CARDIAC SURGERY IN AFRICA: HOW FAR?

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CHALLENGES IN CARE FOR PEDIATRIC AND CONGENITAL HEART DISEASES IN WEST AND CENTRAL AFRICA (SUB SAHARAN AFRICA)

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HISTORICAL NOTE

1953: John Gibbon (1903-1973) in Philadelphia (USA)

performed the first successful open heart surgery

supported by Cardio Pulmonary Bypass.

He repaired an Atrial Septal defect using a Pump Oxygenator
Vascular surgery at Ibadan: Experience at the University College Hospital, Ibadan

Oluwole A. ADEBO, M.B., B.S., F.W.A.C.S.*
Oluigbearo OSINOWO, M.D., F.W.A.C.S.*
Samuel A. ADEBONOJO, M.D., F.W.A.C.S.*
Isaac A. GRILLO, M.D., F.W.A.C.S.*

INTRODUCTION

Open-heart surgery has become a routine clinical procedure in some hospitals in the developed countries of Europe, America and Japan. But in most developing countries of Africa, it is yet in its early infancy. A historical landmark was made at the University of Nigeria Teaching Hospital (UNTH), Enugu in January 1974 when the first open-heart surgical operation was performed [1]. Since then, similar surgical programmes have been started in some other African centres such as Nairobi [2], Ibadan [3], Khartoum [4] and Abidjan [5].

The problems of heart surgery in Nigeria have been highlighted elsewhere [6]. In this paper, we wish to review specifically our initial experiences with open-heart surgery in our Unit, and to discuss the future prospects of this essential surgical procedure in Nigeria.
Univentricular heart with restrictive bulbo ventricular foramen

Dr AGHAJII, M.A.C., M.S.C., F.R.C.S., Dr LITWIN, S.B., M.D.

SUMMARY

We report here the case of an 8 year old male patient with single ventricle associated with obstructed anterior subaortic outlet chamber. He was surgically corrected by prosthesis pulmonary arterial–aortic connection and application of modified Fontan procedure. Preservation of the pulmonary valves during palliative procedures for univentricular heart and related defects is highlighted.
Development of Open Heart Surgery in West Africa

A Historical Perspective

Samuel A. Adebonojo
## Pioneers of Open Heart Surgery in West Africa (1960-2007)

<table>
<thead>
<tr>
<th>Country</th>
<th>Population as of 2007 (million)</th>
<th>Number of CT Surgeons Past &amp; Present</th>
<th>Number of Active CT Surgeon as of 2007</th>
<th>Year OHS Established</th>
<th>The Pioneers</th>
<th>Present Status of OHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameroon</td>
<td>18.1</td>
<td>1</td>
<td>0</td>
<td>1985: Yaounde</td>
<td>French Assistance</td>
<td>Inactive since 1994</td>
</tr>
<tr>
<td>Senegal</td>
<td>12.5</td>
<td>3</td>
<td>3</td>
<td>1992: Dakar</td>
<td>M. Ndiaye</td>
<td>Active</td>
</tr>
<tr>
<td>Mauritania</td>
<td>3.18</td>
<td>None</td>
<td>None</td>
<td>2002: Nouakchott</td>
<td>A.T. Pezzella (USA)</td>
<td>Visiting Surgeons</td>
</tr>
</tbody>
</table>
First Open Heart Surgery, Abidjan: Adult 26 years Atrial Septal Defect
16. 3. 78

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NEW CENTERS
Sénégal
Ghana
Mauritanie

OTHER CENTERS
Afrique du sud
Côte d’Ivoire
Egypte
Kenya
Maroc
Nigeria
Soudan
Tanzanie
Tunisie

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OPEN HEART SURGERY IN WEST AFRICA

Bouake University Hospital
Institute of Cardiology Abidjan
For countries in the early stages of development, rheumatic heart disease is the most common form of CVD. Indeed, it is thought to affect more than 4 million people worldwide, resulting in approximately 90,000 deaths each year (Michaud et al., 1993). A range of 20–35 percent of cardiac patients admitted to hospitals in Africa and Asia have rheumatic heart disease, often with heart failure or needing replacement of the heart valve. For the next 20–40 years, it is likely that developing countries will experience a double burden of CVD: rheumatic heart disease will continue, while atherosclerotic CVD becomes more common.
CARDIAC LESIONS AND SURGERY IN WEST AFRICA

- ACQUIRED VALVULAR HEART DISEASES
  (Rheumatic Fever ++++)

- CONGENITAL HEART DISEASES.

