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Interventional Radiology Celebrates 50 Years Of Angioplasty

Interview with Prof. Duncan Ettles, President of the British Society of Interventional Radiology

On 16 January 1964 at the University of Oregon Hospital in the United States Dr. Charles Dotter (pictured) performed the first percutaneous transluminal angioplasty procedure. Inserting a Teflon catheter into a patient's superficial femoral artery, Dr. Dotter opened a blockage in the artery to restore blood flow and eliminated the need for amputating the foot.

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Dotter used one of the first commercially produced catheters to carry out the procedure after meeting the catheter manufacturer, Bill Cook, at a medical trade show the previous year. Cook had recently started his own company and was displaying how Teflon tubing could be shaped using a blowtorch to create a catheter that could access a blood vessel through a needle puncture, rather than by opening the body surgically for access. Together Dr. Dotter and Cook visualised and designed the starting blocks for the future of minimally invasive medical treatments. This was the birth of interventional radiology.

It is estimated that more than 60 million vascular angioplasties have been performed worldwide since Dotter introduced the procedure. This versatile technology is now used to open blocked vessels throughout the body, often as an alternative to surgery. Risks of interventional procedures are rare, due to improvements in equipment, the way they are used and better patient selection.

Further Advances

HealthManagement spoke to Prof. Duncan Ettles, President of the British Society of Interventional Radiology about angioplasty's success, potential and future.

Angioplasty has proven success for treating blood vessels in the legs, heart and many other parts of the body. The technique heralded the introduction and development of other interventional procedures which have become increasingly important in the treatment of cancer.

Prof. Ettles cited two such successful catheter techniques for cancer treatment. TACE (transarterial chemoembolisation) is a technique whereby the catheter tube is passed directly into blood vessel close to the location of the cancer to inject chemotherapy drugs. Similarly, for radiotherapy, SIRT (selective internal radiotherapy) takes radioactive particles and directs them to the area where the tumour is located. RFA (radiofrequency ablation) is also increasingly used. Under local anaesthesia a probe is passed through a small incision in the skin and can either burn the cancer away using radiowaves or freeze it with cryoablation.

"There are now many different ways of treating a tumour without the need to remove the organ or make a large incision. These are important applications in interventional radiology to treat cancer", said Prof. Ettles.

Future of Angioplasty

Drug-eluting stents and drug-eluting balloons are currently important areas of research. Researchers will continue to experiment and research with these techniques, particularly to prevent the re-narrowing of blood vessels which can happen after the initial treatment.

Interventional radiology has been at the forefront of most of these techniques in the UK, but more consultants are needed. Prof. Ettles noted, "We know from recent NHS workforce surveys that IR is still understaffed by about 200 consultants in the UK. We continue to stress that it is very important to provide 24/7 coverage across England, for example to treat potentially fatal bleeding in young women following childbirth and in other emergencies.

Angioplasty and related techniques will continue to evolve, added Prof. Ettles. "Angioplasty equipment has been made much smaller in size and

so a procedure that used to require an overnight stay in hospital now takes only a couple of hours. Patient acceptability and safety will continue to increase. With new devices such as stents and drug-eluting balloons, long-term outcomes of these procedures will get better and the range of patients who can be treated will increase, particularly patients with cancer.”

“Robotics will develop further. For example, if we scan a patient and find a blockage in an artery or a cancer, we will be able to programme that dataset into a machine and a robotically controlled device can target that lesion, tumour or malformation very accurately and probably treat it without the need for a human operator to perform the whole procedure.”

Future challenges will also include increasing obesity and associated diabetes around the world, which will mean more arterial disease, stroke, heart disease and diseases of the blood vessels.

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