

## Effectiveness of facial PNF along with effleurage in idiopathic facial nerve palsy – A case report

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### ABSTRACT

The outcome of Facial PNF Techniques, effleurage, and facial muscle exercises using visual feedback are described in this single patient research study. The most prevalent type of facial nerve palsy is idiopathic facial nerve palsy, which affects majority of people. It not only affects facial muscle actions but also affects the quality of life and well-being. As a result, we present a case of a 26-year-old woman who presented with facial nerve palsy symptoms and a 2-day history of ear pain. Various screening tests along with CT scans were performed for ruling out the cause of facial nerve palsy and Physiotherapy session were planned along with the medical management.

**Keywords:** Bell's palsy, Facial PNF, Quality of life, Effleurage.

### 1. INTRODUCTION

Idiopathic facial nerve palsy is characterized by the abrupt weakening of facial expression muscles on one side of the face. They commonly notice it, when the patient looks in the mirror or is noticed by the patient's family members. Salivating from the gumline is often the first complaint (Heckmann et al., 2019). When patients develop paralysis, they typically experience painful sensation just on the back side of the ear and loss of sensation on the ipsilateral face. Disturbed taste sensation and, less frequently, hyperacusis may be present in addition to the main complaint (paresis) (Tiemstra and Khatkhate, 2007).

The participation of the forehead muscles differentiates distal cranial nerve palsy from intrinsic seventh nerve palsy. If a frontalis muscle is working as normal but the lower and middle portions of the forehead are impacted, the damage is most likely intrinsic (supranuclear). This is due to the fact that the component of the seventh nerve nucleus that supplies the frontalis muscle receives afferent information from both brain hemispheres and hence functions correctly even if the lesion is unilateral. A lack of wrinkling of the forehead, low eyebrow position (eyebrow ptosis), partial lid closure, deviation at the corner of the mouth, and a loss of nasolabial fold are all common symptoms of peripheral facial nerve palsy (Yoo et al., 2020).

An unknown cause causes 60–75 percent of instances of peripheral facial nerve palsy, and aetiology may be found in the remaining 25–40 percent of cases, with neuroborreliosis and herpes virus oticus being the most common. Even when there are no erythematous blisters, herpes zoster should be considered as a possible cause in all instances (herpes zoster sine herpette). To rule out probable causes of peripheral facial nerve palsy, the clinical history (tick bite, redness migrans, and pain), clinical neurological examination, and ear inspection, which involves otoscopy but is difficult to distinguish from a central facial palsy, are all employed (de Almeida et al., 2014).

Infections such as HIV, human herpesvirus, rickettsia, cytomegalovirus, mumps virus, and rubella virus, as well as Lesion (Heerfordt syndrome), autoimmune disease, and carcinomatous meningitis are among conditions that can result in peripheral facial nerve palsy. Isolated facial nerve palsy, similar to Bell's palsy, can be due to a variety of disorders. Facial nerve compression and paralysis can be caused by structural diseases in the ear or parotid gland (e.g., cholesteatoma, salivary cancers) (Shokri et al., 2020). Lyme disease, otitis media, Guillain-Barré syndrome, Ramsay Hunt syndrome (herpes zoster outbreak in the facial nerve distribution), sarcoidosis, and various influenza vaccines are other etiologies of peripheral nerve palsies. These disorders can present as solitary facial nerve palsies, but they usually have additional characteristics that set them apart from Bell's palsy (Kim and Lee, 2020).

## 2. PATIENT INFORMATION

A 26-year-old female was admitted to the ENT ward with the chief complaints of left side facial paralysis, weeping from the left eye and difficulty to close the left eyelids. She also complained of the visible disfiguration of the angle of mouth to right for 1 day. The patient had these complaints since a day before she presented to the hospital. Along with this she also had a pain in the left ear for 2 days which was dull aching in type and diffuses in nature which was on and off type. The start of weakness was abrupt, and the weakness progressed gradually. There was watering from left eye which was watery in consistency, intermittent in type and since 1 day. The patient also had a history of dull aching headache which was on and off in nature. Apart from this patient had a positive history of fever 15 days back for which she took medications. There is a positive history of frequent episodes of sneezing and watery nasal discharge on exposure to dust.

## 3. CLINICAL FINDING

The patient was awake and alert, with a good sense of time, location, and person. The vital signs remained constant. On local examination of the preauricular, auricular and postauricular area, it was found to be normal bilaterally. The tympanic membrane was intact on the right side and the left side it was intact but thinned out. On facial nerve examination, there was a loss of motor function that is an inability to raise the left eyebrows, when a patient attempts to close his eyes his eyeball moved upward and slightly inward (Bell's phenomenon), on grimacing there was the deviation of angle of the mouth towards the right. On the left side there was an absence of nasolabial fold, creases, and skin folds of the face were smoothed. Retraction of mouth and pursing of lips was not possible. Assessment is summarized in table 1.