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<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<tbody>
<tr>
<td>Hypertension artérielle</td>
<td>38.5</td>
<td>38.6</td>
<td>9.3</td>
<td>58</td>
<td>36.5</td>
<td>49.1</td>
<td>39.3</td>
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<tr>
<td>Valvulopathies rhumatismales</td>
<td>25.6</td>
<td>13.9</td>
<td>14.2</td>
<td>13.8</td>
<td>22.9</td>
<td>13</td>
<td>14.5</td>
</tr>
<tr>
<td>Myocardiopathies Fibrose endom. ou endocardite pariétale chronique</td>
<td>13.8</td>
<td>17.8</td>
<td>9.8</td>
<td>14.7</td>
<td>15.9</td>
<td>16.1</td>
<td>6.3</td>
</tr>
<tr>
<td>Myocardiopathies du post-partum</td>
<td>8.7</td>
<td>1.3</td>
<td>2.2</td>
<td>2</td>
<td>1.8</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Maladie coronaire</td>
<td>0.9</td>
<td>1.5</td>
<td>0.9</td>
<td>3.1</td>
<td>2.2</td>
<td>1.8</td>
<td>6.5</td>
</tr>
<tr>
<td>Cardiopathies congénitales</td>
<td>0.3</td>
<td>4</td>
<td>18.4</td>
<td>4</td>
<td>0.8</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>Péricardites Insuffisances cardiaques</td>
<td>5.8</td>
<td>2.6</td>
<td>6.1</td>
<td>9</td>
<td>2.5</td>
<td>3.5</td>
<td>8.8</td>
</tr>
<tr>
<td>Cœur pulmonaire chronique</td>
<td>4.8</td>
<td>0.9</td>
<td>1.2</td>
<td>4</td>
<td>1.1</td>
<td>2.3</td>
<td>3</td>
</tr>
<tr>
<td>Endocardites infectieuses</td>
<td>0.9</td>
<td>1.2</td>
<td>6.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nombre de malades</td>
<td>312</td>
<td>1959</td>
<td>406</td>
<td>224</td>
<td>356</td>
<td>399</td>
<td>1960</td>
</tr>
</tbody>
</table>

(1) Sans échographie, sans cathétérisme ni angiographie.
(2) Avec échographie, sans angiographie.
(3) Avec échographie, cathétérisme et angiographie.
(4) Données obtenues à partir des seules explorations échographiques.
OPEN HEART SURGERY IN COTE D`IVOIRE
A TWENTY-TWO YEAR EXPERIENCE (1978-2000)

Bouake University Teaching Hospital
Institut de Cardiologie d`Abidjan

UNTH Radiology Enugu 2004
OPEN HEART SURGERY IN COTE D`IVOIRE : 1978-2000

N = 1665

- ACQUIRED VALVULAR HEART DISEASE  N = 994
- CONGENITAL HEART DISEASE    N = 408
- OTHERS                N = 263

UNTH Radiology Enugu 2004
ACQUIRED VALVULAR HEART DISEASES

OPEN-HEART SURGERY IN COTE D'IVOIRE
AT WENTY YEAR SURGICAL EXPERIENCE

YANGNI-ANGATE H¹., and al.

