Headshaking is a facial pain syndrome in horses that has tragically been misunderstood as a behavioural problem for many years. There is now general consensus within the veterinary profession that Idiopathic Headshaking (headshaking for which no physical cause can be found) is caused by a form of dysfunction of a branch of the trigeminal nerve, known as the infraorbital nerve, that gathers sensory input from the face. Histological studies of this branch of the trigeminal nerve have not yet revealed any obvious pathology in horses with headshaking when compared with normal horses. However, work in this area continues and will likely be of great importance in the future treatment of idiopathic headshaking. Evidence that this particular nerve is central to Idiopathic Headshaking comes from nerve block studies where headshakers were analysed before and after infiltration of local anaesthetic around the nerve in question.

Current treatment options for idiopathic headshaking are limited. A surgical technique known as “caudal compression surgery” has provided the most promising prospect of long term cure for cases in which the only other option is euthanasia. This surgery involves the use of tiny platinum coils placed in the same bony canal that the infraorbital nerve runs through. The presence of the coils causes a marked inflammatory response in the nerve which brings around compression and permanent damage of the nerve. This means that the nerve is not able to detect sensory information and pain is therefore not perceived.

A 2012 study by Roberts et al. found an initial success rate of 63%. However, a major limitation of this technique is the high rate of complications. The most common complication was nasal irritation after surgery, which in two cases, was so severe euthanasia was required. It was postulated that this nasal irritation may have been caused by the ‘caudal nasal’ branch of the infraorbital nerve, which in some horses, is thought to branch off further back than the target site used for compression of the infraorbital nerve.

This post mortem study was therefore necessary to ascertain whether it would be possible to place the platinum coils further back in the bony canal, in an attempt to also block input from the caudal nasal branch in a greater number of horses undergoing caudal compression surgery. The study also looked at the width of canal occupied by the coils immediately after placement which provided information on the degree of compression caused by placement of the coils themselves. The study included nine cadaver heads, sourced from a local abattoir. In each head, coils were placed using the current anatomical landmarks on one side and further back on the other side. The heads were then imaged using Computed Tomography (CT) to accurately assess the position and form of the coils placed. Disappointingly, a more caudal placement of the coils was achieved successfully in only one of the cadaver heads. The heads were also dissected, which showed us that the coils make direct contact with the bone of the canal, which is known to be highly sensitive. This factor constitutes another potential cause of irritation for horses undergoing caudal compression surgery.

As an addition to the coil experiments, this study also included a pilot of a novel surgical technique, based on an operation used in human surgery for the treatment of Trigeminal Neuralgia which has some notable similarities to Idiopathic Headshaking. This novel technique included the use of small balloons, inserted into the bony canal in the same way as the coils. Insertion of the balloons was previously thought to be impossible, but this pilot study enabled placement of the balloons with relative ease. The CT images acquired also suggested that the balloons were capable of reaching the same anatomical site as the coils and producing the same degree of occupancy of the canal (and therefore presumed compression of the nerve). Potential benefits of using balloons over coils for caudal compression surgery include reduced costs, and a potentially less irritant implant, which may help to reduce the rate of post-operative nasal irritation. A clinical trial is now underway to assess the efficacy of the balloons in live patients.

The World Horse Welfare Undergraduate Bursary Scheme is available to veterinary students in their later years undertaking a degree course at a veterinary school in the UK or Ireland. Find out more at www.worldhorsewelfare.org/bursaries