# Lower Motor Neuron Facial Palsy Triggered by Podophyllum Resin: A Case Report of Facial Nerve Dysfunction Following Topical Application

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## ABSTRACT

This case report presents an 18-year-old male who developed left-sided facial weakness, tearing, and incomplete eyelid closure after applying podophyllum resin to a wart. Clinical examination confirmed Lower motor neuron facial palsy, with no systemic illness or abnormalities in hematological tests. The patient was treated with oral prednisolone, leading to a full recovery within 28 days. Podophyllum resin, a topical agent with neurotoxic potential, is rarely associated with facial nerve palsy. This case highlights the importance of considering external factors, such as neurotoxic agents, in the differential diagnosis of lower motor neuron facial palsy and emphasizes the need for further research into non-idiopathic causes.

**Keywords:** Lower motor neuron facial palsy; Neurotoxicity; Podophyllum resin

## INTRODUCTION

Lower motor neuron facial palsy also known as Bell's Palsy is an acute, idiopathic peripheral nerve palsy that involves the lower motor neurons. All of the facial expressive muscles are weak due to a lesion in the lower motor neurons. The facial nerve also contains parasympathetic fibers to the lacrimal and salivary glands, as well as limited sensory fibers supplying taste to the anterior two-thirds of the tongue. Bell's palsy is one of the most common neurological disorders which usually manifests with facial weakness, ear pain, taste disturbance, hyperacusis, and increased tearing.[1] The annual incidence of Bell's palsy is 15 to 30 per 100,000 persons, with equal numbers of men and women affected. The physical examination should include careful inspection of the ear canal, tympanic membrane, and oropharynx, as well as evaluation of peripheral nerve function in the extremities and palpation of the parotid gland. To assess forehead involvement, a physical examination should also include an evaluation of cranial nerve function, including all facial muscles. Laboratory testing is not usually indicated.[2]

Podophyllin is a resin mixture obtained from the dried rhizome and roots of Podophyllin peltatum (North America) and Podopyllinemodi (India). This resin contains at least 16 chemicals including podophyllotoxin, alpha and beta peltatin, desoxypodophyllotoxin, and quercetin. Of these, the toxic agent is thought to be podophyllotoxin, a lipid-soluble compound that crosses cell membranes with ease. This substance and its derivatives have a colchicine-like effect, arresting the mitotic spindle. Neurotoxicity may be related to its in vitro ability to bind microtubular protein and inhibit axoplasmic flow. Podophyllin has been used for external application in the treatment of anogenital warts, condyloma accuminatum, malignancy basal cell epitheliomas, wet and exudative types of eczema, and molluscum contagiosum. According to the Centers for Drug Control, podophyllum is no longer recommended as a treatment for external genital warts because of safer alternative options. Podophyllin poisoning following both topical application and oral consumption has been reported in adults.[3]

## CASE DESCRIPTION

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An 18-year-old Aryan male presented with a complaint of tearing in his left eye for three days and inability to completely close the upper eyelid of his left eye for two days. He had a wart in his chin for two years. Recently he had applied a topical podophyllum resin benzoin and aloes solution over a wart. On day 10 of using the solution, he noticed the accumulation of saliva in the left side of his mouth and he began to tear from his left eye, and on the 11th day, he noticed difficulty in closing his left eyelid. He denied fever, pain, sores, or blisters. On physical examination, left-sided physical weakness was seen involving both the upper and lower facial muscles. He had a facial asymmetry and difficulty in chewing food. He had no pain or any problems in regard to taste and hearing.

His visual acuity at distance was 6/6 in both eyes when assessed with Snellen's alphabet chart and near vision was N6 at 40cm in both eyes when assessed with a reduced Snellen's chart. On cover test examination, orthophoria was revealed at both distant and near. The duction and version ocular motility was painless, smooth, full, and extended in all gazes. The pupillary reaction was normal in both eyes. The patient was able to slightly raise his eyebrows, and incompletely close his eyes with a strong effort but the bells phenomenon in both eyes was intact. On slit lamp examination, cornea was found to be clear with no evidence of exposure keratitis. Fundus examinations revealed normal retinal findings. The color vision test was done using Ishihara pseudo-isochromatic chart (38-plate edition) which revealed red-green deficiency in both eyes with strong protanomaly. The central visual field examination using an automated visual field analyzer using SITA-Standard (24-2), the visual field was found to be normal in both eyes. The examination of the ear, nose, and throat (ENT) revealed no abnormalities. A diagnosis of Bell's palsy was made.

The patient had no previous history of any systemic illness. On the hematological examination, the random blood sugar was normal, and Thyroid function tests (TSH, T3 (triiodothyronine), and T4(thyroxine) ) were within normal range.

The patient received prednisolone 60mg orally for a week then the dose was tapered. He was examined closely and the condition improved. On 28th day patient completely recovered from Bell's palsy.

## DISCUSSION

Lower motor neuron facial palsy is the most common cause of unilateral facial paralysis, typically presenting with a sudden onset of facial muscle weakness. It predominantly affects individuals between the ages of 15 and 45, with symptoms often progressing over hours to days. In most cases, recovery begins within three weeks, and around 70-85% of patients experience full recovery following appropriate treatment.[4,5] This case report highlights a typical presentation of lower motor neuron facial palsy, characterized by facial asymmetry, tearing, and an inability to fully close the eyelid on the affected side. The patient received prednisolone therapy, the mainstay treatment for lower motor neuron facial palsy, and showed significant improvement within four weeks.

An interesting aspect of this case is the potential link between the use of podophyllum resin for a wart and the development of Bell's palsy. Podophyllum is known to have neurotoxic properties, which, when absorbed systemically, can potentially lead to nerve dysfunction.[5] While idiopathic causes are typically assumed in Bell's palsy cases, this report underscores the importance of considering external factors, such as topical agents, in the differential diagnosis of facial nerve palsy. In this case, the neurotoxic effects of podophyllum may have contributed to the patient's facial nerve paralysis.

Lower motor neuron facial palsy is generally believed to result from inflammation of the facial nerve at the geniculate ganglion, which leads to compression, ischemia, and demyelination.[2] Most cases do not require extensive diagnostic workups unless paralysis persists beyond six months or presents with atypical features. Prompt administration of corticosteroids has been shown to improve recovery rates, as demonstrated by the positive outcome in this case.[4,6] Continued research into external triggers, such as neurotoxic agents like podophyllum, could help clarify the etiology of non-idiopathic cases of lower motor

neuron facial palsy.

Additionally, distinguishing between lower motor neuron facial palsy and upper motor neuron lesions, such as those seen in strokes, is critical. Bell's palsy affects the lower motor neurons, causing weakness in all muscles of facial expression, including the frontalis muscle, resulting in drooping of the mouth and difficulty closing the eye. In contrast, upper motor neuron lesions, such as in stroke cases, typically spare the frontalis muscle, preserving normal furrowing of the brow and eye closure.[6] This distinction is important in clinical diagnosis and management.

## CONCLUSION

This case highlights a rare instance of lower motor neuron facial palsy potentially triggered by the neurotoxic effects of topical podophyllum resin. Full recovery was achieved with corticosteroid therapy, emphasizing the importance of considering external neurotoxic agents in the differential diagnosis of facial nerve dysfunction.

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