Cardiac surgery for advanced rheumatic heart disease in Rwanda

Rheumatic heart disease (RHD) is an acquired cardiac disease that can arise from untreated streptococcal pharyngitis. Often thought of as a disease of poverty and childhood—when access to education, infrastructure, medical facilities, and care is poor—this largely preventable disease has become a major cause of morbidity, incapacity, and death. Whereas enhanced socioeconomic conditions and population-based prevention strategies have decreased if not completely absolved developed countries of RHD, low-income and middle-income regions, such as those in sub-Saharan Africa, are still highly burdened with the disease.

In Rwanda’s public sector, there are only four native cardiologists (two paediatric and two adult), supported by health-worker colleagues, to serve a population of more than 10 million. Although candidates are being identified to pursue advanced cardiology and cardiac surgery training, it will be 3–5 years before these individuals might avail their services to the country.

In November, 2006, the Rwandan Government began to decentralise chronic care for non-communicable diseases, including cardiovascular conditions, placing RHD eradication as a national priority. Aligned with this target, a collaborative effort was initiated between the Rwandan Ministry of Health, the Rwanda Heart Foundation, and four international humanitarian organisations to address the escalating cardiac disease burden. The first team in the country was Open Heart International from Australia in 2006, followed by Chain of Hope Belgium in 2007. Team Heart Inc from Boston, MA, USA and Healing Hearts Northwest from Spokane, WA, USA completed the partnership in 2008 and 2010, respectively.

These four teams—in partnership with the Rwandan Ministry of Health and King Faisal Hospital, Kigali—have collaboratively shown the feasibility of modern cardiac surgery in Rwanda. More than 400 patients have received cardiac interventions, including 330 heart surgeries (178 children and 152 adults), most for valve repair or replacement in patients with class III or IV heart failure. The Chain of Hope team has also done 79 paediatric interventional catheterisations. Other patients have received pacemakers, had pericardectomies, or received minor cardiac interventions (table).

The development of decentralised follow-up care for this growing cardiac population has now emerged as a priority, and integrated chronic-care clinics have been established at some teaching and district hospitals. The goal of the Rwandan Ministry of Health is to expand screening, diagnosis, and prevention capabilities at these specific points of care, with the inclusion of cardiac teaching from visiting cardiologists, implementation of a rigorous cardiology diploma programme for general practitioners, and the training of local personnel in essential diagnostic skills (ie, cardiac echocardiography) to extend the reach of services provided and foster eventual eradication of RHD.

Consistent with these efforts, the goals of the international partnership have evolved towards the vision of establishment of a domestic self-sustaining, comprehensive cardiovascular programme, with the capacity to independently provide cardiac surgery and perioperative care. All teams are committed to training and to skills transfer—eg, Chain of Hope Belgium has sponsored the training of two cardiologists, one anaesthetist, and one intensivist in Belgium. Team Heart Inc and Healing Hearts Northwest have contributed financially to support of the country’s first cardiac surgery nurse coordinator. Nursing staff and ancillary personnel have received training in and out of the operative theatre from all of the teams. Additionally, Team Heart Inc provides mentorship and support to a young Rwandan who is training in general and cardiothoracic surgery in South Africa. The Rwandan Ministry of Health is also committed to supporting more local clinicians, nurses, and ancillary support staff to provide expert cardiac care by sending a full team abroad for specialised training, which will augment these efforts of sustainability.

As nationwide screening, prevention, and diagnosis programmes gain momentum, for the moment, this

<table>
<thead>
<tr>
<th>Year of programme inception</th>
<th>Open Heart International, Australia</th>
<th>Chain of Hope, Belgium</th>
<th>Team Heart, Inc., Boston, MA, USA</th>
<th>Healing Hearts Northwest, Spokane, WA, USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year established in Rwanda</td>
<td>2006</td>
<td>2007</td>
<td>2007</td>
<td>2007</td>
</tr>
<tr>
<td>Case mix</td>
<td>Congenital and acquired/primarily paediatric RHD</td>
<td>Congenital /primarily paediatric RHD</td>
<td>Acquired/primarily adult RHD</td>
<td>Congenital and acquired/primarily adult RHD</td>
</tr>
<tr>
<td>Number of cases completed up to January, 2014</td>
<td>155 open</td>
<td>79 catheterisation, 23 open</td>
<td>86 open</td>
<td>66 open</td>
</tr>
</tbody>
</table>

Total cardiac surgery experience in Rwanda=421 (including minor cardiac procedures—eg, pacemaker implantation).

Table: Cardiac surgery programmes in Rwanda
international partnership represents an innovative approach to provision of cardiac surgery for patients in great need, along with investment in the longevity of comprehensive cardiovascular care for all of Rwanda and the surrounding region.

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