¹Department of Cardiovascular and Thoracic Surgery, CHU Bouake and Institut de Cardiologie of Abidjan

Summary

The aim of this study is to report our surgical experience with open heart surgery in Cote d'Ivoire. From 1978 to 2000, 1665 patients have been operated on by cardiopulmonary bypass (CPB). There were 994 for acquired valvular heart diseases, 408 for congenital heart diseases and 263 for others cardiac diseases. Concerning valvular cardiac surgery (n = 994), 776 were monovalvular (mitral n = 606, aortic n = 126, tricuspid n = 44), 215 were bivalvular (mitro-aortic n = 44, mitro-tricuspid n = 100) and 3 trivalvular. The mean age was 26 years (4 - 69 years) and 52 % of patients were in bad hemodynamic conditions (NYHA class III or IV). Rheumatic heart disease was the main etiology (n = 795, 80 %). 936 valve replacement have been done (Bioprosthesis n = 470, Mechanical Prosthesis n = 466) versus 280 valvular repair. Hospital and late mortality after CPB were respectively 8.5 % and 11.3 %. Among valvular heart diseases, were 80 cases of Endomyocardial Fibrosis (right side form 23, left side form 17, bilateral form 40). Mean age was 10 ± 6 years (2-15 years). Surgical procedures were endocardectomy plus valvular reconstruction (n = 26) or valvular replacement (n = 54). The overall operative mortality was 12.5 % (n = 10). Concerning congenital heart diseases (n = 408), the most frequent lesions were ventricular septal defect (VSD) 100, atrial septal defect (ASD) 140, tetralogy of Fallot 100, partial atrioventricular canal 16. The corrective repair has been done in all cases. The overall mortality was 10 % (n = 43).
## VALVE SURGERY PROCEDURES

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Replacement CI</th>
<th>Replacement SENEGAL</th>
<th>Replacement GHANA</th>
<th>Repair CI</th>
<th>Repair SENEGAL</th>
<th>Repair GHANA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitral Valve</td>
<td>658</td>
<td>55</td>
<td>-</td>
<td>166</td>
<td>43</td>
<td>-</td>
</tr>
<tr>
<td>Aortic Valve</td>
<td>230</td>
<td>23</td>
<td>-</td>
<td>14</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Tricuspid Valve</td>
<td>48</td>
<td>-</td>
<td>5</td>
<td>100</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>936</strong></td>
<td><strong>78</strong></td>
<td><strong>5</strong></td>
<td><strong>280</strong></td>
<td><strong>52</strong></td>
<td><strong>36</strong></td>
</tr>
</tbody>
</table>

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## VALVE REPLACEMENT DEVICES

<table>
<thead>
<tr>
<th></th>
<th>CI</th>
<th>SENEGAL</th>
<th>GHANA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOPROSTHESIS</strong></td>
<td>470</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><strong>MECHANICAL PROSTHESIS</strong></td>
<td>466</td>
<td>78</td>
<td>199</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>936</td>
<td>78</td>
<td>201</td>
</tr>
</tbody>
</table>
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### ACQUIRED VASCULAR HEART DISEASES

**SURGICAL RESULTS**

<table>
<thead>
<tr>
<th>Location</th>
<th>Hospital Mortality</th>
<th>Late Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI</td>
<td>8.5 %</td>
<td>7.37 %</td>
</tr>
<tr>
<td>N = 994</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SENEGAL</td>
<td>11.5 %</td>
<td>16.4 %</td>
</tr>
<tr>
<td>N = 122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHANA</td>
<td>9.9 %</td>
<td>7.7 %</td>
</tr>
<tr>
<td>N = 172</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Open heart surgery in Nigeria; a work in progress

Bode Falase¹*, Michael Sanusi¹†, Adetinuwe Majekodunmi²†, Barakat Animasahun³†,Ifeoluwa Ajose²†, Ariyo Idowu¹† and Adewale Oke⁴†

