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Swallowing Recovery In Opercular Syndrome: The Role Of Automatic–Voluntary Dissociation During Speech-Language Pathology–Led Dysphagia Rehabilitation – A Case Report

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Abstract

Background: Opercular syndrome, also known as Foix–Chavany–Marie syndrome, is a rare neurological disorder characterized by automatic–voluntary dissociation, in which voluntary movements of the facial, lingual, pharyngeal, and masticatory muscles are severely impaired while involuntary and emotional movements remain relatively preserved. Dysphagia is a common and debilitating consequence, increasing the risk of aspiration, malnutrition, dehydration, and reduced quality of life. Speech-language pathology (SLP)-led dysphagia rehabilitation plays a crucial role in promoting functional swallowing recovery by utilizing preserved automatic motor pathways.

Case Presentation: This case report describes an adult patient diagnosed with opercular syndrome following bilateral opercular cortical involvement, presenting with severe dysphagia, anarthria, impaired voluntary oral motor control, and preserved automatic oral movements such as spontaneous smiling and yawning. Comprehensive swallowing assessment, including clinical bedside evaluation and instrumental findings, confirmed marked impairment in the oral and pharyngeal phases of swallowing with an increased risk of aspiration. An individualized SLP-led dysphagia rehabilitation program was implemented, emphasizing compensatory strategies, therapeutic swallowing exercises, sensory stimulation, effortful swallowing, thermal-tactile stimulation, postural modifications, and facilitation of automatic swallowing responses. Therapy also incorporated caregiver education and regular monitoring of nutritional and respiratory status.

Results: Progressive improvement in swallowing function was observed over the rehabilitation period. The patient demonstrated enhanced oral bolus control, improved initiation of the swallowing reflex, reduced aspiration episodes, and gradual advancement from modified-texture diets toward safer oral intake. Recovery appeared to be associated with the exploitation of preserved automatic motor pathways despite persistent impairment in voluntary oral motor control, highlighting the clinical significance of automatic–voluntary dissociation in rehabilitation planning.

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Conclusion: This case emphasizes the importance of early, individualized, and intensive speech-language pathology intervention for dysphagia management in opercular syndrome. Understanding the neurophysiological basis of automatic–voluntary dissociation enables clinicians to design targeted rehabilitation strategies that maximize functional swallowing recovery and improve patient safety, nutritional status, and overall quality of life. Further clinical studies are warranted to establish standardized rehabilitation protocols and optimize long-term outcomes for individuals with opercular syndrome.

1. INTRODUCTION

Opercular syndrome, also known as Foix–Chavany–Marie syndrome (FCMS), is a rare neurological disorder characterized by the loss of voluntary control over the muscles involved in facial expression, mastication, swallowing, speech, and tongue movement, while automatic and emotional movements remain relatively preserved. This distinctive phenomenon, known as automatic–voluntary dissociation, results from bilateral lesions affecting the anterior opercular regions of the frontal cortex, which interrupt corticobulbar pathways responsible for voluntary motor control. Patients with opercular syndrome may retain the ability to yawn, laugh, cry, or smile spontaneously despite being unable to perform the same movements voluntarily on command. This unique neurological presentation provides important insights into the organization of cortical motor pathways and has significant implications for rehabilitation.

Dysphagia is one of the most disabling manifestations of opercular syndrome and represents a major challenge in patient management. Swallowing is a highly coordinated neuromuscular process involving voluntary oral preparation followed by involuntary pharyngeal and esophageal phases. Damage to the cortical swallowing centers disrupts voluntary initiation of swallowing, leading to impaired bolus formation, delayed swallow reflex, aspiration, dehydration, malnutrition, prolonged hospitalization, and increased risk of aspiration pneumonia. Severe dysphagia also contributes to social isolation, psychological distress, and diminished quality of life, making effective rehabilitation an essential component of patient care.

Speech-language pathologists (SLPs) play a central role in the assessment, diagnosis, and rehabilitation of dysphagia in neurological disorders. Comprehensive dysphagia management includes bedside clinical evaluation, instrumental assessments such as videofluoroscopic swallow study (VFSS) or fiberoptic endoscopic evaluation of swallowing (FEES), individualized therapeutic exercises, compensatory swallowing strategies, sensory stimulation techniques, postural adjustments, dietary modifications, and caregiver education. In opercular syndrome, rehabilitation is particularly challenging because voluntary oral motor control is severely impaired. However, the preservation of automatic motor functions offers a unique therapeutic opportunity to facilitate swallowing recovery through alternative neural pathways.

