

Fear of Floating: the Rise and Fall of the Flotation Catheter

Dr Judith Foy

Friday 1st April 2022

Imperial Hotel, Llandudno.

Care of the critically ill requires haemodynamic monitoring so that therapeutic interventions, usually, volume replacement or vasoactive drugs, may be determined. The introduction of the pulmonary artery flotation catheter (PAC) in 1970 revolutionised such care. It is widely believed that the idea of 'floating' catheters into position came to Drs Jeremy Swan and William Ganz while observing yacht sails on the sea at Santa Monica : thus was born the Swan-Ganz catheter. Physiological changes could now be observed and monitored at the bedside, no longer requiring the transfer of unstable patients to the catheter lab.

Introduction of catheters into the human heart was attempted by Werner Forssman in 1929 He inserted a urinary catheter into his own right atrium exhibiting a triumph of curiosity and bravery over personal safety in order to demonstrate the possibility of direct measurement of intracardiac pressures.

The credit for founding the science of cardiac catheterisation goes to Andre Cournand who was awarded the Nobel Prize in 1956

The 1960s saw the first use of a floating pulmonary artery miniature catheter in man by Professor Ron Bradley at St Thomas's Hospital. In 1968, with Dr Margaret Branthwaite, cardiac output was measured by thermodilution using a thermistor-tipped catheter and they explored the use of pulmonary artery diastolic pressure as an index of mean left atrial pressure . Around this time these pioneers received a visit from Jeremy Swan ,an Irish cardiologist working in the USA, who showed great interest in their work and how they were measuring cardiac output by thermodilution. Within the year, the Swan-Ganz catheter was launched with no mention of its British origins.

The use of Swan-Ganz catheters proliferated in the years after its introduction so that many clinicians, including myself, felt that no complex case could be properly managed haemodynamically without its use. Complications occurred in the hands of inexperienced enthusiasts and its use declined when randomised clinical trials failed to confirm benefit. There had been a failure to appreciate that the pulmonary artery catheter was a diagnostic rather than a therapeutic measure.

The use of the Swan- Ganz in Cardiff has been supplanted by PICCO (pulse contour cardiac output) using transpulmonary thermodilution and arterial line pulse contour analysis. Nevertheless, the Swan -Ganz catheter is still used in selected patients particularly in the USA and regarded by many as the gold standard.

The accepted tale, however, of the 'discovery' of the principle of the flotation catheter by observing sailing boats off the coast of California seems to have been just a flight of lucrative blarney after all.