**Table 1** Faial Nerve Palsy physiotherapy assessment

Side of Face	Raise Eyebrow	Squint	Lift the corner of mouth	Pucker lips	Scrunch Face	Open mouth	Total
Left side	Deficient	Deficient	Deficient	Normal	Deficient	Normal	2/6
Right Side	Normal	Normal	Normal	Normal	Normal	Normal	6/6

On assessing the nasal cavity, there was a deviation of the nasal septum to the nasal mucosa. On assessing oral cavity, mouth opening was 4 fingers; hard palate showed the presence of multiple petechiae. A halt in blinking occurred on the affected side while tapping on the patient's glabella due to the affection of the ophthalmic branch suggesting a positive blink test. Schirmer test (evaluation of lacrimal gland) -When a folded strip of blotting paper was inserted in the lower conjunctiva instead of the customary side fornix, lacrimation was reduced by 75%. It's important to note that geniculate ganglion damage can cause bilateral lacrimal impairments.

**Diagnostic assessment**

Apart from physical examination, an MRI scan was used. MRI scan produces three-dimensional images of soft tissue using radio waves and magnetic fields. MRI scan helps to detect any compression of the nerve due to inflammation of structures around it. CT scan was done to identify any pathology in the lateral course of the nerve from porus acoustics to the stylomastoid foramen. Temporal bone CT detects the potential of intratemporal facial nerve along with the deviation in the course. No obvious abnormality was seen on the bilateral temporal bone. Other investigations including HIV and herpes were done for screening and ruling out the possible causes.

**Therapeutic interventions**

Combined medical and physiotherapy management has proved efficacious in treating subjects with seventh nerve palsy. In individuals with Bell's palsy, oral corticosteroids have typically been recommended to minimize facial nerve irritation. Prednisone was usually started at 60 mg per day and tapered off over ten days. Because HSV-1 may play a role in the cause of facial nerve palsy, antiviral medications such as valacyclovir (Valtrex) and acyclovir (Zovirax) have been investigated to see whether they can help with treatment.

A goal-directed physiotherapy plan of care was used to reduce edema, prevent synkinesis, and improve the power of facial muscles, resulting in near to complete restoration of facial symmetry as shown in Table 2 and Figure 1, 2 and 3. House Brackmann's Grading was used as an outcome measure. The intervention was given for 14 days and the grading was noted after 7 days and compared with the baseline grading, which was grade 4 that is moderately severe dysfunction on day 1.

**Table 2** Goal directed physiotherapy Approach in managing patient with Facial Palsy.

Intervention	Frequency	Intensity	Rationale
Eye closing exercise	10 Reps every 2 hourly	Active Assisted	It helps to improve lubrication of eye and strengthens the eye lid muscles
Active Assisted facial exercises in front of mirror	10 Reps , thrice a day	Isometric holds for 10s	Mirror helps to get visual feedback and helps to improve strength of facial muscles
Soft tissue mobilization (effleurage)	3 times in a week	5 minutes	Maintains circulation to the face as well as keep the face supple
Proprioceptive neuromuscular facilitation technique (Assisting on affected side and resisting on the unaffected side)	10 Reps 3 times daily	Activate the muscle as much as possible	Using the principle of irradiation it helps in strengthening of facial muscles
Balloon blowing and straw exercises	10 Reps twice a day	Holds for 5 second	Helps to improve strength of oral musculature



Figure 1- PNF for Frontalis muscle

Figure 2 - PNF for Risorius

Figure 3 – PNF for Buccinators

#### 4. DISCUSSION

Aranha et al., (2017), discovered that the Facial PNF treatment, which uses the irradiation principle to stimulate weaker facial muscles, was proven to be more effective than typical therapy measures for children with Bell's palsy, such as electric stimulation. The child's active participation and corrective perception also assisted recovery. According to Manikandan, (2007) similar encouraging report was discovered in a randomised control study in people with Bell's palsy. This was reported as being against RCT in a single case. Neuromuscular rehabilitation works. It offers distinct anti-synkinesis strategies based on the individual's function and facial nerve and muscle qualities. Patient happiness, self-esteem, and quality of life improve as a result of successful rehabilitation. When it comes to facial therapy, electrical stimulation should never be used. It is unneeded, and there are studies which conclude that it should be avoided. It's critical to treat synkinesis by inhibiting abnormally contracting muscles rather than stimulating flaccid ones. Electrical stimulation showed no significant benefits. When it comes to rehabilitation, patients with regional nerve injury are typically disregarded.

#### 5. CONCLUSION

PNF along with soft tissue mobilization through effleurage and facial exercises using visual feedback found to be beneficial for patient with idiopathic facial nerve palsy.

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#### Author's contribution

NHS conceptualized and took the case, SPP implication of treatment, SKK assisted in documenting the case. NHS wrote the manuscript. All the authors previewed and have approved the case report before submission

**Informed consent:** Written and oral consent was obtained from all individual participants included in the study.

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#### Conflicts of interest

The authors declare that there are no conflicts of interests.

#### Data and materials availability

All data associated with this study are present in the paper.

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