The concept of automatic–voluntary dissociation has attracted considerable interest in neurorehabilitation because it demonstrates that automatic and voluntary motor functions are mediated by partially distinct neural circuits. Rehabilitation strategies that exploit preserved

automatic movements, such as reflexive swallowing, spontaneous saliva swallowing, emotional facial expressions, and sensory-triggered swallowing responses, may enhance functional recovery despite persistent cortical motor deficits. Recent advances in neuroplasticity research suggest that repetitive, task-specific swallowing exercises and sensory stimulation can promote cortical reorganization and strengthen compensatory neural networks, thereby improving swallowing efficiency and reducing aspiration risk.

Although several case reports have described the neurological characteristics of opercular syndrome, there remains limited literature focusing specifically on dysphagia rehabilitation guided by speech-language pathology and the therapeutic significance of automatic–voluntary dissociation. Given the rarity of the condition, evidence regarding optimal rehabilitation protocols and long-term swallowing outcomes remains scarce. Individual case reports therefore provide valuable clinical evidence that can guide rehabilitation planning and improve understanding of functional recovery mechanisms.

This case report presents the swallowing rehabilitation of a patient with opercular syndrome who exhibited profound dysphagia associated with automatic–voluntary dissociation. It highlights the role of an individualized speech-language pathology–led dysphagia rehabilitation program in facilitating swallowing recovery through targeted therapeutic interventions that capitalize on preserved automatic motor functions. The report aims to contribute to the growing body of evidence supporting neuroplasticity-based rehabilitation strategies for improving swallowing safety, nutritional status, and quality of life in patients with opercular syndrome.

2. ROLE OF AUTOMATIC–VOLUNTARY DISSOCIATION

Automatic–voluntary dissociation is the defining neurological characteristic of Opercular Syndrome (Foix–Chavany–Marie syndrome) and plays a pivotal role in both the diagnosis and rehabilitation of dysphagia. The phenomenon refers to the inability of a patient to perform voluntary movements of the facial, lingual, pharyngeal, and masticatory muscles on command, while automatic, emotional, and reflexive movements remain relatively intact. For example, patients may be unable to voluntarily protrude the tongue, smile, swallow, or speak when instructed, yet they can yawn, laugh, cry, cough, or swallow saliva spontaneously. This dissociation occurs because bilateral lesions in the anterior opercular cortex disrupt the corticobulbar pathways responsible for voluntary motor control, whereas alternative neural circuits involved in automatic and emotional motor functions remain functional.

In swallowing rehabilitation, automatic–voluntary dissociation provides an important therapeutic opportunity. Although voluntary initiation of swallowing is severely impaired, preserved automatic swallowing mechanisms can be activated through sensory and reflexive stimulation. Speech-language pathologists (SLPs) utilize this preserved neural capacity by incorporating evidence-based interventions such as thermal-tactile stimulation, sour or cold bolus stimulation, effortful swallowing exercises, repetitive swallowing practice, and carefully selected food textures. These approaches facilitate activation of involuntary swallowing

pathways and enhance the coordination of oral and pharyngeal muscles, thereby improving swallowing efficiency and reducing the risk of aspiration.

Automatic–voluntary dissociation also supports the concept of neuroplasticity, which is the brain's ability to reorganize and form new neural connections following injury. Repetitive, task-specific swallowing exercises stimulate intact neural networks and encourage compensatory cortical and subcortical mechanisms. Over time, these adaptations may partially restore functional swallowing despite persistent impairment of voluntary oral motor control. Consequently, rehabilitation should focus not only on compensating for deficits but also on strengthening preserved automatic motor pathways to maximize functional recovery.

The recognition of automatic–voluntary dissociation is equally important during clinical assessment. Observing spontaneous facial expressions, reflexive swallowing, emotional smiling, yawning, or coughing helps clinicians distinguish opercular syndrome from lower motor neuron disorders, peripheral cranial nerve lesions, and neuromuscular diseases. Accurate identification of this neurological sign enables appropriate diagnosis and guides the development of individualized rehabilitation strategies.

From a speech-language pathology perspective, automatic–voluntary dissociation emphasizes the importance of patient-centered, function-oriented therapy. Treatment should combine therapeutic swallowing exercises, compensatory techniques, postural adjustments, sensory enhancement, dietary modifications, caregiver education, and continuous monitoring of swallowing performance. Regular reassessment allows rehabilitation goals to be modified according to patient progress while minimizing complications such as aspiration pneumonia, malnutrition, and dehydration.

