



Rehabilitation Program for Bell's Palsy Patients – Case Report

Dwy Ningsih¹, Agus Widodo², Ana Kusumawati³

¹Student of Physiotherapist Study Program, Universitas Muhammadiyah Surakarta, Indonesia

²Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, Indonesia

³Physiotherapist Dolopo Hospital

*Corresponding author: Dwy Ningsih, Email: dwyningsih2019@gmail.com

Abstract

Introduction: Bell's palsy is an idiopathic paralysis that affects more than half of the facial muscles due to injury at the bottom of the seventh cranial nerve, and symptoms of facial muscle weakness or total paralysis. Bell's palsy is an acute peripheral type VII nerve palsy whose cause is unknown. Bell's palsy is one of the most common problems affecting the motor neurons of the facial muscles both unilaterally and bilaterally. It affects function and quality of life. Therefore, physiotherapists focus on restoring facial function with different modalities as well as exercises.

Case Presentation: Patients complain thick on the face of the left, unable to close his left eye completely, unable to lift his left eyebrow and lip merot right. On examination of the muscles there is a decrease in muscle strength on the side of the face. The diagnosis for this patient's case was Bell's palsy.

Management and Outcome: Patients complain thick on the face of the left, unable to close his left eye completely, unable to lift his left eyebrow and lip merot right. Around 22:00 WIB on January 6, 2021, the patient felt half dizzy on the left side of his head and buzzing in his left ear. Because it is not strong enough to withstand the dizziness, the patient compresses with ice. In the morning when he woke up the patient felt a thick patch on the left side of his face. The patient looks in the mirror and notices changes in the face with drooping lips to the right

Discussion: Physical therapy is given to patients bell's palsy is to increase the strength of the facial muscles. The intervention given in this case is infrared to provide a relaxing effect and to increase metabolism, then electrical stimulation is given to stimulate weak muscles, massage is given with the aim of providing stimulation to the muscles which will later have the effect of increasing muscle strength, and the last is mirror exercise where this exercise is given to increase the functional activity of the patient.

Conclusion: In the case of Bell's palsy, physiotherapy programs in the form of infrared, electrical stimulation, massage, and mirror exercises can increase muscle strength and increase functional activity in patients.

Keyword : Bell's palsy, Massage, Mirror exercise, infrared, electrical stimulation



Introduction

Bell's palsy is a neurological disorder of the VII nerve which supplies the face. If the nerve is damaged it causes sudden weakness or paralysis of the muscles on one side of the muscle. The paralysis causes the paralyzed facial muscles to experience problems such as not being able to close their eyes or mouth. Sir Charles Bell a scientist from Scotland who first discovered this disease in the 19th century¹.

The incidence of Bell's palsy is around 23 cases per 100,000 people every year. Based on its clinical manifestations, sometimes the general public considers Bell's palsy as a stroke due to weakness on the side of the face or associated with a tumor so it is necessary to know the clinical application of Bell's palsy syndrome without forgetting that the differential diagnosis may be obtained from the same clinic².

Bell's palsy is the cause of facial paralysis which is often found, the incidence is about 75% of all facial paralysis. Incidence rates vary from country to country around the world. These differences occur because of the geographical conditions of each of these countries. The reported annual incidence ranges from 11-40 cases per 100,000 population. The peak incidence occurs between the second and fourth decades (15-45 years). There was no difference in prevalence by sex. The incidence is three times greater in pregnant women (45 cases per 100,000). As many as 6 5-10% of Bell's palsy cases are people with diabetes mellitus³.

Five possible causes of *Bell's Palsy* are ischemic, vascular, viral, bacterial, hereditary, and immunological². Meanwhile, according to⁴, the cause of *facial* nerve damage is often unknown, but viral infections (usually the herpes virus) are most often associated with the cause of *Bell's Palsy*.

In most people with *Bell's Palsy* the paralysis will recover, but in some of them the paralysis is cured by leaving residual symptoms⁵. The problem of disability caused by Bell's palsy is quite complex, which includes impairments (abnormalities at the organ level) in the form of facial asymmetry, stiffness and even contractures; disability or disability (at the individual level) in the form of limitations in daily activities in the form of eating and drinking disorders, closing the eyes, as well as speech and facial expression disorders; handicap (at the environmental level) in the form of a relationship in the profession, especially in the entertainment sector; and further problems in terms of the patient's psyche.

