

# CARDIAC SURGERY IN MALTA: PAST, PRESENT AND FUTURE

## ABSTRACT

In 1918 neurosurgeon Sir Charles Ballance removed a bullet from the heart of a soldier based in Malta. After WWII cardiac surgeon Mr Lance Bromley and cardiologist Dr Edwin Besterman treated Maltese patients in St Mary's Hospital, London. A visiting consultant service in 1983 was followed by a permanent resident program in 1995, providing a comprehensive adult cardiothoracic service. The future of cardiac surgery depends on evolving technologies and surgeons who are innovators.

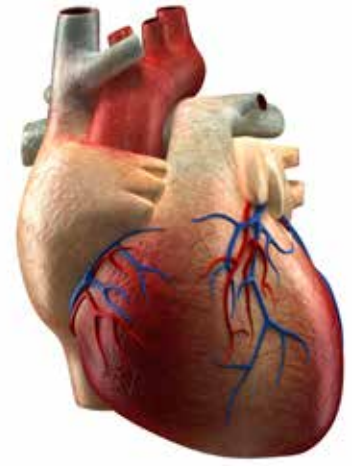
Cardiac surgery was inaugurated in Malta on the 16<sup>th</sup> February 1918 when Sir Charles Ballance, a renowned neurosurgeon and a colonel in the British Expeditionary Forces in Malta, removed a bullet from the heart of 21-year old trooper Robert Hugh Martin.<sup>1</sup> Dr Sarah Marguerite White assisted Ballance and Lt Colonel Shirley administered the anaesthetic. The heart was exposed via a Kochers incision with removal of the left 4<sup>th</sup> to 6<sup>th</sup> costal cartilages. Charles Ballance cut into the right ventricle and retrieved the bullet with an artery forceps from the inferior interventricular septum adjacent to the apex of the heart. Significant haemorrhage was stemmed with internal Lembert sutures and a blood transfusion was also administered.<sup>2</sup> This was the third such attempt worldwide but the patient died of sepsis one month post-operatively and the operation never achieved its

due recognition. Ballance observed “it is a common experience that bullets frequently lodge in the tissue and induce neither local nor general infection until attempts at removal are made”. Ballance recorded his experience in the prestigious Bradshaw lecture, entitled *The Surgery of the Heart*, which he delivered the following year.<sup>3</sup>

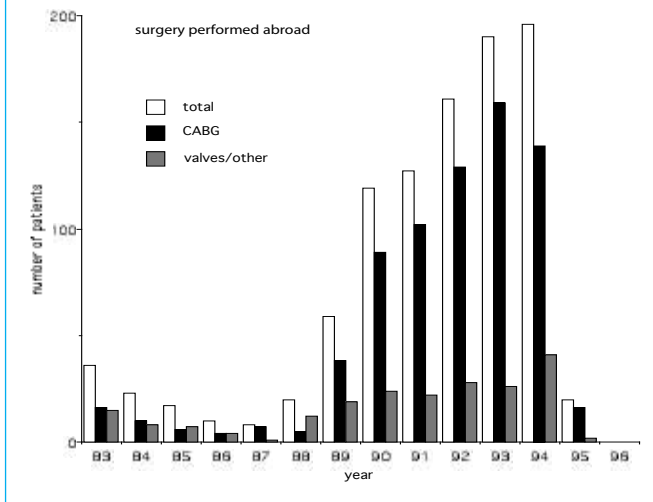
The next milestone came in 1947 when Professor Peter Paul Debono operated on 8-year old Iris Magro of Naxxar and successfully ligated her patent ductus arteriosus. The operation was performed on the 27<sup>th</sup> September at the Bugeja Hospital, Hamrun; the first assistant was Dr Victor Griffiths and the anaesthetist Dr Joseph Darmanin Demajo. The patient was referred by Peter Paul's brother, Professor Josie Debono and by Dr Victor Captur. She complained of weakness and lethargy and had a fever of up to 102°F. Examination revealed a machinery murmur in the pulmonary area and blood cultures were repeatedly positive for *Streptococcus viridans*. A presumptive

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**Figure 1:** Maltese patients undergoing cardiac surgery in the UK 1983-1996. CABG: Coronary Artery Bypass Graft