Overall, automatic–voluntary dissociation is not merely a diagnostic hallmark of opercular syndrome but also serves as the physiological foundation for effective dysphagia rehabilitation. By exploiting preserved automatic motor pathways, speech-language pathology–led interventions can significantly improve swallowing safety, nutritional status, and quality of life, demonstrating the critical role of neuroplasticity-based rehabilitation in managing this rare neurological disorder.

3. SPEECH-LANGUAGE PATHOLOGY–LED DYSPHAGIA REHABILITATION

Speech-language pathology (SLP)–led dysphagia rehabilitation is a fundamental component of the multidisciplinary management of patients with Opercular Syndrome (Foix–Chavany–Marie syndrome). Dysphagia resulting from bilateral opercular lesions significantly impairs the oral and pharyngeal phases of swallowing, increasing the risk of aspiration, malnutrition, dehydration, and respiratory complications. Because the disorder is characterized by automatic–voluntary dissociation, conventional rehabilitation approaches that rely solely on voluntary oral motor control may be less effective. Instead, speech-language pathologists develop individualized rehabilitation programs that capitalize on preserved automatic and reflexive swallowing mechanisms while promoting functional recovery through neuroplasticity.

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The rehabilitation process begins with a comprehensive swallowing assessment. Speech-language pathologists perform a detailed case history, cranial nerve examination, oral motor assessment, cognitive evaluation, and bedside clinical swallowing examination to determine the severity and nature of dysphagia. Instrumental assessments such as Videofluoroscopic Swallow Study (VFSS) or Fiberoptic Endoscopic Evaluation of Swallowing (FEES) are frequently used to visualize swallowing physiology, identify aspiration or penetration, evaluate bolus transit, and determine appropriate therapeutic interventions. These assessments provide objective information that guides treatment planning and helps monitor progress throughout rehabilitation.

Individualized swallowing therapy focuses on improving swallowing safety and efficiency while reducing aspiration risk. Therapeutic interventions commonly include thermal-tactile stimulation, which enhances sensory input and facilitates initiation of the swallowing reflex, particularly in patients with delayed swallow initiation. Effortful swallowing exercises strengthen pharyngeal muscle contraction and improve bolus clearance, while repetitive swallowing practice promotes motor learning and cortical reorganization. Sensory enhancement techniques, including cold, sour, or carbonated boluses, stimulate intact sensory pathways and activate preserved automatic swallowing responses. These interventions are especially valuable in opercular syndrome because involuntary swallowing pathways often remain functional despite impaired voluntary motor control.

Compensatory strategies form another essential aspect of rehabilitation. Speech-language pathologists recommend postural adjustments such as the chin-tuck maneuver, head rotation toward the weaker side, or head tilt when appropriate to improve airway protection and facilitate bolus flow. Dietary modifications, including altering food texture and liquid consistency according to standardized dysphagia diets, reduce the likelihood of aspiration while ensuring adequate nutrition and hydration. Patients may initially require pureed foods and thickened liquids before progressing to more regular consistencies as swallowing function improves. Safe feeding techniques, controlled bite sizes, slow feeding rates, and supervised oral intake further enhance swallowing safety.

Oral motor rehabilitation is tailored carefully because voluntary facial and lingual movements are often severely impaired in opercular syndrome. Instead of emphasizing isolated muscle strengthening alone, therapy focuses on functional swallowing tasks that utilize preserved automatic motor patterns. Repeated saliva swallowing, reflexive swallowing, and stimulation of spontaneous oral movements encourage activation of alternative neural pathways. Functional task-oriented therapy has been shown to promote greater neuroplastic adaptation than isolated non-functional exercises, making it particularly beneficial in neurological dysphagia.

Caregiver and family education are integral components of speech-language pathology–led rehabilitation. Caregivers are instructed in safe feeding techniques, appropriate patient positioning during meals, recognition of aspiration signs, oral hygiene practices, and adherence to prescribed dietary modifications. Education improves treatment compliance, reduces caregiver anxiety, and helps prevent complications such as aspiration pneumonia and

malnutrition. Regular communication between the speech-language pathologist, neurologist, dietitian, physiotherapist, occupational therapist, and nursing staff ensures coordinated multidisciplinary care and consistent rehabilitation goals.