The signs and symptoms of *Bell's palsy* are unilateral facial paralysis and quite progressive, about half of all cases of *Bell's palsy* are paralyzed within 48 hours and the weakness reaches its peak in about 72 hours. Pain behind the ear or in the mastoid area. Inability to close the eyes due to weakness in the facial muscles which can lead to corneal exposure and drying. Loss of function of the *orbicularis oculi* muscle which can impair tear drainage. Weakness in the *orbicularis oris* muscle means that patients cannot control their mouth so they have difficulty



chewing and drinking⁶.

Physiotherapy measures given to reduce these symptoms are in the form of giving IR, electrical stimulation, massage, and mirror exercise. The benefit of being given IR is to be able to help the metabolic process and help increase blood flow to make it smoother. ES with faradic currents is given to increase the strength of the facial muscles in patients because the problem with Bell's palsy is a decrease in muscle strength. Because the problem in this case is muscle weakness, massage is given with the aim of providing stimulation to the muscles so that the muscles can contract again. As for mirror exercise, it is given to increase muscle strength and increase the patient's functional activity.

Case Presentation

This case *study* was conducted at a Puskesmas in Ngawi with a 39-year-old TNW patient who is Muslim and works as a driver.

Subjective Examination. Patients complain mer hope right into thick on the face of the left, unable to close his left eye completely, unable to lift his eyebrows left and lip merot right. Around 22:00 WIB on January 6, 2021, the patient felt half dizzy on the left side of his head and buzzing in his left ear. Because it is not strong enough to withstand the dizziness, the patient compresses with ice. In the morning when he woke up the patient felt a thick patch on the left side of his face. The patient looks in the mirror and notices changes in the face with drooping lips to the right. On the date of 11 January around 09:00 pm the patient went to the UPT Puskesmas Geneng. Then the doctor refers the patient to the physiotherapy room for therapy. The patient's condition now does not complain of dizziness on the left side of the head, the mouth is still drooping to the right, the left eye is still not completely closed, the eyebrows are still difficult to move, there is still a thick feeling on the left side of the face. The patient has no past medical history, co-morbidities, and family illnesses who have Bell's palsy.

The aim to be achieved is the increasing strength of the muscles face that lesin reduce the sense of rigid and thick, and increase the ability of functional activity in patients who use the muscles of the face such as eating, drinking, gargling, talk, close the eyes and the expression of the face.

Physical examination. The physical examination carried out here starts from general examinations such as vital signs, to examinations that are specific to the case. Physical examination here is an important examination because it will help to establish a physiotherapy diagnosis.

This vital sign examination is also an important examination because from this examination it can see how the general condition of a patient is and to evaluate whether therapy can be carried out or not.



Table 1. Vital Sign Examination

Inspection	Results	Category
blood pressure	120/80 mmHg	Normal
pulse pulse	75 x/ min	Normal
Breathing	22 x/ min	Normal
temperature	36 C	Normal
BMI	25.7	Normal

The patient's general condition is still in good category so the patient can still continue therapy and do some exercises to reduce the disturbance experienced by the patient.

IPPA examination or inspection inspection palpation percussion and auscultation. But the examination is carried out according to the patient's needs or symptoms of the patient. For these patients only in ilakukan inspection and palpation examination. Static Inspection : The face looks droopy to the healthy side of the face (right) or looks asymmetrical (the left cheek is down); The height of the right and left eyebrows is not the same or the left eyebrow (sick side) is lower than the right eyebrow (healthy side); Slightly watery eyes, especially in the left eye (the painful side); Mouth appears drooping to the right (healthy side); Left lip slightly down ; The right nostril (the diseased side) looks asymmetrical with the left nostril (the healthy side). Dynamic Inspection: Asymmetrical forehead wrinkles, namely the left forehead (sick side) is lower than the right forehead (healthy side) when smiling or speaking; The left eye (pain side) has not been able to close tightly when closed; Alis k envy can not be removed; No visible wrinkled nose on the left side; Mouth still can not close when washing; Inflating the nose is still not symmetrical between the nostrils; Smiling, whistling can't be perfect. Palpation ; When do the examination palpation by way of giving a little pressure on the face there is a spasm of the muscles face next to the left.

