

WARNING: live

Britain's bravest brain surgeon

Professor Tipu Aziz is a world famous neurosurgeon who has recently defied violent threats from animal rights extremists to speak out in favour of vivisection. *MS* meets with Prof. Aziz to learn about the life behind the knife



Kate Stein
Culture Editor

TIPU Aziz is a consultant neurosurgeon in Oxford and a leading researcher into Parkinson's Disease (PD). He has pioneered the use of Deep Brain Stimulation, a surgical procedure which can dramatically halt the crippling symptoms of Parkinson's, a disease which affects 1 in 100 people over 60. Here, small electrodes are implanted in the brain, which inhibit the areas known to be overactive in the condition. Prof. Aziz performs this kind of brain surgery three times a week and it is estimated that about 40,000 people around the world have benefited from the techniques he has developed.

Prof. Aziz has faced criticism because he uses primates in his research exploring the circuitry underlying Parkinson's. Recently, he decided to speak out in favour of animal experiments, causing a public furore. As a result, he has been repeatedly threatened by animal rights campaigners. But he is undeterred in his mission to tell the public the truth about animal experiments and why they are so important. *Medical Student* caught up with Prof. Aziz to talk tips for surgery, animal rights fanatics and what it's like growing up amidst civil war.

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How did you come to study medicine?

I grew up in Bangladesh where I missed out on ten years of schooling because of civil war. I came to England to get an education and I studied A-levels in Zoology, Physics and Chemistry. I became very inter-

ested in the neuromuscular junction of the nematode worm and I decided to study Physiology at UCL. One day, as part of my course, I attended a motor control lecture about surgery for PD. It turned out to be the most important lecture of my life because after that, I decided to train in medicine and then later specialize in neurosurgery.

Tell us about the lecture.

We were shown an old film from the 1950s of a surgeon operating on a shaky PD patient who had a frame attached to head. The surgeon had drilled a hole in the head and passed an electrode deep into the motor thalamus. When he heated the tip of the electrode up, the patient's tremor just stopped. I found it mesmerizing. It just seemed such a neat thing to do, to restore normality like that through drilling a tiny hole in the skull. I went into medicine to train how to do that sort of surgery.

Can you tell us about the history of surgery for Parkinson's Disease?

In the 1950s and 60s, many PD patients underwent brain surgery where electrodes were used to stop tremor. However, when L-dopa was introduced in the 60s, all PD surgery worldwide was virtually abolished for a few years. Initially, L-dopa was so successful that everyone believed it was the answer but this was until the crippling 'on-off' side effects started to manifest. When patients were on medication they would rive around, flailing their limbs uncontrollably, but when they were off medication, they'd be unable to move in tremor. L-Dopa was not all it cracked up to be, and there seemed nowhere to go until the monkey studies came along.

What do you mean by the monkey studies?

In the 1970s, tragically, a group of young Californian hippies began to suffer from PD because they took a pethidine



Undaunted: neurosurgeon Tipu Aziz leading a PRO-TEST march in support of animal experimentation

analogue called MPTP. This showed neuroscientists that we could create a monkey model of PD by using the same drug. These studies led to the discovery that an area that was never

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previously thought to be part of the PD circuit, the subthalamic nucleus (STN) was in fact overactive in PD. I thought it might be a good target for surgery to improve PD. So I made the monkeys Parkinsonian using MPTP, then I burnt out the STN. Suddenly the monkeys were able to move without the help of any drugs. It was miraculous; they were completely transformed to normality, as if they had woken up from anaesthetic.

How did these studies develop into deep brain

stimulation?

In the 70s, a French group showed that you could inhibit the subthalamic nucleus by implanting electrodes and stimulating them. That was more attractive option than burning the area out. Although this has been very successful for many patients, some people can not be helped by STN stimulation. Therefore, I then decided to investigate an area of the brain, deeper to the STN, the pedunculopontine nucleus (PPN). The PPN has now become another target for people with PD. These operations have helped many previously chairbound patients to return to a normal life. In fact, 40,000 people around the world have had operations like this since those first monkey experiments.

You have become a national spokesperson in support of animal testing. Why do you feel so passionately about this?

My career has been built upon the experiments that I have done with animals. Without the monkey we would never have understood PD. Animal experiments are essential to my work.

As a scientist and a surgeon I was always aware that animal research led to understanding of physiology of humans. Also, growing up in medical environment, seeing my dad in his lab, I realized it was a way of life. Computer models have huge limitations; you can only put into a computer what you already know. They can not give us information on biochemical reactions or physiological systems with anything that even approaches reality. Computers may have allowed us to design planes but we still don't know how a bird flies.

What would you say to people thinking of going into neurosurgery?

Neurosurgery is a wonderful field. You must like neurosciences and surgery and you must care about your patients. Surgery is an art form. I reckon its about 60% science and 40% art. Art is where your skills come into action. You can always tell very quickly who has a natural talent for surgery. *Complications* is a great book to read for budding surgeons - Atul Gawande is an extremely good writer.

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What were you like as a student?

I was fairly studious. As well as studying medicine, I spent a lot of my time going to lectures on war studies at King's which has a very famous department. Having lived through ten years of war I always wondered whether there was any philosophy behind it. Of course, there isn't; war is war. But I had to discover that for myself.

How do you think this has shaped you as a person?

My childhood in Bangladesh taught me that no stress in life could be more stressful than war. Perhaps this is why I can handle the stress that comes with being a neurosurgeon. Many of my relatives were killed in front of me, and living in that environment became a powerful impetus to work hard. I never wanted to return.

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Is it true you like to play *Chemical Brothers* during surgery?

I always play music whilst I perform surgery. I think its good for stressful situations. When I qualified as a consultant surgeon I realized with delight that I could play my kind of music in theatre. I often play the *Chemical Brothers*, I think they're brilliant.

What's your favourite...

Film? Blade Runner

Book? Flan O'Brien's *The Dalkey Archive*.

Food? Steak and chips.

Way to relax? Reading and smoking cigarettes.

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