Continuous monitoring and outcome evaluation are essential throughout rehabilitation. Swallowing function is reassessed periodically using standardized clinical scales and instrumental examinations to evaluate improvements in swallowing physiology, nutritional status, respiratory health, and functional oral intake. Rehabilitation plans are modified according to patient progress, ensuring that therapeutic interventions remain appropriate and effective. Even when complete restoration of voluntary oral motor function is not achievable, meaningful improvements in swallowing safety, oral intake, and quality of life can often be attained through individualized therapy.

4. DISCUSSION

Opercular syndrome (Foix–Chavany–Marie syndrome) is an uncommon neurological condition resulting from bilateral lesions of the anterior opercular cortex, leading to severe impairment of voluntary movements involving the face, tongue, pharynx, and masticatory muscles while preserving automatic and emotional motor functions. This phenomenon, known as automatic–voluntary dissociation, is the hallmark of the syndrome and has important implications for both diagnosis and rehabilitation. The present case highlights the effectiveness of speech-language pathology (SLP)-led dysphagia rehabilitation in improving swallowing function by utilizing preserved automatic motor pathways despite profound deficits in voluntary oral motor control.

Dysphagia is one of the most disabling manifestations of opercular syndrome because swallowing requires precise coordination between voluntary oral movements and involuntary pharyngeal and esophageal phases. Bilateral cortical damage disrupts corticobulbar pathways responsible for initiating voluntary swallowing, resulting in poor bolus preparation, delayed swallow initiation, reduced tongue mobility, impaired airway protection, and an increased risk of aspiration. Without appropriate intervention, these impairments can lead to aspiration pneumonia, dehydration, malnutrition, prolonged hospitalization, and reduced quality of life. Therefore, early identification and comprehensive dysphagia management are essential to minimize complications and improve functional outcomes.

One of the most significant findings of this case is the therapeutic importance of automatic–voluntary dissociation. Although the patient was unable to voluntarily perform oral motor tasks, spontaneous swallowing, yawning, coughing, and emotional facial expressions remained relatively preserved. These preserved automatic functions indicate that subcortical and brainstem swallowing pathways continue to function despite cortical motor impairment. Rehabilitation strategies that stimulate these intact neural pathways provide an opportunity to enhance swallowing performance through repetitive sensory and motor training. This observation supports previous neurological studies suggesting that voluntary and automatic motor functions are mediated by partially independent neural networks.

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The individualized SLP-led rehabilitation program focused on evidence-based dysphagia management strategies, including thermal-tactile stimulation, effortful swallowing, sensory enhancement, postural adjustments, dietary modifications, and repeated functional swallowing practice. These interventions were selected to facilitate swallowing initiation, improve oral bolus control, strengthen pharyngeal contraction, and reduce aspiration risk. Progressive improvements observed during rehabilitation demonstrate that structured swallowing therapy can effectively exploit preserved automatic motor mechanisms and promote safer oral intake even when voluntary oral motor recovery remains incomplete.

Neuroplasticity likely contributed to the functional improvements observed in this case. Repetitive, task-specific swallowing exercises stimulate adaptive reorganization of cortical and subcortical neural networks, allowing intact pathways to compensate for damaged corticobulbar circuits. Contemporary research indicates that intensive swallowing rehabilitation enhances motor relearning, improves neuromuscular coordination, and facilitates recovery of swallowing function following neurological injury. Although complete restoration of voluntary oral motor control may not always be achievable in opercular syndrome, meaningful improvements in swallowing safety and functional independence can be attained through consistent rehabilitation.

5. CLINICAL IMPLICATIONS

The findings of this case report highlight several important clinical implications for the assessment and rehabilitation of dysphagia in patients with Opercular Syndrome (Foix–Chavany–Marie syndrome). Since dysphagia is one of the most disabling manifestations of the disorder, early recognition and timely intervention are essential to prevent life-threatening complications such as aspiration pneumonia, malnutrition, dehydration, and prolonged hospitalization. Clinicians should maintain a high index of suspicion for opercular syndrome in patients who exhibit impaired voluntary facial and oral movements while preserving automatic functions such as spontaneous smiling, yawning, coughing, or swallowing.

Comprehensive swallowing assessment by a Speech-Language Pathologist (SLP) should be initiated as early as possible following diagnosis. Clinical bedside swallowing evaluation should be complemented with instrumental investigations such as Videofluoroscopic Swallow Study (VFSS) or Fiberoptic Endoscopic Evaluation of Swallowing (FEES) whenever feasible. These assessments provide detailed information regarding swallowing physiology, aspiration risk, bolus transit, and airway protection, allowing clinicians to develop individualized rehabilitation programs based on objective findings.

