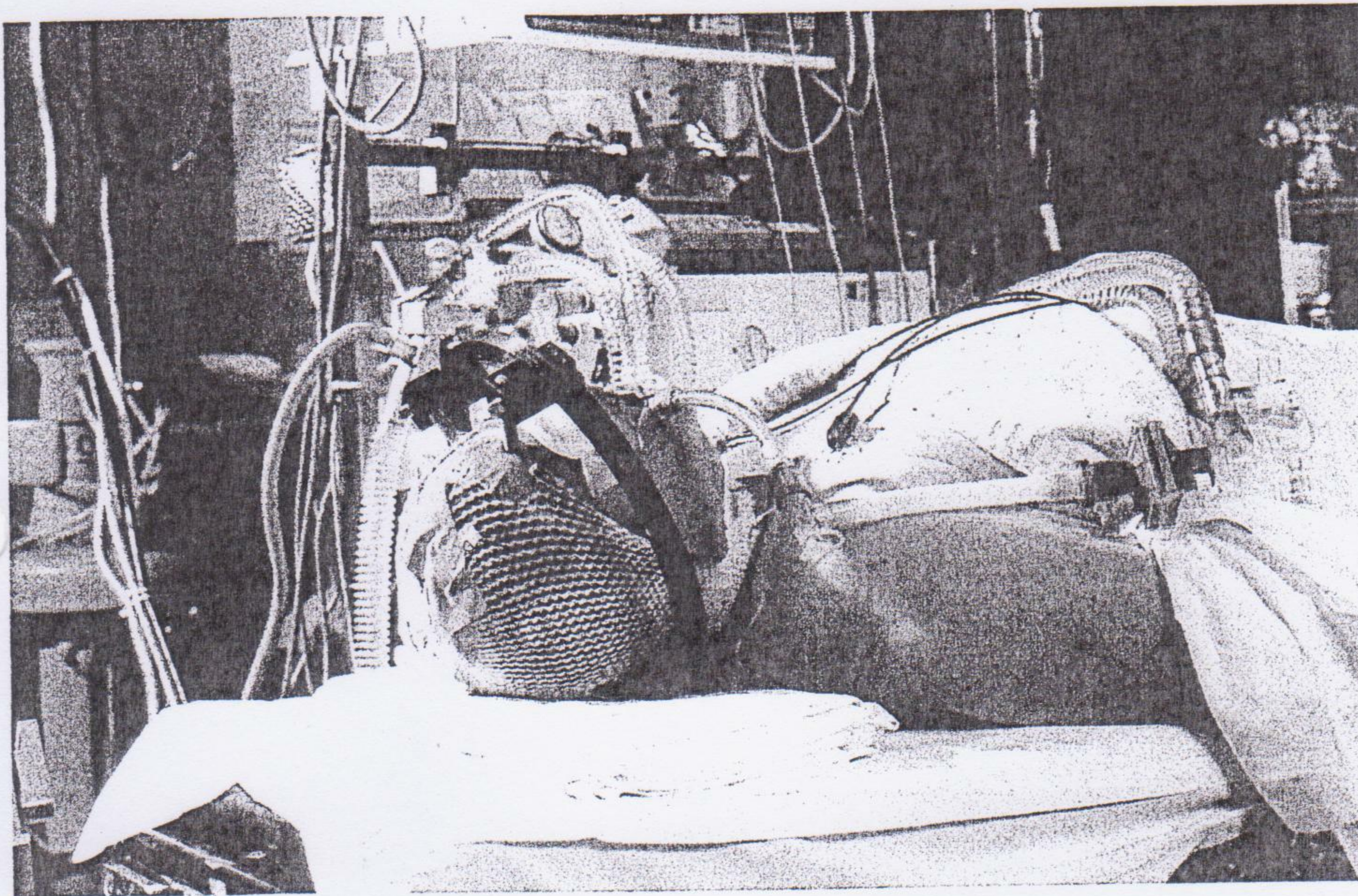


Psychology applied

This column looks at some of the many ways in which different types of psychology can be put into practice, in clinical, educational and occupational settings. Here, **Alison Lee** discusses the history of psychosurgery.

Does psychosurgery work?



BSIP, CC Studio/SPL

The term psychosurgery refers to any operation performed on the brain to alleviate the symptoms of mental illness. The most famous example of psychosurgery is the prefrontal leucotomy (or lobotomy) devised by Egas Moniz of Portugal in 1936. This procedure requires the surgeon to enter the brain and disrupt the pathways running from the prefrontal cortex to the rest of the brain. Moniz believed that such surgery would revolutionise the treatment of those suffering from otherwise untreatable mental illnesses. It was considered to be a last resort therapy, especially useful for the treatment of schizophrenia. Moniz published the details of his treatment in an age when the mentally ill were still routinely incarcerated in institutions and sedated. At the time it seemed like a miracle cure.

It is believed that Moniz got the idea for the leucotomy after hearing a conference paper about how chimpanzees became 'more cooperative' after both frontal lobes had been removed. The chimps became less frustrated about performing memory tasks, although they made more errors than they did before the operation. Moniz reasoned

that if chimps showed less anxiety after the procedure, the same operation might reduce anxiety in humans.

