar challenges and resources, especially for conditions prevalent in Africa, such as rheumatic mitral stenosis, which continues to plaque young patients, with the resultant poor quality of life and premature mortality.<sup>2,3</sup>

With many interventional cardiologists practicing on the continent, we envisioned skills acquisition in percutaneous mitral commissurotomy (PTMC), also known as balloon mitral valvuloplasty (BMV) to be feasible. This effort was endorsed by the Sudan Heart Society, PASCAR (Pan-African Society of Cardiology) and its daughter society, PASCI (Pan-African Society of Cardiovascular Interventions).

PASCAR has previously endorsed a similar intra-continental hands-on training programme for pacemaker implantation.<sup>4</sup> Indeed, an article published in the *South African Heart Journal*

recommends the upgrading of cardiology training to include new skills in imaging (cardiac computed tomography and cardiac magnetic resonance imaging) to practicing cardiologists and having them be part of a cardiology fellowship training curriculum.<sup>5</sup>

### Outline of the workshop

The workshop was conducted at the Sudan Heart Center, located in the capital city Khartoum, from 25–27 March 2021. The workshop was CME-accredited by the Sudan Medical Council and endorsed by PASCAR, PASCI and the Sudan Heart Society. The main trainer was Ahmed Suliman. Trainees were a cardiologist from the Aga Khan University hospital, Dr Mzee Ngunga, who had prior experience in PTMC using the multitrack balloon, a catheterisation laboratory (cath lab) nurse from the same institution, Julina Mangene, and a local cardiologist, Dr Mujahid Mohammed, who had prior basic experience with the Inoue technique PTMC.

Training was hands on, with the trainee as first operator, under guidance of the trainer as second operator. The trainee nurse also scrubbed as an assistant and was supervised with balloon preparation and inflation during the procedure. Surgical back-up was available at the time of the procedure. The trainees performed trans-septal puncture using a Brockenborough TM needle and valvuloplasty was performed using an Inoue-like SYM BMV balloon from SYM Medical (China).

The cath lab was a Toshiba biplane, which facilitated simultaneous anteroposterior and lateral views during trans-septal puncture. Transthoracic echocardiography was performed after each balloon inflation to assess splitting of the mitral valve and degree of mitral regurgitation, if any.

The workshop was three days. Patients were examined clinically and counselled prior to the procedure. Transthoracic and transoesophageal echoes were viewed, and equipment preparation and procedure planning was done by the whole team.

All procedures were performed under local anaesthesia with fluoroscopy guidance only. Six cases were performed. Table 1 outlines the characteristics of the different patients.

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Table 1. Characteristics of the patients

| Case no. | Age (years) | Gender | Residence by state | Wilkins score | Transmitral gradient before PTMC (mmHg) | Transmitral gradient after PTMC (mmHg) | Immediate complications |
|----------|-------------|--------|--------------------|---------------|---|--|-------------------------|
| 1        | 29          | F      | Jazeera            | 9             | 19                                      | 3                                      | None                    |
| 2        | 58          | F      | Jazeera            | 10            | 15                                      | 5                                      | None                    |
| 3        | 27          | F      | N Kordofan         | 9             | 30                                      | 11                                     | None                    |
| 4        | 22          | F      | W Kordofan         | 8             | 30                                      | 5                                      | None                    |
| 5        | 54          | M      | Jazeera            | 8             | 15                                      | 5                                      | None                    |
| 6        | 19          | F      | Darfour            | 9             | 26                                      | 5                                      | None                    |

### Prospects for the future and remaining challenges

PTMC is a procedure that should be available in any major cath lab on the continent. For the future we propose that similar workshops should be conducted to expand and consolidate PTMC skills among local cardiologists. To further enhance the experience, we propose the following recommendations:

- Two categories of trainees should be identified. The first would be experienced interventional cardiologists with prior experience in PTMC but who require further training, and these could be first operators, with experienced trainers as the second operator. The other category would be interventional cardiologists with no or limited exposure to PTMC and these could assist with the procedure and acquire basic training that would allow them to obtain further training in their own institutions.
- A didactic basic knowledge syllabus has been drawn up, which trainees must review before the workshop. A step-by-step visual guide has been prepared that includes criteria for patient selection, echocardiographic assessment of the mitral valve, role of transoesophageal echo, review of the equipment, how to perform trans-septal puncture, balloon preparation, mitral valve dilatation, procedural haemodynamics and possible complications.

The workshop should be followed by a mentorship period in their own institutions. We propose at least 20 cases as first operator before becoming independent. The use of telemedicine for challenging cases, either in the selection phase or during the procedure, can also be utilised.

Several challenges remain in the face of advancing PTMC training and development on the continent. Financial support for trainees to cover travel and accommodation costs, as well as institutional charges is one challenge. Support of the industry for rheumatic heart disease interventions may not be as strong and forthcoming as would be expected for other cardiac procedures. Ensuring that trainees would be able to secure the required consumables and number of patients in their own institutions to maintain their skills, as well as the issue of cardiac surgery back-up during the procedure is another challenge.

Although it is important to train cardiologists in Africa in the older traditional techniques, as these are the available resources, it is important to incorporate newer technology and multimodality imaging for the future, especially the use of three-dimensional (3D) and 4D echocardiography.<sup>5</sup> Traditionally, 2D echo has been the mainstay for the diagnosis and follow up for patients with mitral stenosis. Given the complexities of the procedure we believe 3D echo imaging will enable better imaging and assessment of the mitral valve pre-, during and post procedure.

This therefore calls for more collaboration between the old and new: mitral stenosis meeting new technology in the form



Dr Ngunga (left) is first operator, supervised by Dr Suliman.

of 3D and 4D echo. Indeed, geometry and mitral valve volume can be assessed more accurately by 3D echocardiography, giving clinicians the extra edge required to refine patient outcomes.<sup>6</sup> Real-time 3D echocardiography has been shown to be highly useful in atrial septal puncture, providing an accurate and safe access to the fossa ovalis floor and its immediate margin of the rim.<sup>7</sup>

### References

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