Furthermore, a basic movement examination is carried out to determine the movement ability of the patient. For active movement examination, the patient is able to raise his eyebrows and close his eyes but not completely. Then to move the mouth and whistle the patient is able but still asymmetrical.

Muscle examination conducted to determine the ability o tot in these patients. This examination was performed using manual muscle testing (MMT). Examination results :

Table 2. Examination of muscle strength is carried out with MMT

Muscle Name	Sinistra	Dextra
M. Frontalis	1	5
M. Corrugator Supercilli	1	5
M. Orbicularis Occuli	1	5
M. Nasalis	1	5
M. Zygomaticum	1	5
M. Orbicularis oris	3	5
M Buccinator	3	5



Value 0; no visible contraction, Value 1; minimal contraction, value 3; contraction up to symmetrical side of normal with maximum effort, value 5; normal with maximum effort

Can be seen from the results above the average value of muscle strength is one exception, to the muscle orbicularis oris and buccinator which means that the patient is only able to move contraction minimal and the value 3 is contracted until the symmetrical sides normal to attempt a maximum.

For a special examination here using the Ugo Fish Scale, which is an examination of the functional ability of facial muscles with the Ugo Fisch Scale assessed in 5 different positions, namely when silent, frowning, closing the eyes, smiling, and whistling. With the following results:

Table 3. Results of Ugo Fish . examination

Shut Up	20	X	0%	= 0
wrinkled forehead	10	X	30%	= 3
Close your eyes	30	X	0%	= 0
Smile	30	X	30%	= 9
Whistling	10	X	30%	= 3
Amount				= 15



Picture 1. Condition of the patient before therapy

Management and Outcome

Complaints of the patients their taste thick on the face side left, was not able to close the eyes of the left with a perfect, and not able to ngengkat brow next to the left and then the physiotherapist provide therapy programs as well as exercises for the provision of IR, Electrical stimulation, massage, and mirrors exercise for 3 therapy times. Evaluation is done after therapy. From the therapy program that has been given to the patient, the following evaluation results are obtained:

The results of the evaluation of the functional ability of facial muscles using the UGO FISH scale obtained the following results:

Table 4. Evaluation Results of Ugo fish



T1	Shut Up	20	x	0%	= 0
	wrinkled forehead	10	x	30%	= 3
	Close your eyes	30	x	0%	= 0
	Smile	30	x	30%	= 9
	Whistling	10	x	30%	= 3
	Amount				= 15
T2	Shut Up	20	x	30%	= 6
	wrinkled forehead	10	x	30%	= 3
	Close your eyes	30	x	30%	= 9
	Smile	30	x	30%	= 9
	Whistling	10	x	30%	= 3
	Amount				= 24
T3	Shut Up	20	x	30%	= 6
	wrinkled forehead	10	x	30%	= 3
	Close your eyes	30	x	70%	= 21
	Smile	30	x	30%	= 9
	Whistling	10	x	30%	= 3
	Amount				= 42

For the ability of functional muscle face by using a scale ugo fisch there is a change in therapy to 2 and to 3 with a value increase of therapy to 2 are numbered 24 and therapies to 3 are numbered 42 .

The next evaluation is evaluating the value of facial muscle strength . Just as with the evaluation of Ugo Fisch , an evaluation is carried out after treatment for 3 times the meeting . The evaluation results can be seen in the gam ba r below.

Table 5. Evaluation of facial muscle strength values

Muscle Name	Sinistra		
	T1	T2	T3
M. Frontalis	1	1	3
M. Corrugator Supercilli	1	1	3
M. Orbicularis Occuli	1	3	3
M. Nasalis	1	1	3
M. Zygomaticum	1	3	3
M. Orbicularis oris	3	3	3
M Buccinator	3	3	3

Based on the table above , found no increase in the ability of the muscles in therapy to 2 and to 3 with an increase in the average of the initial meeting of the value of the ability of the muscle 1 into three , namely the ability of the muscle is able to resist gravity .

