

## **Case study 2 – Neurological injury. “Macy Grey”**

Injury to nervous tissue has the potential to produce the most debilitating types of dysfunction, reducing or even eliminating sensory and motor processes. Nervous tissue can be injured through several means but the types of neurological injury treated by physiotherapy have mechanical causes – entrapment or trauma. In the former nervous tissue becomes entrapped in a confined anatomical space and is commonly referred to as a “trapped nerve”. I commonly encounter and treat these injuries in horses’ necks. Nervous damage through trauma is caused by a direct mechanical insult to the tissue or by indirect forces applied to surrounding structures being transmitted to the nervous tissue, for example horses have been known to develop radial paralysis after surgery in which they have been recumbent for some time.

Whether the nerve recovers depends on the severity of the injury producing anything from a mild or brief block of nerve signal conduction (a so called “first degree” injury) all the way up to complete severance of the nerve trunk (a “fifth degree” injury)

In this photograph is an expensive thoroughbred yearling filly who had galloped at full speed into another horse in the field. She was immediately non-weightbearing on the left foreleg and obviously in considerable pain. Veterinary examination revealed that nothing was fractured but that she had damaged the supra-scapular nerve, which lies over the shoulder joint, and had developed a classic “sweeny”. In this particular case the level of damage was third degree. Third degree injury involves a loss of nerve fibre continuity with haemorrhage, oedema and ischaemia. The filly had significant swelling over the site of impact. Third degree injury results in complete loss of sensory and motor function. Recovery is typically quite protracted.



Supraspinatus  
Infraspinatus  
Atrophy of both  
muscles

Fig. 1 Note the atrophy of the shoulder muscles

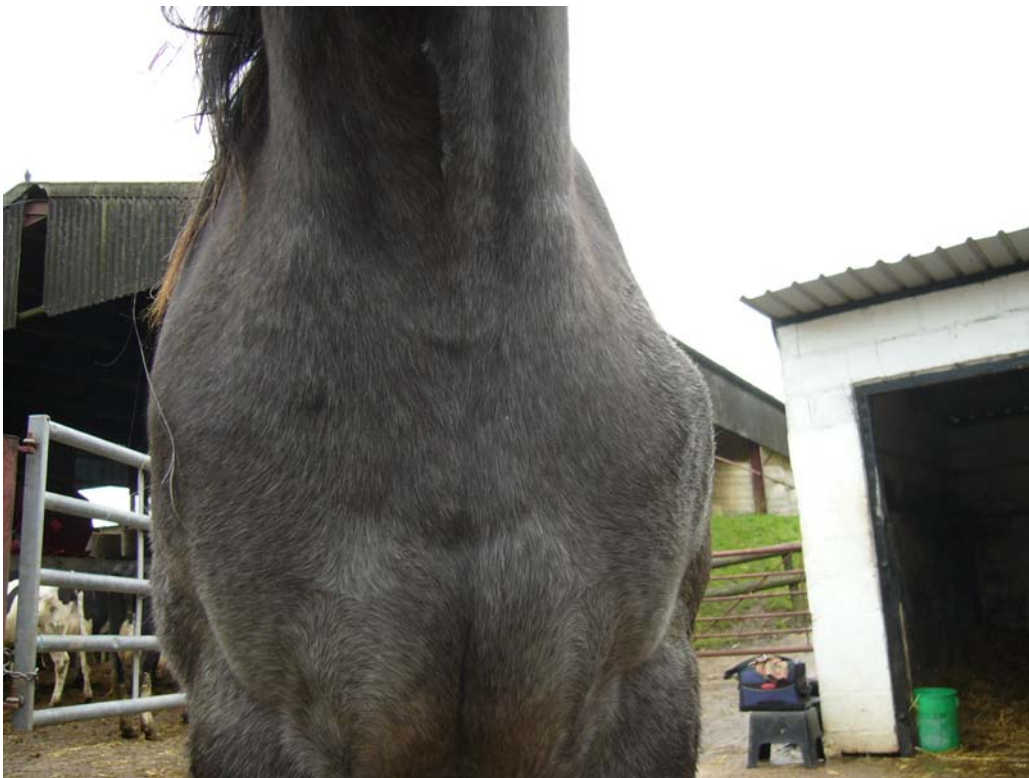


Fig. 2 Loss of muscle creates an unstable shoulder joint

When a nerve is damaged the muscle(s) innervated become paralysed and cease to function. This leads to atrophy of the muscle(s) and instability of the area of the body around the paralysed muscles. In this case within a day or two the infraspinatus muscle and part of the supraspinatus muscle had atrophied, making the entire shoulder unstable. Also, to complicate issues, the shoulder joint was subluxating every time she put weight on the left leg. This type of injury requires immediate physiotherapy treatment to obtain the best prognosis. The longer the injury is left without treatment will seriously impact on the recovery potential.

In this injury the most important factor in recovery is restoration of full neurological function as, without neural stimulation, the muscle will never recover and the shoulder will remain completely unstable. In this situation euthanasia may be the only course of action.

Therefore physiotherapy treatment will be targeted at treating the nerve and artificially stimulating the atrophied muscle until such time as the nerve responds. I have always found in this type of injury that therapeutic ultrasound is the treatment modality of choice for stimulation of neural repair. In the following picture you can see the use of ultrasound over the damaged area. The effect of ultrasound in this type of injury accelerates normal resolution of inflammation. This resolution is thought to be due to the gentle agitation of tissue fluid which may increase the removal of damaged tissue and the movement of particles and cells

I treated this horse twice a week for several weeks using ultrasound to stimulate neural repair and H-Wave neuro-muscular simulation around the joint to stabilize the joint and reduce inflammation. In addition the stable lass used a muscle stimulator over the atrophied muscles for 10 minutes every day. In this way the muscle could be stimulated externally preventing as much atrophy as possible.

After two months of intensive physiotherapy the muscle was returning and the shoulder joint had stabilized sufficiently for the filly to be turned out into a small field and a full recovery was expected. In these cases it is extremely important that physiotherapy begins as soon post-injury as is possible for the best outcome to be achieved. The following photographs show the same filly 6 months post-injury when an almost complete recovery has occurred.



Fig. 3



Fig. 4. Muscle has returned and the shoulder is now stable