CARDIAC SURGERY IN GENERAL HOSPITAL, KUALA LUMPUR : REVIEW OF ALL OPEN-HEART OPERATIONS APRIL 1982 TO FEBRUARY 1987

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INTRODUCTION

The Cardiothoracic Department, General Hospital, Kuala Lumpur which was set up in April 1982, deals with a wide range of cardiac disease, general thoracic and also vascular cases. A total of 2,450 operations were performed from April 1982 to February 1987, and 79.3% of these were for cardiac cases (open and closed heart). This paper reports a review of the 1,110 consecutive open heart operations performed by the Department during the stated period.

PATIENTS AND METHODS

The patients undergoing open heart surgery varied in age from 1 month to 69 years. 765 patients were below 30 years of age (Table I) and 223 were from East Malaysia (Table II).

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TABLE I
AGE OF PATIENTS UNDERGOING OPEN HEART SURGERY

Age (yrs.)	Patients
0 – 15	346
16 – 30	419
31 – 60	336
> 60	9

TABLE II
ORIGIN OF PATIENTS UNDERGOING OPEN HEART SURGERY

Patient Origin	Patients (no.)
West Malaysia	875
East Malaysia	233
Others	2 (from Indonesia and Burma)

When the Cardiac Intensive Care Unit (CICU) began, all patients with congenital heart disease, rheumatic valvular disease and coronary artery disease had invasive cardiac catheterisation prior to surgery. However since early 1986, those with atrial septal defects and those with valvular lesions

were accepted for surgery without undergoing this procedure if their diagnosis were clear on clinical and non-invasive studies alone.

Conventional hypothermic cardiopulmonary bypass using bubble oxygenator was used routinely. Fifteen patients weighing less than 7 kg underwent correction of congenital defect under profound hypothermia with circulatory arrest. Throughout the series, an average of about 3 units of blood per person was used for both adults and children.

Post-operatively, all patients were nursed in the CICU. Their progress were routinely monitored by right and sometimes left atrial pressure measurements, arterial pressure, urine output, blood drainage and ECG. Serial blood gases, serum electrolyte estimations and portable chest X-ray also formed an essential part of the postoperative management. The average stay in CICU was 48 hours. The average stay in hospital after surgery was 14 days.

RESULTS

Table III shows the breakdown of the number of open heart surgery performed on a yearly basis. 536 operations were for acquired and 574 for congenital heart disease (Table IV).

TABLE III
OPEN HEART SURGERY PERFORMED BETWEEN 1982 – 1987

Year	1982 (April)	1983	1984	1985	1986	1987 (Upto February)	Total
Operations	127	181	252	217	282	51	1,110

TABLE IV
TYPE OF OPERATIONS PERFORMED

	Patient number of Deaths		Hospital mortality (%)
Acquired Disease:			
Valve replacement (Plus combined procedures)	303	(9)	3.0
Open mitral valvotomy	100	(1)	1.0
Coronary artery bypass grafts	118	(0)	0
Miscellaneous	15	(1)	6.7
Congenital heart disease	574	(17)	3.0
Total	1110	(28)	2.5

Acquired Heart Disease

Valve Replacement. Valve surgery formed the largest single group. A total of 303 patients underwent valve replacement and the total hospital mortality for this group was 3.0% (Table V). 19 patients in addition had simultaneous procedures performed and three died (Table VI).

TABLE V
TYPES OF VALVE REPLACEMENT

Valve Replacement	Patients (No.)	(Death)	Hospital mortality (%)
Mitral	207	(6)	2.9
Aortic	51	(1)	2.0
Mitral and Aortic (Double)	44	(2)	4.5
Tricuspid	1	(0)	0

TABLE VI
COMBINED PROCEDURES

	Patients	Deaths
Aortic Valve and		
Coronary Artery Surgery	1	–
Mitral Valve Repair	2	–
Ascending Aortic Replacement	2	1
Mitral Valve and		
Coronary Artery Surgery	2	1
Tricuspid Annuloplasty	12	1

Five patients underwent emergency valve replacement of which three had bacterial endocarditis (two native aortic valve and one prosthetic endocarditis in the mitral position). One patient had a perivalvular leak in the aortic position six months after valve replacement and the other patient had a failure (cusp rupture) of a bioprosthesis in the mitral position. The single death in the aortic group was a patient who had a simultaneous ascending aortic replacement for acute dissection. She had features of Marfan's Syndrome.

Mitral Vavoltomy. One hundred patients underwent mitral valvotomy. Open valvotomy is routinely performed for mitral stenosis with mobile leaflets in our department. Three of the patients were in the second trimester of pregnancy and following surgery all completed the pregnancy

uneventfully and had normal deliveries. The one death in this group was due to cerebral infarction secondary to embolism. She was in atrial fibrillation and had large amounts of clot in the left atrium.

Coronary Artery Surgery. This bypass was performed in 118 patients and there were no deaths in this group (Table VII).