Discussion

With the provision of *infrared* , it can increase metabolic processes as has been stated by Van't Hoff's law that a chemical reaction can be accelerated in the presence of heat or an increase in temperature due to heating. So that the metabolic process in the superficial layer of the skin will



increase so that the provision of oxygen and nutrients to the tissues will be improved, as well as the removal of waste from the rest of the combustion through sweat. And with an increase in temperature it will cause vasodilation, which will cause an increase in blood to local tissues, especially in superficial tissues, this is very useful for increasing blood supply to the treated tissue. Thus, relaxation will be easily achieved if the muscle tissue is warm and there is no pain. Radiation from *infrared* rays in addition to reducing pain, can also increase the temperature of the tissue so that it can eliminate muscle spasms and make muscles relax so that it can reduce numbness or thickness⁷.

According to⁸ infrared which produces heat has an effect on the superficial dermis and epidermis, which will produce vasodilation resulting in increased blood circulation, it has the benefit of providing a warm and calming effect, resulting in increased blood circulation resulting in an increase in oxygen supply. in the illuminated area.

Faradic currents stimulate motor nerves, with sufficient intensity to stimulate the muscles innervated by the *facial nerve*. *Faradic* currents cause *tetanic contractions* due to repetition of the stimulus 50 times per second. This type of contraction used for a long time can cause muscle weakness. Therefore, to prevent muscle weakness, the form of wavy *faradic* currents to cause muscle relaxation. When the current is made wavy, the strength of muscle contraction will increase and decrease alternately so that it is similar to voluntary contraction. With stimulation of sensory and motor nerves, there will be an increase in muscle strength⁹.

The mechanism of *electrical stimulation* (*faradic*) in increasing muscle strength, with stimulation of the *mitiris nerve*, action potentials occur in nerve fibers so that it can cause voluntary and repeated muscle contractions in individual facial muscles which aims to retrain work and muscle function and trigger the occurrence of pumping action with the aim of improving blood circulation so that it can increase muscle strength. With stimulation that can provide facilitation through the *muscle spindle* mechanism, *faradic* stimulation can be given to get contractions and improve the feeling of motion. The brain only recognizes motion, not muscle work so that stimulation is given to cause normal motion and to increase muscle strength¹⁰.

That ES can be used in chronic Bell's palsy because it can protect facial muscles from atrophy or fibrosis and improve function, especially in cases of complete paralysis. Also, found that the use of ES in chronic cases for 3 months can increase eyelid movement which can be associated with a reduction in eyelid stiffness¹¹.

Massage is a massage that is done to help speed up the recovery process of several kinds of diseases using touch and without inserting drugs into the body with the aim of alleviating and reducing complaints or symptoms in several kinds of diseases. The scope of *massage* includes manipulation techniques (activities with hands) on soft tissues. Giving *massage* to the skin is to



increase skin temperature, because of the mechanical effects caused by *massage*. This will increase the temperature and decrease the *resistance of the skin*, the effect of *massage* on the muscles and soft tissue is to keep the muscles in the best state of nutrition, *flexibility* and *vitality* so that after experiencing trauma or muscle disorders are still in maximum condition. *Massage* does not increase muscle mass, but will increase muscle tone¹².

Massage applications can be given since the onset of *Bell's palsy*. *Massage* can be started by giving *gentle strokes* and *effluerage*. For *effluerage* on the facial muscles, the pressure should not be too strong because the condition of the muscle fibers is smoother when compared to the *skeletal* muscles, further *massage* can be recommended giving *finger kneading*, the *massage* can be ended by giving *tappotement* in the form of *slapping* on the face of the lesion¹³.

The *massage* given by this treatment is to stimulate soft tissue using manual techniques to increase flexibility, stimulate tissue sensory receptors on the skin so that it provides a relaxing effect, and reduces facial spasm¹². According to¹⁴ it has a positive effect in increasing muscle function and relaxation to increase blood circulation, thereby reducing tension, anxiety and stress. Providing facial muscle exercises including *massage* is very effective, so that the weakness score will decrease and facial symmetry can be achieved.

