Successful cardiac massage 100 years ago

I recently asked a group of my (much younger) medical colleagues when they thought cardiopulmonary resuscitation had come into routine clinical practice in this country. The consensus view was 'about the middle of the last century, the 1950s'. They were surprised when I told them that they were wrong by many decades.

It is quite true that in the 1950s there was a surge in interest in cardiopulmonary resuscitation, with especial regard to closed-chest cardiac massage. Together with my anaesthetic consultant colleague at that time, the late Dr Stanley Feldman, I published one of the first books on the subject in 1967, entitled 'Principles of Resuscitation'.

This year marks the 100th anniversary of a landmark in the cardiac resuscitation story. A young surgeon at the Belgrave Hospital for Children in London, Lionel Norbury, published a ground-breaking article in the 4 October 1919 issue of *The Lancet* entitled 'Cardiac massage as a means of resuscitation'.

Norbury first reviewed the numerous experimental studies, going back to 1874 (first by Moritz Schiff, Professor of Physiology in Geneva, Switzerland), which were usually performed on dogs who had been submitted to cardiac arrest, either by an overdose of anaesthetic or by electric shock. Cardiac massage was then performed by manual compression of the heart, either through the opened chest or by opening the abdomen and compressing the heart rhythmically across the diaphragm, with variable success in restoring normal cardiac pulsation and recovery of the animal.

Norbury made the important comment that, in these experimental studies, 'when fibrillary twitchings of the heart occur as the result of massage, instead of normal contractions, it is very improbable that a successful result will be obtained'. No doubt he is referring to ventricular fibrillation, long before the electric defibrillator came into use.

Norbury recommended the abdominal route for heart massage, especially when the abdomen is already open or, if not, through a vertical incision through the upper part of the left rectus abdominis muscle, which is split. Alternatively, an upper midline incision may be used.

Norbury stated: 'I have had occasion to employ this method in some 14–16 cases with successful results in three, not including several cases of temporary stoppage of the heart in which the abdominal cavity was already open, and immediate massage restored circulation.'

Of Norbury's three successes, the first was a woman operated upon for a ruptured abdominal ectopic pregnancy. 'When the operation was nearly completed, the heart and respiration ceased. Artificial respiration was immediately commenced. After a very short period of massage, a contraction of the heart was felt, but regular contraction was not noted until about 1 minute after massage had been commenced. I am glad to say that the result was permanently successful'.

The second patient was a small child suffering from empyema. The heart and respiration ceased on the start of chloroform anaesthesia. Artificial respiration was started and after 2 minutes the abdomen was opened and cardiac massage commenced. Within a very short time a contraction of the heart was felt, and spontaneous pulsation quickly followed. Sadly, the child died 2 weeks later of bronchopneumonia.

The third case was a soldier anaesthetised with chloroform and ether for scraping of a sinus in his amputation stump. He suddenly stopped breathing and no pulse was felt. The abdomen was opened through the left rectus muscle and cardiac massage commenced. After about 30 seconds, a cardiac contraction was felt and soon rhythmic contractions were established and breathing returned. Recovery was complete. In this case, massage was started about 2 minutes after arrest occurred.

Norbury noted that most successful cases 'for the most part have been patients suffering from an overdose of anaesthesia, usually chloroform'. Indeed, it was this that led to the abandonment of chloroform as an anaesthetic.

Norbury concluded his paper with the following wise advice: 'Never give up a case of apparent death under an anaesthetic as hopeless until cardiac massage and its various accessories have been given a fair trial'.

Norbury claimed no priority for his successes, indeed, he quoted the successful case of Sir Arbuthnot Lane, of Guy's Hospital, reported by his anaesthetist, Dr EA Starling, in the *Lancet* in 1902. Here, cardiac massage was performed via the abdominal incision during an appendicectomy on a 65-year-old man. The patient made a complete recovery.

Lionel Norbury, the son of a naval surgeon, was born in 1882 in the Cape of Good Hope, where his father was serving at that time. Norbury entered St Thomas' Medical School as a student in 1899 and qualified Batchelor of Medicine and Member of the Royal College of Surgeons in 1904, proceeding to the Fellowship of the College 3 years later. He held a series of junior surgical posts at St Thomas' until 1907, when he was appointed to the prestigious post of resident assistant surgeon. In 1914, he was appointed to the staff of St Mark's Hospital, London, but joined the Royal Army Medical Corps at the outbreak of the Great War in August that year. He served as surgeon at Netley Military Hospital for the duration of the war and was awarded the Order of the British Empire at the end of the war for his services.

After the war, he was appointed to the surgical staff of the Royal Free Hospital, the West Middlesex Hospital and the Belgrave Children's Hospital; his especial interest was proctology. He died in 1967 aged 85 years.

I met him several times at the Royal College of Surgeons but, until researching his *Lancet* article of 1919, I had no idea that he was a pioneer of cardiac resuscitation. **BJHM**

Conflict of interest: none.

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