* Corresponding author: Bode Falase bodafalase@gmail.com

** Results

51 Open Heart Surgery procedures were done between August 2004 and December 2011. There were 21 males and 30 females. Mean age was 29 ± 15.6 years. The mean euroscore was 3.8 ± 2.1. The procedures done were Mitral Valve Replacement in 15 patients (29.4%), Atrial Septal Defect Repair in 14 patients (27.5%), Ventricular Septal Defect Repair in 8 patients (15.7%), Aortic Valve Replacement in 5 patients (9.8%), excision of Left Atrial Myxoma in 2 patients (3.9%), Coronary Artery Bypass Grafting in 2 patients (3.9%), Bidirectional Glenn Shunts in 2 patients (3.9%), Tetralogy of Fallot repair in 2 patients (3.9%) and Mitral Valve Repair in 1 patient (2%). There were 9 mortalities (17.6%) in this series. Challenges encountered included the low volume of cases done, an unstable working environment, limited number of trained staff, difficulty in obtaining laboratory support, limited financial support and difficulty in moving away from the Cardiac Mission Model.
## Répartition des décès suivant l'équipe chirurgicale et le type d'intervention

<table>
<thead>
<tr>
<th>INTERVENTIONS</th>
<th>Marseille (N=45)</th>
<th>Lyon (N=38)</th>
<th>Total (N=83)</th>
<th>% décès*</th>
</tr>
</thead>
<tbody>
<tr>
<td>RVM (N=35)</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>20%</td>
</tr>
<tr>
<td>RVM+PT/RVT (N=15)</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>33%</td>
</tr>
<tr>
<td>RVM+RVA (N=10)</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>RVM+RVA+PT/RVT (N=3)</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>66%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>12</strong></td>
<td><strong>7</strong></td>
<td><strong>19</strong></td>
<td></td>
</tr>
<tr>
<td>% décès</td>
<td><strong>14,2%</strong></td>
<td><strong>8,2%</strong></td>
<td><strong>22,8%</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Pourcentage par rapport au nombre d'interventions de même type*

- **RVM** : remplacement valvulaire mitral,
- **RVA** : remplacement valvulaire aortique,
- **PT** : plastie tricuspidienne,
- **RVT** : remplacement valvulaire tricuspidien.
MORBIDITY : CI
N = 994

Bioprosthesi s Degeneration       4.24 years - 6.5 years
Low Cardiac Output
Prosthetic Valve Endocarditis
ACQUIRED VALVULAR HEART DISEASES

TIME RELATED SURVIVAL

At 6 years

Mitral valve replacement : 70.14% +- 12.1

Aortic valve replacement : 63.05% +- 21.29

Mitro-Aortic valve replacement : 75.40% +- 32.38

Tricuspid valve replacement : 72% +- 23.7

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ENDOMYOCARDIAL FIBROSIS

Mean Age 10+- 0.6 (2-15 years)

80 cases
(1978 – 2000)

Boys  52  (65%)

Girls  28  (35%)

Right - Sided form  23

Left – Sided form  17

Bilateral form  40

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**EPC bilatérale prédominant à droite.** Radiographie sans préparation : large rebord de l'oreillette droite, infundibulum dilaté (sur le bord gauche), poumons clairs.

**EPC droite.** Angiocardiographie : amputation du ventricule, dilatation de l'infundibulum, irrégularités des contours, rosse oreillette droite.

**EPC droite.** Echographie 2D : échos intracavitaires (signe direct).

**EPC gauche.** Angiocardiographie : aspect en chapeau de champagne. Insuffisance mitrale.
SURGICAL RESULTS

80 cases: 1978 - 2000

Operative Death

<table>
<thead>
<tr>
<th>Form</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left side form</td>
<td>2</td>
<td>12%</td>
</tr>
<tr>
<td>Right side form</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bilateral form</td>
<td>8</td>
<td>20%</td>
</tr>
</tbody>
</table>

Total: 10 (12.5%)

ENDOMYOCARDIAL FIBROSIS

UNTH Radiology Enugu 2004
ACQUIRED VALVULAR HEART DISEASES

OPEN-HEART SURGERY IN COTE D'IVOIRE
A TWENTY YEAR SURGICAL EXPERIENCE

YANGNI-ANGATE H¹., and al.