TABLE VII
CORONARY ARTERY SURGERY PERFORMED AT GENERAL HOSPITAL, KUALA LUMPUR (1982 – 1987)

118 patients	112 males, 6 females
Number of grafts/patients	0% Mortality
	No. of patients
1 – 2	14
3 – 4	80
5 – 6	23
> > 7	1

The age range was between 30–67 years. The youngest patient was a 30-year-old Chinese female who had hyperlipidaemia. Interestingly, 53 patients had previous myocardinal infarction. Seventy had hyperlipidaemia and 76 were chronic smokers prior to surgery. Thirty patients had left main stem disease and 68 patients had triple vessel disease.

Miscellaneous. The 15 miscellaneous operations in the acquired group included the removal of six atrial myxomas and one ventricular sarcoma. There were three cases of ruptured sinus of valvalsa presenting in the space of four months. One patient had a resection of a left ventricular aneurysm. The single mortality in this group was an elderly lady who had a left atrial myxoma with severe pulmonary hypertension. She died of right ventricular failure on the night of surgery.

Congenital Heart Disease

Table VIII shows the breakdown of the operations for congenital heart disease. The four most common diagnoses were atrial septal defect, ventricular septal defect, Fallot's Tetralogy and pulmonary stenosis. The overall hospital mortality for this group was 3.0%. The two patients that died in the ASD group had severe systemic pulmonary hypertension with minimal left to right shunt; one died of right heart failure and the other of respiratory failure in the early postoperative period. Similarly, the seven deaths in the VSD group had severe pulmonary vascular disease: three of them were less than 7 kg and had undergone surgery under profound hypothemia and circulatory arrest.

TABLE VIII
TYPE OF OPERATIONS FOR CONGENITAL HEART DISEASES

Operations	Patients (no.)	Deaths (no.)
Closure of ASD (includes Sinus venousus and ostium primum)	329	2
Closure of ASD	158	7
Total correction of Tetralogy of Fallot	56	7
Open Pulmonary Valvotomy	16	0
Infundibular Resection	5	0
Miscellaneous	10	1

In the miscellaneous group, three patients underwent transpulmomary closure of persistent ductus arteriosus for persistent shunt following PDA ligation (Table IX). The single death was a month-old infant who underwent surgery for pulmonary atresia.

TABLE IX
MISCELLANEOUS CONGENITAL GROUP

Operations	Patients (no.)	Deaths in hospital (no.)
Closure of PDA under Cardiopulmonary Bypass	3	–
Mustard's Operation for Transposition of Great Arteries	2	–
Repair of Hemitruncus	2	–
Complete A. V. Canal	1	–
Cortriatrium	1	–
Pulmonary Atresia	1	1

DISCUSSION

In this review, we have recorded the performance of a new department in its initial five years of service. The paper also gives an insight into the spectrum of surgically-treatable heart disease

that is found in our population. The total overall hospital mortality of 2.5% compares favourably with other centres.

Valvular Heart Disease

Rheumatic heart disease is a major problem in our population. It accounts for almost all the valvular heart lesions in our series. Most of our patients (more than 80%) were below the age of 30 years and more than 75% were in functional class III to IV with cardiomegaly and impaired ventricular function. Our early evaluation of the results of valve replacement in terms of symptomatic relief has been most encouraging and we await to see the long-term results.

For acute infective endocarditis, our initial results have shown the obvious benefits of emergency valve replacement. Unremitting fever and/or cardiac failure are rapidly controlled following surgery. It is our policy now to treat this serious condition aggressively with early surgery when medical therapy fails.[1-3]

For mitral stenosis with mobile leaflets, we regard valvotomy by the open method under cardiopulmonary bypass as the surgical treatment of choice. It permits direct visualization of the mitral valve and precise incision of the fused commissures and, if necessary, the subvalvular structures. Left atrial and leaflet thrombi can also be safely removed. In addition, the functional result may be assessed at the time of surgery. The long-term results by this method have been shown to be better than closed valvotomy.[4]

Coronary Artery Surgery

In our population, coronary artery disease is a major cause of morbidity and mortality, and surgery can contribute to the reduction of both. In our series, angina pectoris significantly interfering with the patient's lifestyle has been the most common indication for surgery. Other indications for surgery in our series are unstable angina and prophylactically for patients for left main or triple vessel coronary artery disease.

With increasing awareness of the availability of the operation locally, we believe we have to be prepared for a steady and substantial increase in the volume of surgery for coronary artery disease and our results have shown that this can be achieved with low operative risk.

Congenital Heart Disease

In this review, 52% of the operations were for congenital heart disease and the hospital mortality for this group was 3.0%. The results of surgery depends on the age of the patient and timing of the surgery. In our experience, most of our cases with acyanotic heart disease present late with evidence of pulmonary vasuclar disease. However, surgery is usually not contraindicated unless there is clear evidence of shunt reversal. For the cyanotic heart disease, it is our policy to undertake total correction if the anatomy is suitable. For the more complex heart disease and in infants with Fallot's Tetralogy, we usually palliate them with the modified Blalock-Taussig systemic-pulmonary shunt.

CONCLUSION

This paper reviews the overall experience of a Department dealing with a wide range of cardiac diseases. This study was not designed to show long-term results but we hope the obvious early benefits in terms of symptomatic relief and return to useful and productive life would be sustained in most patients as time goes on.

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