Case reports

A tale of two foxes – case reports:
1. Radial nerve paralysis treated with acupuncture in a wild fox
2. Acupuncture in a fox with aggressive and obsessive behaviour

Lorena Lloret, Simon Hayhoe

Abstract

Case 1  This is believed to be the first report of acupuncture treatment for traumatic radial nerve paralysis in a wild fox. From the first treatment, improvement in the range of mobility and sensation of the limb was evident. Additionally, the attitude of this wild animal changed from fear and aggression to complete cooperation: he lay peacefully during every treatment in a calm, drowsy state.

Case 2  This reports the calming effects of acupuncture on a fox which had been showing aggressive behaviour and obsessive circling following toxoplasma infection.

Keywords

Acupuncture, case report, radial nerve paralysis, aggression, obsessive circling, veterinary practice, wild fox.

Case 1

Description of the case

A wild male fox, approximately one year old, had been hit by a car and brought to a wild animal rescue centre near Colchester in north east Essex, UK. The staff at the centre called him Charlie. He was referred to LL by a local veterinary practitioner with the diagnosis of radial nerve paralysis of the right forelimb.

At physical examination one week after the accident, Charlie seemed to be stressed and nervous but otherwise of normal mental state. It was a struggle to put a muzzle on him, and took several attempts before we were successful. The patient was unable to extend the right elbow, carpus and digits, and showed loss of extensor postural thrust and limb support. There was also loss of the triceps reflex. Cutaneous sensation was absent over the dorsal surface of the right paw and craniolateral surface of the right antebrachium, and there was muscle atrophy of the affected area. All these findings corresponded with the diagnosis of radial nerve paralysis.1

The traditional Chinese (TCM) diagnosis is that there is an obstruction of the flow of Qi and Blood to the muscle that results in lack of nourishment to the muscle, producing atrophy and paralysis.

Treatment and results

Standard Western treatment is conservative: allowing time, physical therapy and protection from further injury. These nerve injuries sometimes recover by themselves, but massage and physiotherapy may help. Amputation is not warranted until at least six months has past, unless there is other damage to the leg or it gets infected or troubles the patient, when amputation may become a necessary last resort.2

Acupuncture can be used in the management of radial nerve paralysis. Treatment consists in the use of local acupuncture points around the affected nerve, combined with corresponding distant meridian points. The success rate of acupuncture is likely to be inversely proportional to the degree of the nerve damage.3

From a TCM point of view, treatment is aimed to induce and promote the flow of Qi and Blood to the extremity. By improving the circulation the nerve tissue of the affected area can be nourished, thereby restoring the nerve function and reducing pain. Western acupuncture treatment is similarly aimed at improving circulation and reducing pain. Point selection is likely to be very similar using either approach, see Table 1. Points from among the first three groups were selected to obtain a desired effect.
at each session, depending on the fox’s reaction. The ‘major influence’ points were all used at every treatment, making up a maximum of nine acupuncture points per session, although more were used on the first day (Figure 1).

Treatment was performed using sterile disposable stainless-steel acupuncture needles with copper coil handles, size 15mm x 0.25mm, individually packaged with guide tubes (AcuMedic). Dry needling with a strong technique (deep insertion at 1cm to 1.5cm with intermittent manipulation of the point by twirling anti-clockwise) was used during the 15 minutes of each treatment.

Table 1  Acupuncture points used in Case 1

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local points cranial and caudal to the lesion along the Bladder Meridian</td>
<td>e.g. BL11, BL13</td>
</tr>
<tr>
<td>Additional local points</td>
<td>e.g. LI10, LI15, LI5, PC3, HT3</td>
</tr>
<tr>
<td>Distal points</td>
<td>LI4, LI7</td>
</tr>
<tr>
<td>Major influence points</td>
<td>GB34, ST36, LI11, GV20</td>
</tr>
</tbody>
</table>

To start the acupuncture treatment, a needle was first inserted at the traditional relaxation point GV20. Within a few seconds the fox had relaxed well, and a few minutes later, after the remainder of the needles had been inserted, there was no need to hold him any more. The animal’s breathing became deeper and the heart rate slowed, as if he were falling asleep.

The first five treatments were given on alternate days, combined with daily physiotherapy and massage of the limb. From the first treatment Charlie responded positively: by ten days the range of mobility of the elbow and carpus had greatly increased, with nearly complete recovery of extension...
at the elbow and approximately 80% of movement at the carpus. The sixth and seventh treatments were performed at weekly intervals, with continuing good progress.