A leap of faith

The extent of Moniz's leap of faith in trying this procedure in humans is quite staggering to consider now. In the 1930s, very little was known about the functions of the frontal lobes. The information we did have was mainly from cases such as Phineas Gage, who lobotomised himself accidentally with an iron bar in a blasting experiment. Gage went from being a God-fearing, careful and considerate person to being abusive, lacking in motivation and totally unreliable. Although his 'lobotomy' only affected one side of the brain and the extent of the damage was not surgically controlled, evidence such as this did not bode well for the Moniz frontal leucotomy procedure.

The original Moniz operations injected alcohol directly into both sides of the brain. He injected alcohol (which is known to kill brain cells) into both sides of the frontal lobe) and then disrupted about 1 cm³ of tissue with an instrument called a leucotome. Most of Moniz's original patients

suffered from severe anxiety, depression or schizophrenia. After the surgery was performed on 20 patients, Moniz published his results. Physical recovery seemed rapid (although the operation sounds horrible, it is relatively simple) and two thirds of the patients were quieter, less anxious and/or less paranoid. Moniz (1937) said in his article, 'I do not wish to make any comment since the facts speak for themselves.' A new era of treating the severely mental ill had begun and Moniz won the Nobel prize in 1949.

Further developments

However, the surgery cannot have been quite as successful as Moniz stated. Letting the 'facts speak for themselves' got him off the hook in terms of describing more negative alterations in the patient's behaviour, as we will see.

The leucotomy crusade was continued by Walter Freeman in the USA. He developed an alternative procedure, going into the brain via the eye socket and using an ice pick-like instrument to destroy the prefrontal cortex. By 1951, it is estimated that 18,000 patients had undergone the procedure (Braslow 1999) and that these patients were generally the long-term institutionalised, who were either excessively anxious or violent. Freeman was not as blasé about the results of the operation as Moniz had been. He was careful to stress that the procedure was the only way of helping patients whose life was being destroyed by crippling mental illness.

The patients have become more placid, more content and more easily cared for by their relatives...We wish to emphasize that indiscriminate use of the procedure could result in great harm...Every patient probably loses something by this operation, some spontaneity, some sparkle, some flavour of the personality.

Freeman and Watts (1937)

Also consider the following exchange between doctors, found in case notes from a Californian hospital, in an excellent paper by Braslow (1999):

Dr A: [Before lobotomy] she was regressed an awful lot — she was in restraint most of the time, would spit at people and break things up.
Dr B: [Lobotomy] leaves them all pretty flat and indifferent about things. It seems to be characteristic.

Dr A: There is not much animation any more.

Dr C: Maybe that is what cures them.

The craze for leucotomies began to wane in the 1950s, largely as the result of follow-up studies that revealed the true cost of leucotomy. Patients no longer showed anxious or violent behaviour, largely because some of them showed no behaviour at all. Leucotomy left patients lethargic and unresponsive, with dulled emotions. Their personalities were irrevocably altered, and perhaps even destroyed by this procedure. The ethics of performing this surgery, even on the most institutionalised patients, were examined. To this day, there is an organisation trying to get Moniz's Nobel prize revoked (www.psychosurgery.org). The more we find out about the frontal lobes, the more reckless the surgery seems. In fact, we got a great deal of information about the functions of the frontal lobes by studying the effects of leucotomy. Moniz and Freeman's operations were the equivalent of using a sledgehammer to crack a nut.

The future

Although neurosurgery is still a scary prospect, it is a field that has improved dramatically. The advent of neuroscanning means that surgeons can pinpoint smaller areas of the brain for removal. Modern stereotactic neurosurgery can be used to treat some people with depression and obsessive compulsive disorder (not a disorder that Moniz even considered). Rather than remove a large area of the frontal lobes, modern techniques can highlight and destroy one circuit of them, such as the orbitofrontal circuit involved in emotion and mood.

It is still important that psychosurgery is used only to treat people with no other recourse — it is still an operation that destroys part of the brain — and it is also important to realise that it is not always successful. In some ways, current psychosurgeons, like Moniz, are still ahead of their time.

Further reading

Braslow, J. T. (1999) 'Therapeutic effectiveness and social context: the case of lobotomy in a California state hospital, 1947–54', *Western Journal of Medicine*, Vol. 170, No. 5, pp. 293–96.



National Library of Medicine/SPL

Egas Moniz performed the first lobotomy in 1936

Freeman, W. J. and Watts, J. W. (1937) 'Prefrontal lobotomy in the treatment of mental disorders', *Southern Medical Journal*, Vol. 30, pp. 23–31.

Moniz, E. (1937) 'Prefrontal leucotomy in the treatment of mental disorders', *American Journal of Psychiatry*, Vol. 93, pp. 1,379–85.

Alison Lee is Senior Lecturer in Psychology at Bath Spa University. She is a neuropsychologist primarily interested in visuospatial processes, especially in Parkinson's disease.