Case study of Bell’s palsy applying complementary treatment within an occupational therapy model

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ABSTRACT: For 7% of people with Bell’s palsy, facial impairment is permanent. The case study patient was a 48-year-old female who had no recovery from paralysis 12 weeks after onset. Goals were to restore facial sensory-motor functions, functional abilities and reduce depression. Facial paralysis was assessed by clinical observations, the Facial Disability Index and Beck Depression Index. Complementary interventions of aromatherapy, reflexology and electro-acupuncture were used with common physical agent modalities in an intensive home activity and exercise programme. The patient had 100% return of function and resolution of depression after 10 days of intervention. The limitation of this study is that it was a retrospective case study and the investigators reconstructed the case from clinical notes. Further research using a prospective approach is recommended to replicate this study. Copyright © 2009 John Wiley & Sons, Ltd.

Key words: aromatherapy, Bell’s palsy, complementary treatment, electro-acupuncture, physical agent modalities

Introduction

The purpose of this retrospective case study was to evaluate a complementary approach to occupational therapy-based treatment of a patient with facial paralysis, secondary to Bell’s palsy.
Incidence

Worldwide statistics indicate a frequency of Bell’s palsy to be about 0.02% of the population (Tha and Swierzewski III, 2008), with peak incidence between the ages of 15 and 40 years (Holland, 2004). It is more commonly seen in young adults and persons of Japanese descent (Swierzewski III, 2000). Men and women are equally affected, although the incidence may be increased in pregnant women and people with diabetes (Holland, 2008).

Etiology

Bell’s palsy or idiopathic unilateral palsy is an acute disorder of the cranial nerve VII that affects motor neurons for voluntary facial movement (VanSwearingen, 1998). The condition may arise overnight with maximized paralysis within 1 or 2 days. It may be preceded by otalgia, ear infection, oversensitivity or hyperacusis, low-grade fever, stiff neck, weakness and/or stiffness localized to one side of the face (National Organization of Rare Diseases [NORD] Database, 2008). An inflammatory process leading to ischaemia and/or compression of the cranial nerve VII damages the facial nerve. The clinical picture may involve unilateral flaccidity of facial muscles, an inability to close the eyelid fully or blink, excess or decreased tearing, drooling on the affected side, difficulty chewing, decreased perception of taste, pain or numbness behind the ear, and either numbness, pain or twitching of facial muscles on the affected side (NORD Database, 2008). In the landmark Copenhagen Facial Nerve Study lasting 25 years, Peitersen (2002) reported 1701 cases with Bell’s palsy, with 70% experiencing complete paralysis and chances of full recovery being 61%. The remaining 30% had incomplete paralysis with 94% achieving full recovery. Of those with complete paralysis, 85% experience spontaneous recovery within 3 weeks. The remaining 15% showed some improvement 3–5 months later. He reported that those showing no recovery in 6 months will have permanent loss of function and contractures. Prognosis for recovery is linked to age, symptoms at onset, and time until the first sign of remission, lack of post-auricular pain, normal taste and lacrimination (Peitersen, 2002).

Psychosocial issues

Untreated, Bell’s palsy will afflict some people with continued functional facial distortion that leads to diminished quality of life (Holland and Weiner, 2006). Disfiguring paralysis has an overwhelming psychosocial impact, especially in cases where the paralysis extends for long duration (Elliot, 2006). Batra and Batra (2007), in an occupational therapy study, stated, ‘Facial paralysis has been primarily considered a cosmetic inconvenience…(p. 39)’; but a Bell’s palsy chat website implies that only someone who has had similar experience can comprehend the depth of emotion and how intensely the self-esteem of
the individual can be affected by facial paralysis (Bell’s Palsy Information Sites, 2008).

Rumsey et al. (2004) reported psychosocial difficulties may include the perception of an altered body image, secondary to visible facial disfigurement, resulting in perceived social embarrassment. Bull and Rumsey (1988) confer manifestations of social discomfort, and awkwardness results in avoidance behaviours. Social situations bring challenges of distorted speaking and facial expression, resulting in altered self-image (Butler, 2000).