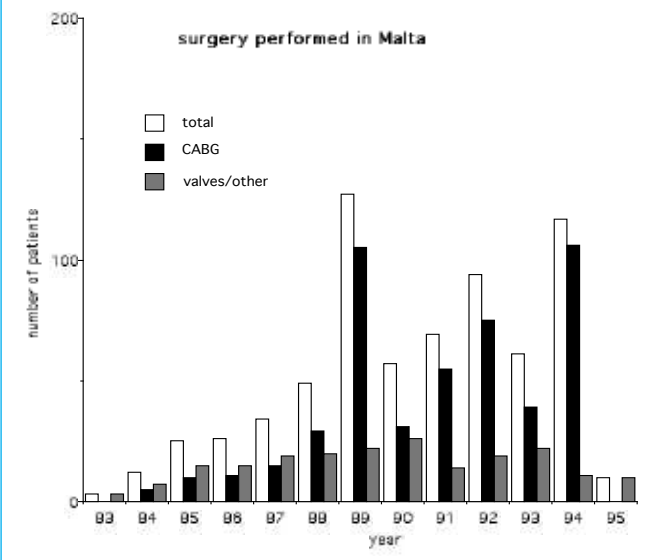
surgery. Visiting consultants from London came to Malta on a regular basis to see patients and advise on treatment. Some of these patients would then be sent to St Mary's Hospital London for further investigation and, in some cases, surgical treatment. Foremost amongst these visitors were cardiac surgeon Mr Lance Bromley and cardiologist Dr Edwin Besterman. Bromley and Besterman reported on their 14-year experience in Malta, performing closed mitral valvotomy at a mean annual rate of 4/100,000 population.<sup>5</sup> Their standard technique, developed at St Mary's Hospital London, involved commissurotomy using a Tubbs dilator. This London series, comprising over 500 patients over a 24-year period yielded excellent clinical results with 94% of patients enjoying full functional capacity, and less than 4% requiring reoperation at 10-year follow-up.<sup>6</sup>

diagnosis of infective endarteritis of the patent ductus warranted urgent surgery. At operation the left chest was entered via the second interspace, with division of two adjacent ribs. The  $\frac{3}{4}$  inch ductus was identified and a silk ligature was passed over an aneurysm needle. The ductus was tied on its aortic side using a Ballance knot.<sup>4</sup>

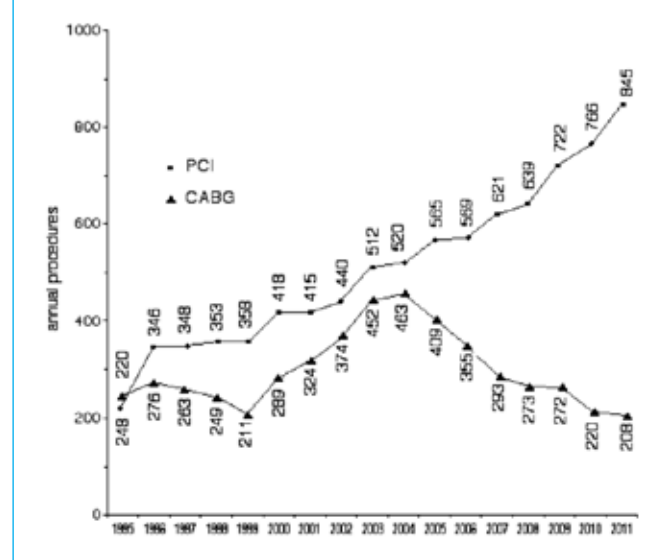
The post-war years saw a consolidation of the links with the United Kingdom in the field of cardiology and cardiac

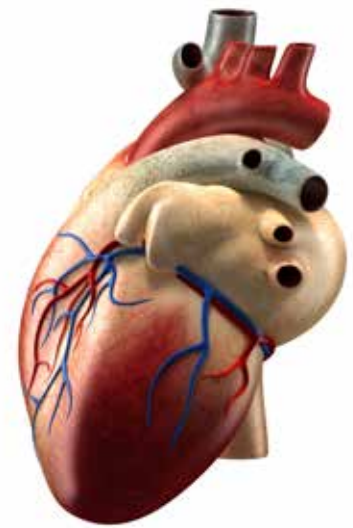
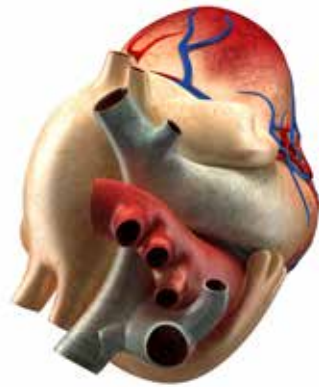
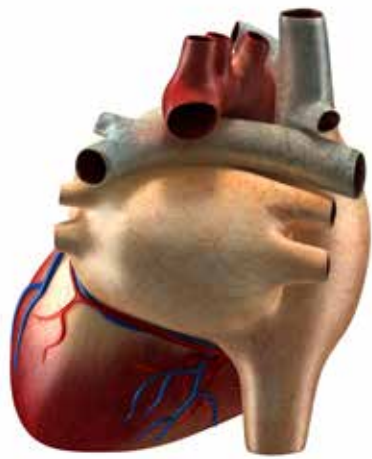
In 1983 Mr Alan Yates performed the first heart operation in Malta and inaugurated a visiting service here. Over the years Maltese patients benefited from the services of UK teams who performed surgery both in the UK (figure 1) and

