William Morton: pioneer of general anaesthesia

On 16 October 1845, a minor operation was performed at the Massachusetts General Hospital, Boston – the removal of a benign lump in the neck of a 20-year-old man, Gilbert Abbott, by the senior surgeon, Dr John C Warren. Why was this such a landmark occasion in medical history? Simply, it was the first public demonstration of the use of a general anaesthetic, ether, administered by William Morton, a local dental surgeon.

Morton was born in Charlton, Massachusetts in 1819 and began work at the age of 16 years in a local printing house. He then studied at the Baltimore College of Dental Surgery and, after qualifying, he soon joined Horace Wells in Hartford, Connecticut as a pupil and then joined him as partner. This year marks the 150th anniversary of William Morton's death, in 1868.

For centuries, surgeons had tried to assuage the agonies caused by their instruments. Alcohol and opium, alone or in combination as laudanum, were known to be of some help. In 1844, Horace Wells showed that the inhalation of nitrous oxide was of value in dental extractions but not in more major or longer procedures. William Morton found that ether applied topically to painful tooth sockets would produce somnolence. He tried the effects of inhalation of ether on dogs, on his assistants and on himself. Finally he used it successfully for dental extractions on his patients.

Morton rapidly developed a simple piece of apparatus, comprising a two-necked glass globe. One neck allowed ingress of air, and the other was fitted with a wooden mouthpiece through which the patient could inhale air, which was drawn over an ether-soaked sponge lying at the bottom of the jar.

Henry Bigelow, who had recently been appointed to the surgical staff at the Massachusetts General Hospital, read a newspaper report of Morton's work, went to visit his practice and was duly impressed by what he witnessed. He introduced Wells to Warren, who promptly invited him to demonstrate his apparatus on a patient undergoing surgery.

The operation, mentioned above, took 30 minutes. Abbott rapidly woke up and said that the whole procedure had been entirely painless. Everyone present agreed that they had witnessed an historic occasion.

It was now necessary to proceed to the crucial experiment. The new agent might be effective during the removal of a superficial lump, but would it work for a major, capital procedure, for example an amputation? A case was scheduled for 7 November 1845. The patient was a 21-year-old servant girl, Alice Mohan, who had been in hospital for 8 months with 'white swelling' of the knee – tuberculosis. The operation was to be performed by the house surgeon, with Warren and Bigelow in attendance,

Morton administered ether with his apparatus; after some coughing, the patient became insensible. Hayward rapidly performed an above-knee amputation. Alice quickly woke from her sleep without realizing that she had had her operation. As might be imagined, the medical audience clapped and shouted with excitement; what they had witnessed seemed little short of a miracle! The patient recovered well and was discharged home for Christmas.

The news of Morton's success spread with amazing speed throughout the civilised world. It is possible to trace the date of arrival of the Boston newspapers and mail with the use of ether in the hospitals in that area just a few days later.

For example, in December 1845, Francis Boott, a medical practitioner trained in America but living in London, received a letter from Bigelow giving a full account of the events in Boston. Boott encouraged James Robinson, a nearby dentist in practice in Gower Street, to extract a molar tooth from a young woman using ether. The procedure was a complete success. Robinson went on to write the first textbook on the use of ether the following year. To this day you can see a commemorative blue plaque on the wall of the building in Gower Street at the site of Robinson's house.

Francis Boott then told Robert Liston, Professor of Surgery at the nearby University College Hospital, of the news from Boston and of Robinson's success. Liston promptly had Morton's apparatus made by William Squire, a 21-year-old medical student, and obtained a bottle of ether from Squire's uncle, a local pharmacist. Just 2 days after the dental extraction performed by Robinson, Liston carried out an above-knee amputation on a butler who had been admitted to hospital 2 months previously with chronic osteomyelitis of the tibia. The operation went smoothly and was greeted with excited cheers by the staff and students, who had crowded into the operating theatre to witness the experiment.

The last 20 years of Morton's life were sad and dominated by conflict between himself and Crawford Long, a medical practitioner in Jefferson, Georgia, over priority for the use of ether. Long had frequently inhaled ether and had noticed that he might acquire knocks and bruises under its influence without remembering the trauma. From 1842 onwards he had used ether in his practice to carry out minor operations but did not publish his work till after Morton's successes. Morton himself expended much time and effort in the hopeless task of trying to patent the medical use of ether under the name of 'Letheon'. He gave up dentistry, became a farmer, ran into serious financial difficulties and died of a cerebral haemorrhage in July 1868, aged 48 years.

The inscription on Morton's tomb, in Mount Auburn Cemetery, Boston, reads: 'Inventor and revealer of inhalation anaesthesia: before whom, surgery was agony; by whom, pain in surgery was averted and annulled; since whom, science has control of pain'. **BJHM**

Conflict of interest: none.

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