Mirror exercise is a facial movement exercise that is done passively. The results of this mirror exercise can improve facial function as well as facial symmetry¹⁵. The exercise is done by contracting the facial muscles by looking in a mirror. Patients are asked to observe the patient's facial movements in front of a mirror with certain movements, then the patient will know the contractions of facial muscles that experience weakness¹⁶. Benefits Mirror exercise can be useful for preventing muscle atrophy and thereby improving muscle function¹⁵. Conditions that require the provision of mirror exercise, including facial muscles that experience stiffness and weakness so that expectations for achieving facial symmetry can be fulfilled.



Picture 2. Final result after therapy

Conclusion

Bell's palsy is an idiopathic paralysis that affects more than half of the lower facial muscles due to injury to the seventh cranial nerve, and the symptoms are facial muscle weakness or complete paralysis. G ejalanya vary in severity from one person to another, such as the



accumulation of food in one hand, difficulties with drinking, inability to raise eyebrows, headaches, high sensitivity to background noise, loss of taste sensation. The physiotherapy treatment given for this case is the provision of infrared, electrical stimulation with faradic currents, massage and mirror exercise. After being given the therapy, the complaints experienced by the patient began to decrease, which could be seen from the results of the Ugo fish examination and an increase in muscle strength which was evaluated using MMT.

References

1. Fanani, A. (2011). *Health Dictionary*. 5th printing. Yogyakarta: Citra Pustaka Yogyakarta.
2. Lowis H and Gaharu MN, 2012. Bell's palsy, Diagnosis and Management in Primary Care, Continuing Professional Education Development Article, Department of Neurology, Jakarta Medical Center
3. Abdullah, Hilman Hafiz Bin;. (2017). Characteristics of Bell's Palsy Patients At Dr. General Hospital. Wahidin Sudirohusodo in 2016. *Thesis; Hasanuddin University: Faculty of Medicine*, 1-63.
4. Salvo, SG (2013). *Mosby's Pathology for Massage Therapists*. 3rd Edition. Los Angeles: Elsevier Health Science.
5. Lumbantobing. (2012). *Clinical Neurology Physical and Mental Examination*. 15th edition. Jakarta: FKUI Publishing Agency.
6. Kim, J. (2016) 'Translational Correlation: Stroke', *Conn's Translational Neuroscience*, pp. 151–157. doi:10.1016/B978-0-12-802381-5.00012-9.
7. Tsai, SR, Hamblin, MR (2017). Biological effects and medical applications of infrared radiation. *J Photochem Photobiol B Biol*, 170(April):197-207.
8. Ng, Sun. Y., M. Chu. (2014). Treatment of bell's palsy using monochromatic infrared energy: A report of 2 cases. *J Chiropr Med*, 13(2): 96-103.
9. Sigh, J. (2012). *Textbook of Electrotherapy*. 2nd Edition. New Delhi: Jaypee Brothers Publishers.
10. Abdelatif, Emad Eldin Mohamed;. (2020). Effect of Transcutaneous Electrical Nerve Stimulation and Faradic Current Stimulation on the Recovery of Bell's Palsy. *International Journal of Human Movement and Sports Sciences*, 8 (6), 369-380.
11. Firas Sarhan, Ahmad Saif, Danah Saif. Bell's palsy: an overview. *British Journal of Neuroscience Nursing*, 2012; 8(4): 163-168 DOI: 10.12968/bjnn.2012.8.4.163. <https://doi.org/10.12968/bjnn.2012.8.4.163>
12. Prentice, William E. (2012). *Therapeutic Modalities in Rehabilitation*. MC Graw Hill, New York.
13. Abidin, Zainal; Akhmad Alfajri Amin; Didik Purnomo;. (2017). Effect of Infra Red and Massage on Bell's Palsy Dextra. *Journal of Physiotherapy and Rehabilitation (JFR)*, 1 (1), 41-48.
14. Shamsi, Sharick ;. (2015). Effect of Physiotherapy in the Management of Facial Palsy- Case Study. *International Journal of Health Sciences and Research*, 5 (1),408-412
15. Aranha, VP Samuel, AJ, & Narkeesh, K. (2017). Case Report Correct the smile of a child by neuromuscular facilitation technique : An interesting case report. *International Journal of Health Sciences*, April 2017, 11(2): 1-2.
16. Women. 2016. "Bell's Palsy Sinistra in RSUD Sragen". KTI. Surakarta: Muhammadiyah University of Surakarta.