¹Department of Cardiovascular and Thoracic Surgery, CHU Bouake
and Institut de Cardiologie d’Abidjan

CONGENITAL HEART DISEASES

N = 408 (1978 – 2000)

VSD 100
ASD 140
T4 FALLOT 100
Partial A-V Canal 16
Pulmonary Stenosis 14

TOTAL 370 (91%)

Complete A-V Canal 6
Ducto Dependant Cardiac Diseases 26
Other Complex Diseases 6

TOTAL 38 (9%)

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<table>
<thead>
<tr>
<th></th>
<th>USA (see ref. 10) N = 103,590 live-births with follow-up</th>
<th>CAMEROON N = 33,198 hospital-based Actual study n = 211</th>
<th>CÔTE-D’IVOIRE (Adapted from ref. 4 in text)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hemodynamic series (1986) - n = 612</td>
<td>Clinical series (1977) - n = 259</td>
</tr>
<tr>
<td>VSD (28.3)</td>
<td>VSD (45)</td>
<td>VSD (25.8)</td>
<td>VSD (38)</td>
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<tr>
<td>PS (9.5)</td>
<td>TOF (22)</td>
<td>PDA (17.8)</td>
<td>ASD (13.8)</td>
</tr>
<tr>
<td>PDA (8.7)</td>
<td>TGA (7.6)</td>
<td>ASD (15.0)</td>
<td>TOF (8.8)</td>
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<tr>
<td>YSD + PS or TDF (6.8)</td>
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<td>AS (5.2)</td>
<td>TOF (14.8)</td>
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<tr>
<td>ASD-secundum (6.7)</td>
<td></td>
<td>PS (5.2)</td>
<td>PDA (7.7)</td>
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<tr>
<td>AS (4.4)</td>
<td>PS (4.3)</td>
<td>A-V Canal (3.5)</td>
<td>A-V Canal (7.7)</td>
</tr>
<tr>
<td>CA (4.2)</td>
<td>AS (1.9)</td>
<td>DORV (2.5)</td>
<td>TGA (3.8)</td>
</tr>
<tr>
<td>A-V Canal (3.5)</td>
<td>A-V Canal (1.9)</td>
<td>PA + VSD (2)</td>
<td>CA (2.3)</td>
</tr>
<tr>
<td>TGA (3.4)</td>
<td>CA (1.4)</td>
<td>SV (1.8)</td>
<td>TA (1.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CA (1.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AS (1.5)</td>
</tr>
</tbody>
</table>
Summary

The aim of this study is to report our surgical experience with open heart surgery in Cote d'Ivoire. From 1978 to 2000, 1665 patients have been operated on by cardiopulmonary by pass (CPB). There were 994 for acquired valvular heart diseases, 408 for congenital heart diseases and 263 for others cardiac diseases. Concerning valvular cardiac surgery (n = 994), 776 were monovalvular (mitral n = 606, aortic n = 126, tricuspid n = 44), 215 were bivalvular (mitro-aortic n = 44, mitro-tricuspid n = 100) and 3 trivalvular. The mean age was 26 years (4-69 years) and 52% of patients were in bad hemodynamic conditions (NYHA class III or IV). Rheumatic heart disease was the main etiology (n = 795, 80%). 936 valve replacement have been done (Bioprosthesis n = 470, Mechanical Prosthesis n = 466) versus 280 valvular repair. Hospital and late mortality after CPB were respectively 8.5% and 11.3%. Among valvular heart diseases, were 80 cases of Endomyocardial Fibrosis (right side form 23, left side form 17, bilateral form 40). Mean age was 10 ± 6 years (2-15 years). Surgical procedures were endocardectomy plus valvular reconstruction (n = 26) or valvular replacement (n = 54). The overall operative mortality was 12.5% (n = 10). Concerning congenital heart diseases (n = 408), the most frequent lesions were ventricular septal defect (VSD) 100, atrial septal defect (ASD) 140, tetralogy of Fallot 100, partial atrioventricular canal 16. The corrective repair has been done in all cases. The overall mortality was 10% (n = 43).
Cardiopathies congenitales opérees à dakar. 
A propos de 1 02 cas.

Surgery of congenital heart diseases in Dakar, from a series of 1 02 cases.

