LETTERS TO THE EDITOR

Pioneer Human Open Heart Surgery using cardiopulmonary by pass in Uganda

Akomea-Agyin C, Galukande M, Mwambu T, Ttendo S, Clarke I

1 St. Anthony Hospital London, 2 International Hospital, Kampala (IHK), 3 Mulago Hospital Kampala

Abstract

Introduction: For the first time in Uganda in April 2007, two open-heart surgeries were done using cardiopulmonary by pass. A multidisciplinary team of largely indigenous Ugandans professionals working in Uganda formed the pioneering team.

Context: Access in cardiac surgery in the developing countries is very limited. The challenges that impede access to adequate and appropriate health care including open-heart surgery are in the least complex and daunting.

Patient selection: Two 13 and 17 year old males with Secundum Atrial Septal defects were chosen from a long waiting list. The criteria used included no or minimal co morbidity states, patient fitness and available ICU ventilation facilities.

Preparation: Took an eleven months period, including formulation and adoption of peri and intra operation protocols, training of staff, sourcing of usable and mobilizing the financing.

Outcomes: The procedure for the two patients was successfully performed. The immediate and short-term postoperative periods were uneventful. At the twelve months review point both patients were leading a normal life. In the months that followed 19 other open-heart procedures were done including two mitral valves replacements.

Conclusion: This program has greatly enhanced the level of care for the critically ill at this facility. Its sustenance and replication in other centres in the country is essential. Government and development partners’ support is critical. The educational value of this program ought to be exploited by health professions students in the country.

Introduction

For the first time in Uganda on the 13th April and 15th April 2007, a multidisciplinary team at International Hospital Kampala (IHK), Uganda carried out two Open-heart surgery operations using a cardiopulmonary by pass machine after an 11-month preparation period. Closure of Atrial Septal Defects (ASD) in a 13 year old and 17-year-old boys were done.

Cardiovascular disease is a growing threat to health in Africa accounting for 9.2% of deaths in 2001 among which is Rheumatic valve disease as a major contributor. Others include cardiomyopathy, stroke and hypertension.

The average number of cardiac surgical cases performed in North America, Australia and Europe is 860 cases per million population. This means that in an optimal environment where every patient who needs a heart operation can actually get one, there will be 860 cases performed for every million population. On the other hand, the average number of cardiac cases performed in South America, the Russian Federation, Asia and Africa is 60 cases per million population. This means that of all the people living outside North America, Europe and Australia who actually need an open-heart operation, 93% cannot get that operation. In absolute numbers, this translates to 4.5 billion people in the world having no access to cardiac surgery.

The challenges that impede access to adequate and appropriate health care including open-heart surgery are in the least complex and daunting. The health care budget in Uganda is less than USD $ 15 per person per year, life expectancy is less than 50 years. The burden of infectious diseases is high and such takes up most resources. The prevalence of HIV is 6.4% adults and 0.7% children making more than one million people infected out of a population of only 30 million.

Numerous surgical teams travel to underdeveloped countries to perform surgery each year and to train the local surgeons and ancillary personnel as best they can. However, in most such cases, the surgical teams are present at those sites for no more than one week per year, leaving the local populace and surgeons to struggle for themselves for the remainder of the year. The World Heart Foundation proposes that rather than continuing with the current disorganized and inefficient system, the problem should be addressed by multi-dimensional approach directed at both an improvement in surgical services and an enhancement...
of education and training, taking maximum advantage of contemporary communications technology and educational techniques but this proposal meets steep organizational and logistical challenges.

Preparation
Despite the complex challenges posed, there is hope for improvement of health care in Africa. Its in that spirit that the pioneering team took to a eleven month preparatory period to make this feat possible in one of the world’s poorest countries.

A Paediatric cardiologist and a cardio-thoracic surgeon (both Ugandan) did the patient screening. The strategy was to start with Atrial Septal Defect without or with minimal co-morbidities. Selection was based on patient fitness, available ICU facilities for ventilation, theatre consumables like cardiac cannulae and the heart pulmonary by pass machine tubings. It was critical that the first try-ever ends successfully with satisfactory long-term outcomes, therefore the choice of Atrial Septal Defect closure. Routine infection control measures were in place too. The post operative records indicated a 0.2% annual post operation infection rates for all general surgical cases at the facility in which these pioneer surgeries were done.

The laboratory services available included basic haematological, biochemical tests including Arterial blood glasses, activated clotting time (with a turn around time of less than 3-5 minutes). A 24/7 blood bank service was available.

In the six bed ICU facility, two beds and ventilators were dedicated to these patients. Invasive monitoring was employed.

The team included two cardiac surgeons, a general surgeon, an Intensivist, and several anaesthesiologists with support teams for nursing, physiotherapy, and laboratory pharmacy and biomedical technical departments. In the numerous preparatory meetings, intra-operative procedure and postoperative protocols were formulated and later referred to.

Outcomes
Pre cutting time preparations took 4 hours for the first patient and 2 hours for the second. Operating time was 4 hours for the first operation and two and half for the second patient. Extubation in ICU for both patients happened between 4-5 hours after the operation. Discharge from intensive care unit was 48 hours later with chest tubes and pacing wires removed and incision site exposed.

All parameters Arterial Blood Gases, X-ray, Echocardiogram, Full blood count; Urea and electrolytes, all vital signs BP were satisfactory before both patients were discharged from ICU and later from the hospital on day 9 and 11. Subsequent reviews were done on an out patient basis, initially at four-week intervals. Since then the program has carried on with nineteen other operations including two prosthetic valvular replacements.

Conclusion
This program has been a catalytic in up scaling the level of care for the critically ill at International Hospital Kampala.

We hope that the ripple on effect will impact on the national strategies of improving specialist Health Care Service delivery in Uganda. Recruiting government and development partners’ support is essential for the sustenance of this program at this centre. The educational value of this program should be exploited by teaching institutions.

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