Medical options

The principles of medical treatment by physicians have remained relatively constant (Adour, 1982). Routine care involves a trial of antibiotics, antiviral agents, anti-inflammatory agents, corticosteroids and lubricating eye drops, or viscous ointments (Grogan and Gronseth, 2001). Surgical decompression of the cranial nerve VII may be non-restorative in 20% of cases (Sinha et al., 1994).

Other treatments are biofeedback (Dalla-Tofola et al., 2005), EMG and mirror feedback (Ross et al., 1991), periodic botulism toxin injections (Bulstrode and Harrison, 2005), hyperbaric oxygen (Holland et al., 2008), electrical stimulation (Ohtake et al., 2006), acupuncture (Liang et al., 2006), and chiropractic manipulation (Alcantara et al., 2003).

Current therapeutic interventions

Diels (1997) reported that occupational and physical therapists have been serving people with facial palsy since the 1920s. Physical therapy has been effective in reducing facial paralysis and improving functional outcomes (VanSwearingen and Brach, 1998). Physical therapy techniques have included kinesiotherapy, biofeedback, EMG (Dalla-Tofola et al., 2005) and active assistive exercise of specific facial movements (Elliott, 2006).

Occupational therapy

Five articles were identified in the occupational therapy literature. Several authors reported facial splints developed for facial paralysis (Jennerjohn, 1956; Kuntavanish, 1974; Pomerantz, 1974). Beals (1951) reported two case reports of success with home programmes using poetry recited with muscles on stretch in various head positions, resistive activities with candy suckers and pantomime of emotions. Cronin (1998) described neuromuscular facial retraining. Batra and Batra (2007) compared a conventional approach of facial massage, passive stimulation and exercise to occupational therapy treatment to a functional dynamic taping protocol for 30 matched subjects. Results evaluated by paired t-test showed that the taping was more effective at the p < 0.5 level.
As rehabilitation therapists who comprehend both the psychological effects of facial disfigurement and its impact on choices of occupation, there is a strong need for occupational therapists (OTs) to further explore their unique role and contribution to treatment of people with Bell’s palsy who are not progressing toward recovery. Furthermore, OTs have their focus on balance, occupational functioning, spirituality, lifestyle, physical activity, stress and sleep, which are all aspects of complementary medicine.

**Aromatherapy and acupuncture**

Aromatherapy can be defined as the art and science of using essential oils as a therapeutic option. In France, aromatherapy is a form of pharmacology and complementary medical treatment (Pénoël and Pénoël, 1998). Essential oils enhance the body’s ability to heal by activating the immune system, the endocrine system, the nervous system, the psyche and other systems of the body (Pénoël and Pénoël, 1998; Price and Price, 2007).

Acupuncture consists of inserting needles into specific points of the body known as acupoints, which helps to promote the adequate flow of vital energy throughout the body. Although aromatherapy and the therapeutic application of essential oils have been used for many decades in Western medicine, the combination of traditional Chinese medicine (TCM) and essential oils is a fairly recent modality. TCM recognizes 365 acupoints distributed throughout the human body. Each acupoint serves as an insertion point for an acupuncture needle. The same acupoints can also be a site for application of essential oils according to their chemical and medicinal properties (Willmont, 2007).

**Treatment of peripheral facial paralysis with electro-acupuncture**

TCM is based on balancing one’s energy system, which is not clearly defined in Western medicine. The etiology of peripheral facial paralysis is derived from an invasion of wind-cold, due to an underlying deficiency of qi (pronounced chi or chee). The blockage of qi (energy flow) causes illness. In facial paralysis, qi impacts the blood circulation in the channels and collaterals in the facial region. This leads to the stagnation of qi and blood. Placement of hair thin needles at points along energy pathways called meridians will restore flow and homeostasis, thus returning the body toward balance to resolve facial paralysis (Mayer, 2007).

Acupoints are selected based upon the distribution of the main branches of the facial nerve (CNVII) or by the pattern of differentiation. For the function and location of acupoints pertaining to the distribution of the main branches of the facial nerve (temporal, zygomatic, buccal and mandibular) used in the treatment of facial paralysis, see Lian et al. (2005).