Recognition of automatic–voluntary dissociation has direct therapeutic significance. Instead of relying solely on voluntary oral motor exercises, rehabilitation should emphasize interventions that activate preserved automatic and reflexive swallowing pathways. Techniques such as thermal-tactile stimulation, sensory enhancement using cold or sour boluses, effortful swallowing, repetitive task-specific swallowing practice, and functional swallowing activities can facilitate safer swallowing and promote neuroplastic adaptation. These approaches may improve swallowing efficiency even when voluntary oral motor recovery remains limited.

Individualized treatment planning is essential because the severity of dysphagia and neurological impairment varies among patients. Rehabilitation programs should combine restorative exercises with compensatory strategies, including postural modifications, safe swallowing maneuvers, texture-modified diets, and controlled feeding techniques. Regular reassessment allows therapy to be adjusted according to the patient's progress, ensuring optimal functional outcomes while minimizing aspiration risk.

The case also emphasizes the critical role of multidisciplinary collaboration. Effective dysphagia management requires coordinated care involving neurologists, speech-language pathologists, dietitians, physiotherapists, occupational therapists, nurses, and caregivers. Dietitians help maintain adequate nutritional intake, while nursing staff monitor respiratory status and aspiration signs. Physiotherapists contribute to posture and respiratory function, and caregivers reinforce therapeutic strategies during daily feeding activities. Such coordinated care enhances treatment effectiveness and improves patient safety.

Caregiver education is another important clinical implication. Family members should receive training on safe feeding techniques, appropriate patient positioning, recognition of aspiration symptoms, oral hygiene practices, and adherence to prescribed dietary modifications. Educated caregivers can improve treatment compliance, reduce complications, and support continued rehabilitation outside the clinical setting.

From a rehabilitation perspective, this case reinforces the importance of neuroplasticity-based intervention. Repetitive, task-oriented swallowing exercises stimulate adaptive neural reorganization and encourage the development of compensatory pathways that support functional recovery. Early initiation of intensive swallowing therapy may maximize recovery potential and reduce long-term dependence on enteral feeding methods.

Finally, because opercular syndrome is a rare neurological disorder, standardized clinical guidelines for dysphagia rehabilitation remain limited. This case provides practical evidence supporting the effectiveness of SLP-led rehabilitation and highlights the need for multicenter clinical studies, standardized treatment protocols, and long-term outcome evaluations. Such research will strengthen evidence-based practice and contribute to improved clinical management, functional swallowing recovery, and quality of life for individuals affected by opercular syndrome.

6. CONCLUSION

Opercular syndrome is a rare but severe neurological disorder in which dysphagia significantly compromises patient safety, nutritional status, and overall quality of life. The presence of automatic–voluntary dissociation, characterized by impaired voluntary oral motor function despite preserved automatic movements, presents both a diagnostic hallmark and a unique opportunity for targeted rehabilitation. This case report demonstrates that individualized speech-language pathology (SLP)-led dysphagia rehabilitation can effectively improve swallowing function by utilizing preserved automatic motor pathways and evidence-based therapeutic interventions.

The structured rehabilitation program, including swallowing exercises, sensory stimulation, compensatory techniques, postural modifications, dietary adjustments, and caregiver education, resulted in gradual improvements in oral motor control, swallowing efficiency, and safe oral intake while reducing the risk of aspiration. The findings suggest that repetitive, task-specific therapy promotes neuroplasticity and functional recovery even in patients with profound cortical motor impairment. Early identification of dysphagia and timely intervention are therefore essential to prevent secondary complications such as aspiration pneumonia, malnutrition, dehydration, and prolonged hospitalization.

This case further highlights the indispensable role of speech-language pathologists within the multidisciplinary rehabilitation team in evaluating swallowing disorders, designing individualized treatment plans, monitoring patient progress, and facilitating long-term functional recovery. Understanding the neurophysiological basis of automatic–voluntary dissociation enables clinicians to develop innovative rehabilitation strategies that maximize the use of preserved neural mechanisms.

Although the rarity of opercular syndrome limits the availability of large-scale clinical evidence, this case contributes valuable insights into the management of dysphagia in this population. Future multicenter studies with larger patient cohorts and long-term follow-up are needed to establish standardized rehabilitation protocols, validate therapeutic outcomes, and further explore neuroplasticity-based interventions for optimizing swallowing recovery and enhancing the quality of life of individuals affected by opercular syndrome.

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