Benjamin Brodie’s infamous case of Isambard Kingdom Brunel and an inhaled gold coin

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On 27 June 1843, Sir Benjamin Collins Brodie, first baronet (1783–1862) read a paper to the Royal Medical and Chirurgical Society in which he described a case involving Isambard Kingdom Brunel (1806–1859), the brilliant engineer of the Great Western Railway, bridges and steamships. Brodie had read several landmark papers to the Society but this was to be his most famous.

Brodie was born on 8 June 1783 at Winterslow, Wiltshire. His father was Peter Bellinger Brodie (1742–1804), rector of the parish, and his mother Sarah (1755–1847), daughter of Benjamin Collins, a banker and printer in Salisbury. Brodie was educated by his father and then went to London to study medicine. He read anatomy under John Abernethy at St Bartholomew's Hospital and James Wilson at the Hunterian school in Great Windmill Street. At around this time, he became a close friend of the surgeon William Lawrence.

In 1803, he started his surgical studies at St George’s Hospital, becoming a House Surgeon in May 1805 and then Demonstrator in the anatomical school. He became a Member of the Royal College of Surgeons on 18 October 1805. He was elected Assistant Surgeon to St George’s Hospital in 1808, and was made Senior Surgeon in 1822, a post that he held until 1840.

Brodie's interests spanned physiology, surgery, and psychology. He demonstrated the control of gastric secretion by the vagus nerve at the Royal Society (to which he was elected on 15 February 1810) and gave the Croonian lectures there in 1810 and 1813. The Royal Society awarded him the Copley medal in 1811, its youngest ever recipient.

Overwork led to a breakdown in 1815 and he stopped experimenting. His marriage to Anne Sellon yielded four children, of whom one, Sir Benjamin Collins Brodie (1817–1880), became a distinguished chemist known for his investigations on the allotropic states of carbon and for his discovery of graphitic acid.

Brodie then devoted himself to surgery, becoming particularly interested in joints. In 1813–1815 he published three papers in the Medico-Chirurgical Transactions that became the basis of a major treatise on orthopaedics, Pathological and Surgical Observations on the Diseases of the Joints (1818). This important book, in which he used case histories to teach

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surgeons limb-preserving surgery as opposed to amputation, went through five editions and was translated into several languages. The text included the first clinical descriptions of ankylosing spondylitis and of hysterical pseudofracture of the spine. In the fifth edition (1850) he identified Brodie's disease, a chronic synovitis of a joint, often the knee. He described the first subcutaneous operations for varicose veins in a paper in the *Medico-Chirurgical Transactions* in 1816. He described a technique for trephining the tibia for chronic inflammatory changes in 1828, pioneered a technique for correction of anal sphincter abnormalities in 1835, and identified a form of breast tumour following puberty (Brodie’s tumour) in 1840. In *Lectures Illustrative of Various Subjects in Pathology and Surgery* (1846) he described claudication for the first time in humans.

In 1819, he moved to Savile Row for his private practice and was appointed Professor of Comparative Anatomy and Physiology at the Royal College of Surgeons. While he held this office, he was summoned to attend George IV to assist on the removal of a tumour from the king’s scalp. He became the king’s personal surgeon in 1828 and attended him during his final illness in 1830. When William IV succeeded to the throne, Brodie was made Sergeant-Surgeon in 1832, a post he continued under Queen Victoria. He was made a baronet in 1834 and President of the Royal Medical and Chirurgical Society in 1839, where he first introduced discussions during meetings. In 1844, he was elected President of the Royal College of Surgeons and the first President of the General Medical Council in 1858. In the same year, he became the first surgeon to be elected President of the Royal Society. His last public appearance following his wife’s death in 1861 was at the Royal Medical Chirurgical Society on 31 December 1861. He died at his
stately home in Broome Park, Betchworth, Surrey on 21 October 1862 from a shoulder swelling following a riding accident in 1834.

In this famous case that Brodie related, Isambard Kingdom Brunel had been entertaining children after dinner when he inhaled a half-sovereign, which lodged in his right bronchus. When the coin refused to move, he consulted Brodie, who made several unsuccessful attempts to remove it. Brunel designed and constructed a movable platform with hinges to which he was strapped. His head was lowered to angle of 80 degrees to the horizontal and his back was repeatedly struck. Brodie next tried an artificial opening into the trachea but was unsuccessful in trying to extract the coin with forceps. Six weeks later, Brunel was again strapped to the platform and Brodie kept open the tracheal incision while Brunel was struck on the back. At last, ‘two or three efforts to cough followed, and presently he felt the coin quit the bronchus, striking almost immediately afterwards against the incisor teeth of the upper jaw, and then dropping out of the mouth; a small quantity of blood, drawn into the trachea from the granulations of the external wound, being ejected at the same time’. Although the story became legendary and was reported in many publications, this personal account in the *Medico-Chirurgical Transactions* is the most accurate.