Several Bell’s palsy studies show use of acupuncture compared to Western approaches. A collaborative Chinese and Western Medicine study occurred in...
a Chinese hospital with 83 subjects (Wang et al., 2004). The intervention group received physical therapy, acupuncture and medication. The control group had massage and functional exercise. Improvement of functional facial scores and index score was $p < 0.01$ over the control group, with the combined approach, suggesting that Chinese and Western Medicine work well together. A large randomized trial, 439 subjects in four Chinese clinical centers, verified the effects of acu-moxi treatment using the facial Disability Index (FDI) at $p < 0.05$ by providing acupuncture and moxibustion (a technique using heat of a burning moxa herb on acupuncture points to move qi) and comparing it with control groups receiving vitamin therapy and medication (Li et al., 2004).

Clinical features of the retrospective case

Ellie (fictional name), a 48-year-old married Caucasian female, was self-employed full time operating her own costume business. Her duties included facing the public daily with a ‘perfect smile’. After 3 weeks of a right ear infection with continued pain, Ellie developed Bell’s palsy (ipsilateral regional facial paralysis on the right). The otolaryngologist predicted she would have maximum recovery in 6 months and should return to the doctor at the end of that time period. Three courses of antibiotics did not appear to be resolving the bacterial process, as evidenced by the facial swelling on the right.

The home health OT requested the referral for evaluation and treatment, due to the patient’s history of depression and unresolved facial paralysis. Ellie had a history of pre-morbid conditions: a major depressive episode with suicidal ideation, neck pain, back disability, thoracic outlet syndrome, restless leg syndrome and sleep apnea. She was taking antidepressants. Post-paralysis, Ellie rarely left home, and when doing so, she held her head down and covered her mouth. She stated, ‘I will hide socially from others, quit my job and stay home’. Ellie was emotionally devastated stating, ‘My doctor doesn’t care’.

The initial occupational therapy evaluation was conducted 12 weeks following the onset of symptoms of facial paralysis, because the patient was not recovering spontaneously on her own, as 70% of cases do. Evaluation consisted of appraisal of her resting facial posture and active movements, with photos used for pictorial history of progress. Ellie presented with right side paralysis, swelling and markedly decreased sensation, intense otalgia and reduced tear production and irritating dry eye, but no hyperacusis or aural fullness. She had difficulty smiling, puckering, pursing lips, snarling and frowning, but was able to drink, eat and speak with normal tongue movements. She could only partially close the right upper and lower eyelids, which she taped to sleep. A positive Bell reflex in the right eye (Jelks et al., 1979) was found to be consistent with eye closure difficulty.

Facial posture revealed severe asymmetry with a right-sided droop. Voluntary movement was barely visible, whereas the uninvolved left side facial musculature was fully intact. There was a partial contraction of the obicularis oris, obicularis
occupi, corrugator and labii inferioris muscles. The occipitofrontalis and platysma muscles showed trace contraction. There was no perceptible movement of the zygomatic major and minor, levator anguli oris, levator labii superiouris, and labii inferioris muscles.

Case study methodology

This retrospective study used pre- and post-outcome measures with a patient who received occupational therapy intervention in 2003 for 5 days. To assess self-reported disability, two questionnaires were given at admission and 10 days later upon restoration of muscle strength and functional skills. The FDI is a 10-item self-report questionnaire that was normed on 46 patients with facial disability (VanSwearingen and Brach, 1998). It assesses the severity of the physical disability and the relationship between the impairment and psychosocial status occurring with facial nerve disorders. The FDI consists of physical function (items 1–5) and social well-being (items 6–10) subscales. The scores range from 0 (complete paralysis) to 100 (normal facial function) and from irritability and withdrawal (impaired function) to social comfort, calmness and peacefulness (social/well-being). The FDI is considered a reliable, valid instrument (VanSwearingen and Brach, 1998). Theta reliability scores were 0.88 for the physical function subscale and 0.83 for the social/well-being scale, and construct validity was correlated with physician examinations (VanSwearingen and Brach, 1998). The Beck Depression Inventory (BDI) is used worldwide as an indicator of the severity of depression that was normed on psychiatric patients (Beck, 1972). The BDI has 21 items that link attitude and symptoms to depression. The test–retest reliability was above 0.90, the Spearman-Brown correlation for reliability at 0.96, and the internal consistency of test items being 0.86.