**Figure 2:** Maltese patients undergoing cardiac surgery in Malta 1983-1995. CABG: Coronary Artery Bypass Graft



**Figure 3:** Trends in CABG and PCI 1995-2011





**Table 1:** Comparison of evolving nature of cardiology services in Malta

Variables	1995	2000	2015
Mean age	60.7		64.9
Mean waiting time (weeks)	38		2
Parsonnet risk	7.6		11.6
EuroSCORE risk*		2.7	4.3
Coronary Artery Bypass Grafting	82.7%		44.2%
Aortic Valve Replacement	10.0%		37.2%
Mitral repair	0*		63.2%*
Miscellaneous procedures	1.3%		7.0%
Mean post-op length of stay (days)	6.46		7.51
Post-op Atrial Fibrillation	7.0%		36.4%

\* EuroSCORE was calculated from 2000 onwards; \*denotes % of mitral procedures

in Malta (figure 2). Yates was joined by Mr David Anderson, also from Guy's Hospital. Other teams participating in this program were headed by Mr Rex Stanbridge from St Mary's Hospital, Mr Fik Shabbo and Mr John O'Riordan from the Brook Hospital, Mr Alan Wood from the Royal London Hospital, as well as Mr Brian Fabri from Liverpool. The early 1990's ushered in an expansion in terms of numbers and this provided a catalyst for setting up a permanent local cardiothoracic unit.

The author visited Malta in January 1995 and performed a trial series of 10 patients. Following his appointment as consultant cardiothoracic surgeon, and anticipating the arrival of cardiologist Professor Albert Fenech from the UK, the permanent local program was planned to commence in April 1995. In preparation for a smooth start in Malta, local theatre, intensive care and ward nurses were flown to the Northern General Hospital, Sheffield for clinical training. Major equipment that was purchased around this time included a heart-lung machine with heater/cooler unit, a blood gas analyser, theatre and transfer monitors, a servo ventilator, an intra-aortic balloon pump, syringe drivers, surgical instruments, as well as pump sets, oxygenators and heart valves. Based on the intervention rates in 1993 and 1994, both with regard to angioplasty and surgical operations, and

taking into account the size of the Maltese population and the waiting list as it stood in January 1995, it was projected that approximately 350 operations would have to be performed annually in order to provide an effective service.

The early years of the service saw a steady expansion in operative throughput and a consequent fall in waiting times. Theatre time increased from 6 to 11 half-day sessions per week, with 8 of these sessions out of hours. A transplant program was also inaugurated in 1996.<sup>7</sup> Cancellations, due to ITU staff and bed shortages were finally addressed with the opening of a dedicated CICU in 2000. Around this time two further consultants were appointed and annual operations increased from 300 in 1995 to peak at 537 in 2004. The surgical program was consolidated but was later challenged by a relentless expansion in interventional cardiology (figure 3).<sup>8</sup> This has been largely addressed with the setting up of a multidisciplinary Heart Team 2 years ago.

With the steady encroachment of interventional cardiology into the traditional cardiac surgical domain, the size and nature of our practice has evolved, and our current practice bears little resemblance to that of twenty years ago. A number of comparisons are highlighted in table 1. The longer hospital stay and the increased incidence of atrial fibrillation reflect the higher risk profile of our patients.

The future of cardiac surgery in Malta is largely influenced but international trends. Continuing professional development, including conferences, seminars, hands-on hospital visits, proctoring, and most importantly, the training of our future surgeons in large units abroad, will assure the maintenance of a high quality service. Our relatively small unit provides a diverse and comprehensive cardiothoracic service comparable with that in larger countries. The immediate challenges facing our surgeons involve advances in the fields of surgery for atrial fibrillation,<sup>9</sup> more complex mitral valve repair,<sup>10</sup> corrective surgery for annulo-aortic ectasia,<sup>11</sup> and minimally invasive cardiac and thoracic procedures. To guess the evolution of cardiac surgery in the distant future is to venture into the unknown. What is sure is that more collaboration with interventionalists is essential, and the future cardiac surgeon must be trained in open as well as percutaneous skills.<sup>12,13</sup> 