**Eponyms associated with Benjamin Brodie**

*Brodie’s abscess*: a chronic bone abscess surrounded by dense fibrous tissue and sclerosis
Brodie's bursa: the medial subtendinous bursa of the gastrocnemius muscle or the bursa of the semimembranosus muscle

Brodie’s disease: chronic hypertrophic synovitis of a joint, often the knee (Brodie’s knee)

Brodie’s serocystic disease (Brodie’s tumour): a form of benign postpubertal breast tumour

Brodie-Trendelenburg test: for assessing valvular damage in veins

Brodie’s pile: a mass of inflamed anal mucosa at the lower end of a fissure in ano

Selected bibliography by Benjamin Brodie

Pathological and Surgical Observations on Diseases of the Joints (1818)

Lectures on the Diseases of the Urinary Organs (1832)

Lectures Illustrative of Certain Local Nervous Affections (1837)

Hunterian Oration (1837)

An Introductory Discourse on the Duties and Conduct of Medical Students and Practitioners (1843)

Lectures Illustrative of Various Subjects in Pathology and Surgery (1846)

Psychological inquiries: in a series of essays (1854)

Physiological researches. Republished from the ‘Philosophical Transactions’ (1851)

Smoking or no smoking? That’s the question. With observations by ‘Scrutator’ and extracts from an occasional paper by Dr Copland (1860)
the case which I have just related, the symptoms described by the patient led all those who were consulted to believe that the foreign body lay in the right bronchus; and this opinion derived confirmation from some experiments made formerly by Mr. Aston Key, and lately repeated by myself and others, in which it was ascertained, that a coin of the size of a sixpence or half-sovereign, if dropped into the trachea of the dead body, almost invariably fell, by its own weight, into this part of the air-passages. It was evident that the weight of the half-sovereign rendered it nearly stationary in the ordinary position of the body; and to this circumstance may mainly be attributed the comparatively trifling inconvenience which the patient suffered. But it is not to be supposed that the ultimate danger of the case, if the foreign body had been allowed to remain, would have been therefore less; and the records of surgery furnish abundant evidence that, under such circumstances, disease of the lungs sooner or later is induced, and that the death of the patient invariably ensues.

The narrow space which a half-sovereign would occupy in the bronchus, sufficiently explains the failure of the stethoscope as the means of diagnosis. It would appear, however, that even under more favourable circumstances, we cannot, in cases of this description, rely on the information which is afforded to us by the use of this instrument. Mr. Hodgson of Birmingham has furnished me with the history of a case which fell under his observation, in which the berry of a plant called the bladder-fern, of the size of a large pea, had found its way into the trachea of a boy six years of age. On repeated examinations with the stethoscope, nothing unusual was observed in the state of the respiration; yet, on the seventh day after the occurrence of the accident, the child suddenly expired, and on inspecting the trachea afterwards, the berry was found lodged in it about an inch below the tricuspid cartilage. Mr. Phillips, surgeon to the St. Mary-le-Bone Infirmary, and librarian of this Society, has informed me of another case, occurring in a little girl two years of age, in which a physician, much accustomed to the use of the stethoscope, had examined the chest with that instrument several times, and in the most careful manner, without detecting anything peculiar in the respiration; yet it was ascertained after death, that a portion of the claw of a lobster was firmly fixed in the trachea, a little above the level of the upper margin of the sternum.

I have already stated, that in making the artificial opening into the trachea, we had two objects in view; and it has been shown, that in the attainment of one of these, our success was as great as our most sanguine desires could have led us to anticipate. Although, before the opening was made, the experiment of inverting the patient on the platform was productive of a most distressing and long-continued struggle in the muscles of the glottis, no such spasm occurred afterwards. The half-sovereign escaped through the aperture of the

glottis, as easily as it would have done in the dead body; and the small quantity of blood which was ejected at the same time, and which had been manifestly furnished by the granulations of the external wound, sufficiently explains how this happened: as it is not to be supposed that blood could have been drawn into the trachea without the admission of air into it at the same instant. As connected with this part of the case, it may be well here to mention, that the distressing sensations arising from congestion in the vessels of the brain, while the head was in a depending position, were immediately and completely relieved by supporting the forehead with the hand, so as to keep the occiput in some degree inclined towards the back of the neck.

In the other object, for which the artificial opening was made, it must be confessed that we were wholly disappointed. In the dead body, with the assistance of proper forceps, there is no great difficulty in extracting a sixpence or a half-sovereign from the bronchus. But even here it is not always accomplished on the first trial. If the forceps be, as they ought to be, carefully and gently handled, the blades may actually slide over the surface of the coin without any sensation being communicated to the hand of the surgeon which will make him aware of the circumstance: or they may be passed downwards on one side of the bronchus, while the coin lies on the other. In the attempt to seize it, the forceps sometimes grasp the bifurcation of the trachea, or one of the subdivisions of the bronchus, instead of the foreign body.
Foreign Body in Right Bronchus. 297

fatal to the patient! It was these considerations which made us cautious in the use of the forceps in the first instance, and ready to abandon it afterwards, in favour of a safer method of proceeding.

The foregoing observations are of course intended to apply only to cases like the present, in which the foreign body is lodged in the bronchus or in one of its subdivisions. When it is impacted in the trachea itself, there can be no doubt that it ought to be removed by the forceps, and that this may be safely and easily accomplished. But under all circumstances, we have a right to conclude, that an artificial opening in the trachea must contribute to the security of the patient, and that the establishment of it at an early period, is the first and most important duty of the surgeon.