Ellie's initial score on the FDI (VanSwearingen and Brach, 1998) revealed physical function subscale scores = 11/100; social/well-being subscale scores = 12/100 indicated moderate difficulties on both subscales. The BDI score of 25 indicated moderate depression.

Treatment intervention

Aromatherapy and electrical acupuncture (EA) were implemented along with traditional approaches to facilitate change. Familiar treatment modalities of ice, heat and vibration were used in addition to the complementary modalities to reduce the inflammatory response during the first 3 days, and to re-establish sensory and motor function in the face and restoration of functional activities during the remainder of treatment. The purpose of the home programme was to facilitate active movements and to restore habitual abilities like blowing, smiling, puckering, sniffing, flaring nostrils and frowning. Motor gains occurred quickly with the stimulation programme, after reduction of swelling and pain.
The first goal was to reduce swelling of the face, so that motor function could be achieved. To this end, diluted essential oils were applied to the face and feet with an infrared facial massager (available in retail stores), and hot caster oil compresses to infuse the oils through the skin, as Bharkatiya et al. (2008) reported that heat and moisture can increase absorption of the oils at the point of application. Subsequent to attendance at a medical aromatherapy course given in Las Cruces, New Mexico in 2003 by a physician who used medical aromatherapy in his medical practice, the OT consulted the physician by phone to discuss the case (Raphael de’ Angelo, personal communication, 17 April 2003). Dr. de’Angelo recommended a treatment protocol that included 12 drops of the blended essential oils called Breath of Life, Frankincense/Lavender and First Defense (Ancient Legacy, n.d.) that were added to 1 ounce of jojoba oil (as a carrier oil) and were applied to facial acupoints. In addition, Dr. de’Angelo recommended that a tea tree oil blend consisting of tea tree, eucalyptus and peppermint oil be placed behind the right ear along the mastoid process. Oils were applied as instructed to facial acupoints every 15 minutes for the first 2 hours, then during every waking hour for 3 days, and to foot reflexology points bilaterally, which were located on the balls of the feet, the weight-bearing area of the big toes, and the general area around and below the metatarsals. These points corresponded to primary reflex points for head and neck. Cold packs were applied three times daily. Initially, the patient ingested one to two drops of blended tea tree oil, eucalyptus and peppermint, directly on her tongue, without dilution to reduce the inflammatory and/or infectious process, every hour. The Pointer-Plus, an inexpensive battery-powered electrical spatial stimulator that finds the location of acupuncture points by generating auditory and flashing light cues, was used on an investigational basis to provide EA stimulation to facial points. The pulse frequency was fixed at 10 Hz. A sound and flashing light facilitates the detection of a point. Other devices for acupoint stimulation are Electro-Therapeutic Point Stimulation (ETPS) NeuroMechanical therapy (Hocking, 1998) and Acu-Health (Richards, 1989). Stimulation of various acupoints was performed to move energy and promote homeostasis. EA was supervised by an OT during the study, who was also an acupuncturist.

Outcome

On the first day, sessions began with the OT applying EA to acupoints with the Pointer-Plus device, followed by quick ice, vibration and tapping. The OT also applied diluted oils with the infrared massager to facial acupoints and feet. By the second day, Ellie and her husband had learned by demonstration techniques, pictures and foot reflexology maps to provide the above treatments, including quick ice, tapping, sweeping and vibration. Using these techniques repetitively, six to eight times daily, Ellie’s facial pain and swelling was abated by the third day. Once the swelling was under control, the patient was ready
for acupoint stimulation to facilitate motor function. Due to reduction of pain
and swelling, Ellie was able to perform approximations of muscle contractions
with contract and hold techniques, use of antagonist muscle co-contractions,
and practice of pucker, smile, frown, snarl and surprise facial expressions with
her husband in front of a mirror. An online website provided a list of exercises
that were turned into enjoyable games for her delight, to facilitate actions and
motions (Bell’s Palsy Information Site and Forums, 2000). For example, Ellie
would blow into a straw to make ink paintings or stack straws with her lips.
These occupation-based activities were enjoyable to Ellie, as they strengthened
her facial motions. As she became more adept, Ellie chose her stimulation activi-
ties and created her own games to play with family members.