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3. Service de Cardiologie

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Introduction: la chirurgie des cardiopathies congenitales est recente dans notre pays. Nos indications chirurgicales sont assignees aux moyens existants, et seuls les patients opérés sont rapportées dans cette étude qui a pour but d'établir le profil clinique et les résultats de la prise en charge de ces malformations. Entre 1992 et 2002, 102 patients ont été opérés. Il y'avait 54 cas de persistance du canal arteriel (PCA), 27 cas de tetralogie de Fallot (IF), 17 cas de communication interatriale (CIA) et 4 cas de cardiopathies complexes. L'age moyen etait de 7,02 ans et le sex-ratio de 0,75. les patients avaient beneficie soit d'une chirurgie palliative soit d'un geste curatif. Les PCA avaient ete fermées par section suivie de suture dans 30 cas (55,56%) et par ligature dans 24 cas (44,44%). La chirurgie dans les TF etait palliative dans 26 cas (96,30%) et curative dans 1 cas (correction complete). Les CIA avaient toutes ete fermées sous circulation extracorporelle, soit par un patch dans 11 cas (64,70%), soit par suture directe (35,30%). Un geste palliatif avait ete realise pour les cardiopathies complexes. Resultats La mortalite hospitaliere etait de 1,80% pour les PCA, 5,80% pour les CIA de II, 30% pour les TF et de 50% pour les cardiopathies complexes. Le suivi moyen etait de 30 mois. La chirurgie des cardiopathies congenitales donne des resultats favorables lorsqu'elle est adaptee aux moyens humains et techniques. Une amelioration de ces moyens est cependant necessaire pour realiser la cure de toutes les malformations, de meme qu'une organisation pluridisciplinaire pour assurer un suivi post-chirurgical correct.
CHALLENGES

- Heart Surgery: not always a Priority

- A few Centres perform regular Open Heart Surgery
  (Côte d’Ivoire, Ghana, Senegal)

- Congenital Heart Diseases Screening remains insufficient

- No Health Insurance Scheme
Heart surgeons find their way in Senegal

When Mouhamadou Ndiaye began talking about open-heart surgery in Senegal in 1990, authorities told him it wasn't a priority.

"We don't have open-heart surgery problems," they said, according to Ndiaye, head of the thoracic and cardiovascular surgery department at Dakar's Fann university teaching hospital. "Our problems are malaria, diarrhoea, vomiting."

"My reply, invariably, was that all patients were patients and needed care," said Ndiaye, who received his training in Europe and returned to Senegal in 1989.

It took time, collaboration with several non-governmental organisations and especially a fortuitous encounter, in 1995, with an American surgeon before the first open-heart operation took place in Senegal, Ndiaye said.
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- No Health Insurance Scheme
In Sub-Saharan Africa and in developing countries, rheumatic cardiopathies represent 5 to 10% of deaths due to a cardiovascular sickness; they affect 12 to 40% of the African population and will remain frequent within the next 20 to 40 years\textsuperscript{13}. Furthermore, in Africa congenital cardiopathies screening remains insufficient. For example in Cote d'Ivoire, on looking at the incidence of congenital cardiopathies between 5 and 8 for 1000 births and the number of 360,000 births per year, between 1800 and 2800 congenital anomalies per year should be discovered\textsuperscript{14}. We are still far from this incidence here as well as in other African regions. For these reasons, it is necessary to increase in Africa the human resources in cardiology and to establish many centers for screening cardiovascular diseases. So, in Cote d'Ivoire, as a supplement to the Institut de Cardiologie of Abidjan in the south of the country, the construction of a second center of cardiology started in Bouake, a town located in the center of our country (figure 3).
Many of our Patients Cannot afford the Bill

- (GDP per capita = very low)

Cost of Cardiac Surgery:

Without Prosthesis = 4,800 USD

With Prosthesis = 5,600 USD

- Limited Capacity and Resources for Cardiology and Cardiac Surgery

- Contractors often supply us with outdated and non-functional Equipments
African experiences of humanitarian cardiovascular medicine: The Cardiac Centre of St. Elizabeth Catholic General Hospital, Shisong