In this case an important consideration is that the patient is a wild animal. A calm atmosphere is thus essential to achieve treatment. It was felt that a quiet approach with no stroking and a minimum of handling would suit Charlie best. No doubt the mental concentration and controlled calm of the staff helped to provide a relaxing ambience, but we would attribute the main calming effect to the acupuncture: not merely GV20, but the totality of acupuncture points selected and the degree of stimulation. His immediate psychological reaction during acupuncture and the consequent behavioural changes were really impressive. Indeed, most unusually for a wild animal, after the first treatment Charlie allowed us to put on the muzzle for each session without struggling, which could suggest a learning process: remembering the relaxing sensation felt during treatment. He also allowed the physiotherapy to his forelimb without objection. In short, he appeared to really enjoy the treatments. We would regard the effects of acupuncture on Charlie as those of a 'strong reactor' patient, more so than with any of the domestic animals LL has previously treated.

Quite commonly, as healing occurs, a tingling sensation is felt in the limb which may be uncomfortable to the animal, occasionally leading to self-attack. It had not been practical to have Charlie under constant observation or permanently muzzled (which would anyway have raised stress-behaviour problems); so one morning, frustratingly, we discovered Charlie had self-mutilated his foot. We had no option other than to amputate the limb. After this, prior to release, Charlie lived at the rescue centre, managing very well with just three limbs, being friendly with people and the other animals around him, and with no behavioural problems developing.

Case 2
Description of the case
A five year old vixen, named Maggie by the rescue centre staff, had been admitted four years previously with toxoplasmosis and infectious canine hepatitis. When toxoplasmosis affects the central nervous system, the neurological signs found depend on the location of the lesion. Thus a wide variety of signs and symptoms may be seen, including hyper-excitability or depression, paresis, paralysis and seizures. In Maggie’s case there was reduced sensation along the spine and loss of hearing, smell and vision. All these symptoms disappeared after treatment with clindamycin, but she then suffered from circling, nystagmus, aggressive behaviour and self harm, and started trying to attack other animals at the centre. These problems may have been due to the clindamycin or could equally well be a result of the toxoplasmosis; the previous notes are not clear on this.

Treatment and results
Despite anticonvulsant therapy (aimed at reducing the circling and having a general neurological calming effect) the problems had worsened over the course of the last year. The standard conventional treatment that had been tried initially, at various doses, was diazepam and phenobarbital. Later the staff had given her tablets of Valerian and Scullcap, a popular sedative herbal remedy for nervousness and excitability, and for epilepsy in domestic animals; none of the treatments had appeared to give benefit – indeed the symptoms had worsened – and all had been discontinued before acupuncture was started. At physical examination the fox appeared calm, but we muzzled her during treatment as a precaution. On palpation she was sensitive at BL20 (the Spleen Back-Shu point). No other tender points were found.

The aim of the acupuncture was to reduce the fits of obsessive circling, control aggressiveness and generally calm the animal to restore normal life and wellbeing. The local points GB20, TE17, SI9, and GV20 were used at each session, with the additional points SI3, LI4, PC6, BL20, SP6 and GB39 being used on an alternate basis depending on Maggie’s reaction to the acupuncture. Treatment was performed using the same type of stainless-steel needle as in the previous case, but sizes 30mm x 0.30mm and 15mm x 0.25mm were used. Acupuncture was performed with a strong ‘sedation’ technique (deep insertion at 1cm to 1.5cm with intermittent manipulation of the point by twirling clockwise) during the 10-15 minutes of each treatment. She was needled twice a week for the first two weeks and then treatment was extended to once a week for three more weeks.
Although stressed, Maggie is used to being with people so it was easy to approach and treat her. The calming effect of the acupuncture during the first few minutes after the needles had been placed was evident; she relaxed well so that there was no need to hold her, jawed frequently and felt heavier, falling into a dream-like state (Figures 2 and 3). She remained relaxed and drowsy for some time after each treatment session. Initially, when having a fit of obsessive circling, she used to race around in small circles until she fell over. In part this was due to habit, as she used to get attention for it, but any situation which caused stress (for instance having people around her) made the circling worse. After the first two weeks of acupuncture treatment she began making bigger circles and her aggressive biting ceased.

She is now receiving treatment once a week, which she seems to love. After a month of treatment, she was certainly more relaxed and friendly. We have put her in a shed that she shares with another fox and she behaves in a friendly manner towards him, as well as to the other animals at the centre when she goes out for a walk. The circling is still present, but not with its former frequency and intensity.

**Discussion**

There is now fairly wide experience in the West of acupuncture treatment for animals with a variety of neurological symptoms, both anatomical and psychological in character. Radial nerve paralysis
and other peripheral nerve damage have been shown to benefit from acupuncture treatment, but those cases reported have been in humans or in domestic or experimental animals, mainly horses, dogs and rats.\(^5\)\(^6\)\(^8\)

It is difficult to predict whether acupuncture will facilitate nerve regeneration, as the level of response will vary with each patient individually, and it will of course depend on the extent of the injury. Traumatic injuries to peripheral nerves can result in contusion of the nerve (neuropraxia), axon disruption with an intact sheath (axonotmesis), or nerve fibre transaction (neurotmesis). If the nerve is severed completely, acupuncture cannot be effective in restoring function.\(^2\)

Charlie’s leg responded quickly, with visible benefit within a few days of treatment. Although electromyography was not used to aid diagnosis or to quantify the degree of damage to the affected nerve, our impression is that the nerve damage was not too severe, so reasonable recovery was to be expected over time, even without treatment.