By the fourth day, Ellie was able to whistle gleefully. Every improvement was
celebrated and reinforced by family members, building her enthusiasm with
every gain. Photographs were taken every day to show progress. On the fifth
day, Ellie had approximately 80% return of function. When she could kiss her
husband, she appeared to be restored to her fun-loving, giggly and playful self.
Ellie continued with her home programme of activities and exercises for five
more days, until she had regained full motor function. Initially, Ellie’s baseline
score on the FDI indicated scores on the physical function subscale of 11; social/
well-being subscale = 12, which indicated moderate facial disability and psycho-
social discomfort. The pretest Beck Depression Scale score of 25 indicated that
Ellie was moderately depressed. By comparison, post-test scores after 10 days of
treatment revealed FDI physical function subscale = 100 or full functioning, and
social/well-being = 80 indicated no difficulties. The final score on the Beck
Depression Scale of 1 indicated normal mood.

Role of caregivers in the intervention
Ellie and her family members were cooperative during a 5-day intensive multi-
sensory stimulation home programme, and later with a home exercise and
functional activities programme for five more days, until her full recovery. Ellie’s
recovery might have taken longer, had it not been for the devotion of her family
members and her belief that the OT could help restore her functional ability.
The OT communicated with the family daily to review the documentation of
all modalities performed on schedule and functional improvements.

Summary of the intervention and outcomes
In summary, the first goal was the frequent application of a systematic multi-
sensory complementary protocol to help decrease swelling, inflammation and
nerve compression. Once the oedema was reduced after 3 days, a 2-day protocol
was initiated to activate paralyzed musculature and improvement of functional
abilities. In total, the patient received 5 days of treatment with an intensive
barrage of sensory stimuli accomplished with a home programme that was implemented by her dedicated family members during waking hours. In 5 days, she experienced 80% return of sensory and motor function, and by the 10th day, she had complete return. Final post-test scores on the Beck Depression Scale revealed normal mood. Scores on the FDI indicated no facial disability and a sense of social comfort and well-being with the absence of paralysis. Facial symmetry was restored, as evidenced by photos for comparison.

Conclusion

Complementary approaches were used by the OT to treat a patient diagnosed with Bell’s palsy. A case study such as this stimulates a number of questions for readers. Would the patient have recovered without treatment given for 6 months? Would Ellie’s depression worsen without any intervention? Might there be a strong role for occupational therapy in early treatment of Bell’s palsy because of the intense psychosocial distress associated with facial paralysis? As OTs, we must broaden our skills by collaborating with other practitioners to advance our field. This case study suggests the need for OTs to broaden their horizons to look for solutions to problems that enhance functioning and provide the evidence to inform future practice.

Limitations

This pilot project provides an example of using aromatherapy and acupressure with a patient who has symptoms of Bell’s palsy. It is speculative as to whether the patient would have fully recovered motor function in 6 months without treatment (suggested by her physician) or whether she would have been among the unlucky who do not recover at all. However, this paper substantiated that the patient was significantly depressed about her facial distortion and frustrated by her lack of progress and subsequently made progress following the therapy protocol.

Implications

Experimental research is essential to evaluate a complementary protocol for subjects with Bell’s palsy who show no signs of recovery status post 3 months in comparison with control group members receiving traditional intervention, in order to advance practice and create new interventions.

Acknowledgements

The authors would like to thank the following for their guidance and support of this project: Wendy G. Spielman, MAOM, OTR, L.Ac; Raphael d’Angelo, MD, A.T.; and Alexandra Brighton, Master Blender.
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