

# August Bier: father of spinal and regional anaesthetic blocks

This year marks the 150th anniversary of the birth of August Bier, who introduced spinal anaesthesia after experiments on himself and his assistant, and who went on to develop the technique of regional anaesthesia which bears his name.

The alkaloid cocaine is extracted from the bush *Erythroxylon coca*, which is native to Bolivia and Peru and which was known to the locals as a euphoriant. It arrived in Europe in the mid-19th century. In 1884, Sigmund Freud, then a young neurologist in Vienna, was investigating this drug as a possible remedy for morphine addiction or for the treatment of neuroses. He noted its property of making the mouth numb when the drug was tasted.

Freud drew the attention of his colleague, a young trainee ophthalmologist, Carl Koller, who had already tried, without success, using morphine and other sedative drugs in an endeavour to find some means of providing topical anaesthesia for eye surgery. Koller tried the topical effect of cocaine placed in the conjunctival sac, first in animals, then on himself and his colleagues, and finally on patients. His 2% solution proved to be a total success and was rapidly introduced into practice. Freud, whose interest in anaesthesia was minimal, made no claim to the discovery. Carl Koller (1857–1944) achieved immediate fame. However, he had to leave Vienna after being involved in a sabre duel with a fellow reserve army officer and became a successful eye surgeon in New York.

In the same year as Koller's pioneering studies on instillation of cocaine into the conjunctival sac, William Stewart Halsted, who had established a reputation as a bold and original surgeon, began to experiment on himself and his two residents with the use of injected cocaine to block nerves for

surgical procedures, first using the mandibular nerve, then going on to perform brachial plexus, pudendal and tibial nerve blocks. Halsted was unaware of the grave addictive nature of cocaine and, by 1886, required admission to a psychiatric hospital. Halsted's two assistants never recovered. Halsted himself, now a changed man, did return to surgery, as foundation Professor of Surgery at the newly opened Johns Hopkins Hospital in Baltimore, but is thought to have become reliant on morphia. In the 1880s local anaesthesia using less toxic derivatives of cocaine came into widespread use.

Lumbar puncture as a safe routine investigative procedure was introduced by Heinrich Quincke of Kiel and by Essex

dle was correctly placed, there was a free flow of CSF, but the syringe of cocaine was found not to fit the needle. An important lesson was learned which has had to be re-learned by countless others – the importance of checking your equipment. Bier gave a good description of his own post-tap headache. Bier promptly performed a successful spinal anaesthetic on his assistant, which was a complete success and was celebrated with wine and cigars.

In 1908, Bier described his technique of intravenous local anaesthesia using procaine. The injection is made into a superficial limb vein below a tourniquet after the limb has been exsanguinated by elevation. It is a method which is still used and which bears his name – 'Bier's block'.

August Bier was born in Waldeck, Germany, in 1861 and graduated in medicine at the University of Kiel in 1888, where he became assistant to the famous Friedrich von Esmarch and was involved in the heady days of the transition to aseptic surgery. He succeeded Ernst von Bergmann as Professor of Surgery in Berlin. He was awarded an Honorary FRCS in 1913, a year before the

outbreak of the first World War. In that war he saved the lives of countless German soldiers by introducing the 'tin helmet'. In his later years, Bier became something of an eccentric, studying, for example, the use of homeopathic drugs in veterinary medicine. He died in 1949, aged 88 years, in Sauer in East Germany.

When I was a young surgeon, spinal anaesthesia was widely used, often given by the surgeon himself. In those pre-relaxant days, a high spinal had the advantage of also producing excellent relaxation of the muscles of the anterior abdominal wall. Over the years, it has been largely replaced by more modern, and safer, techniques, although it still finds a place for the single-handed surgeon in a third world setting. **BJHM**

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Winter in England in the same year, 1891. However, the first spinal anaesthetic had been carried out, inadvertently and in an animal, by Leonard Cooling, a neurologist in New York, when he pierced the dural sac while experimenting on spinal nerve infiltration with cocaine.

The first deliberate spinal anaesthetic for surgery in man was carried out by August Bier in Kiel in 1898, in the same institution where Quincke had already established the technique of lumbar puncture. Bier used 3 ml of a 0.5% cocaine solution in a series of six patients for lower limb surgery. Regional anaesthesia was successful, although headache, nausea and vomiting were noted as complications. To establish his faith in this technique, Bier then decided to undergo the procedure himself. Lumbar puncture was performed by his assistant, Dr Hildebrandt. The nee-

**Professor Harold Ellis** is Emeritus Professor of Surgery, Guy's, King's and St Thomas' School of Biomedical Sciences, London SE1 1UL