- Sr. Appolonia Budzee\(^1\), JC Tantchou Tchoumi\(^2\), Alessandro Giamberti\(^3\), JC Ambassa\(^2\), Sylvia Cirri\(^3\), Gianfranco Butera\(^3\)

- **Poverty**

  In a developing country where the mean monthly income of our patients is 500\$, the surgical fees 4,000\$, even though five times less expensive than in European Countries, are still very expensive for the population. The death registered after diagnosis before surgery is 32.5\% while only 26.5\% of those diagnosed benefited from the surgery. Obviously the psychological condition of a poor patient, diagnosed with a disease that requires surgery is characterized by intense trauma. Part of the poverty as indicated above, consists of illiteracy and lack of information. It is not common for an average Cameroonian to freely undertake health screening while many consult a medical doctor as a last resort when the illness is far advanced.
RECOMMANDATIONS

International Cooperation
African Association of Thoracic and Cardio-Vascular Surgeons

WEB - SITE: http://www.aatcvs.org
ENUGU TEACHING HOSPITAL: TEAM OF CARDIAC SURGERY
The Ivorian Heart Foundation is the charity that leads the fight for heart health for all the populations living in Côte d’Ivoire. We aim to prevent people from heart and circulatory diseases; and we also aim to help those suffering from it by providing comfort and assistances; and through the research...
Save A Child’s Heart
Ibadan
PEDIATRIC AND CONGENITAL HEART DISEASES:
HEALTH PRIORITY OF THE 21ST CENTURY

I.C.H.F.
International Children’s Heart Fund

“You can make a difference”

To save a child is to save a world
CARDIOVASCULAR CENTRE IN AFRICA

ELIZABETH GATUMIA - KENYA
RECOMMENDATIONS

PROMOTION OF CLINICAL RESEARCH
WEB - SITE: http://www.aatcvs.org
RECOMMANDATIONS

- Regional Centres of Excellence to provide cost effective care of Patients needing Surgery

- More Centres for Cardiac Surgery In the Region.
NEW CENTRE: BOUAKE (IVORY-COAST)
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The Surgeon as Musician

Evarts Ambrose Graham was a pioneer not only in lung surgery, but also in X-ray studies of the gall bladder. He described the profession as follows:

“In many respects surgery is like music, which has its great artists and its great composers. The great musical artists are like the great surgeons. They often perform before large audiences with great technical skill, and they have large incomes. But what they accomplish is the work of the composers, the creative men who have made it possible for them to perform and who often have received only modest economic rewards. What our present surgeons need is more men of the composer type!”
Heartfelt Advice

Perhaps the greatest advances in diagnosis of acquired heart defects were made by James Hope (1801-41). He studied in Edinburgh and, after years of training in France, Switzerland and Italy, became chief of internal medicine at St. George’s Hospital in London—only to die of lung tuberculosis.

Hope’s book Diseases of the Heart and Great Vessels (1831) described symptoms of valvular heart disease. His observations became a guide to all heart doctors, and paved the way for surgical treatment. Influential, too, were his ethical principles:

“In the first place, never keep a patient sick when you can do something for him. In the second place, never take a higher fee than what you truly feel you are entitled to. In the third place, always pray for your patients.”
CONCLUSION

Surgery is too late: prevention of the ARF is very important.

Primary Prevention of Rheumatic Fever by treating sore throat

**Antibiotic Administration**

- **Benzathine benzyl penicillin**
  - Single IM injection
  - 1.2 MU > 30 kg
  - 600 000 U < 30 kg

- **Phenoxymethyl penicillin** (Pen VK)
  - PO for 10 days
  - 250 - 500 mg qds for 10 days
  - 125 mg qds X 10 if < 30 kg

- **Erythromycin ethylsuccinate**
  - PO for 10 days
  - Use same dose as above.

Secondary Prevention stops sore throat, prevents recurrences of ARF and aids in regression of RHD.