The addition of physiotherapy and massage is of real importance to both the speed and degree of restoration in limb function, producing relaxation of muscle and softening of other tissues, and improving circulation.\(^1\) Acupuncture itself can increase muscle and skin blood flow through mechanisms thought to involve the sympathetic nervous system and neuropeptides,\(^3\) but at least part of acupuncture’s beneficial effect on recovery following neurological damage is likely to be due to pain relief and relaxation allowing more effective physiotherapy.

However, the most fascinating aspect of acupuncture in both these case reports is the profound and immediate change in mood of the animals following needling. The stress reducing, sedative and relaxing effects of acupuncture are well recorded, yet the neuro-physiological mechanism is still very much open for discussion.\(^4\)\(^5\)\(^6\)\(^7\)\(^8\)\(^9\)\(^10\) The most obvious candidates to produce a sedative effect are serotonin and the endogenous opioids, notably ß-endorphin,\(^11\) but these are unlikely to act sufficiently fast to induce such instant relaxation as was seen in both these foxes. Campbell\(^1\) postulates limbic system involvement, possibly induced by γ-amino butyric acid (GABA) release, which could give a very rapid calming and euphoric effect.\(^1\)

This instant relaxation is certainly useful in treating a wild animal, but therapeutically a long term response is necessary; again this was achieved in both foxes. ACTH (and therefore cortisone) is reportedly released after acupuncture, and can induce a wonderful feeling of wellbeing resulting in a long term calming effect, although Carlson\(^1\) suggests that sufficient ACTH release could be expected only if the acupuncture is stressful.\(^1\)\(^5\) Perhaps, then, a possible agent that could account for this long term change away from aggressive behaviour in the foxes is oxytocin. This is likely to be released following gentle, non-noxious acupuncture and is known to have long term anti-stress effects, particularly with regular repetition of therapy.\(^1\)\(^6\)\(^7\)\(^8\)

The selection of points from a Western scientific basis is relatively straightforward for painful or anatomically-related neurological problems, but for central neurological damage causing alteration in mood and behaviour as in the case of our foxes, it seems reasonable to be guided by tradition. Acupuncture points were thus selected according to TCM principles.

From a TCM point of view,\(^9\) abnormal behaviour falls under the auspices of the Heart (Shen), but is usually treated by the Pericardium (guardian of the Heart): specifically PC6 is used, which also regulates Qi. Shen gives brightness to life and is responsible for consciousness and mental abilities. A disturbed Shen was manifest in Maggie as circling, head tilts, aggressiveness (biting), and lack of lucidity. Such mental or behavioural disturbances were considered to be caused by the normal fluids of the body becoming turbid, thereby clouding the mind. Disturbed Shen is traditionally calmed with GV20, GB20, PC6 and GB39.\(^5\)

Following the infectious canine hepatitis, according to the traditional approach Maggie will have had ‘Liver disharmony’, which is related to the TCM pathogen ‘internal wind’. The symptoms associated with this pathogen are similar to the behavioural changes of hepatobiliary disease in foxes: dementia, aggression, circling, ataxia, staggering and tremors. ‘Internal wind is dispersed by TE17, SI19, SI3, LI4, and GB20 which also ‘brightens the eyes’ and ‘clears the ears’.\(^17\)\(^18\) Wind disease may result in deficient Spleen Qi.

There is traditionally dependence between the Liver and Spleen,\(^5\) and in chronic hepatitis there is ‘Liver and Spleen Blood deficiency’. This is treated by tonifying Spleen Qi using BL20 and SP6. Abnormal
Liver function is said to obstruct the circulation of Qi. The flow of Qi is regulated by PC6, which also calms the mind by its indirect action on the Liver.20

In later treatments the traditionally calming point GV20 was replaced by the slightly more specific GV23/24 (the exact positioning is difficult to determine in animals) as these points are indicated for mental disorder, headache, anxiety, epilepsy and vertigo.21 Interestingly, most of the midline cranial (Governor Vessel) points have similar traditional indications, so it may be that accuracy of positioning is not critical.

Whether the result was specific to the points used or whether an alternative selection would have been equally effective cannot be ascertained from simple case reports, but overall Maggie has now become a calm fox, showing no signs of hostility such as biting or being grumpy, and the circling is more gentle in character and is substantially reduced. Thus acupuncture seems to have been effective in controlling this fox’s behavioural problems and has helped in rehabilitation. Charlie, likewise, lost his aggression following acupuncture and cooperated well with treatment, rehabilitating effectively to the point at which he could be released back into his natural habitat.

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Reference list


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