

Research on Advances in Early Rehabilitation Intervention for Dysphagia

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Abstract: Dysphagia is a common clinical symptom caused by various factors, significantly affecting patients' quality of life and prognosis. This paper aims to review recent advancements in early rehabilitation intervention for dysphagia, covering the significance of early rehabilitation, standards for functional assessment of dysphagia, timing for early rehabilitation training, psychological care, and rehabilitation training methods. The importance and latest research findings on early rehabilitation intervention for dysphagia are comprehensively discussed to provide a reference for clinical practice.

Keywords: Dysphagia; Early rehabilitation intervention; Psychological care; Rehabilitation training methods

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1. Introduction

Swallowing is a fundamental physiological function essential for human nutrition intake. However, many diseases, such as stroke, head and neck tumors, and neurodegenerative disorders, can lead to dysphagia. According to relevant data, the prevalence of dysphagia in stroke patients is approximately 50%–80%. If swallowing dysfunction occurs post-stroke, it significantly increases the risk of infections from various pathogens, malnutrition, pulmonary complications, and even death, often resulting in poor prognosis for patients^[1]. Rehabilitation training, as a form of therapeutic intervention, primarily aims to improve patients' motor functions by employing scientifically sound training methods to gradually enhance strength and flexibility, thus laying a solid foundation for recovery and helping patients return to normal life^[2]. Dysphagia not only exposes patients to risks like malnutrition and dehydration but also can lead to severe complications such as aspiration pneumonia, significantly increasing mortality and disability rates. Therefore, early rehabilitation intervention for dysphagia patients is crucial, as it can effectively improve swallowing function, enhance quality of life, reduce the incidence of complications, and promote overall patient recovery.

2. Significance of early rehabilitation intervention and standards for dysphagia functional assessment

2.1. Significance of early rehabilitation intervention

Symptoms associated with cerebral infarction are among the most common in cerebrovascular diseases. Statistics indicate that during the acute phase of cerebral infarction, the incidence rate can reach as high as 51%, with dysphagia having a significant impact on treatment outcomes throughout the patient's therapeutic process ^[3]. In their research, Wang ^[4] highlighted that it is essential to give adequate attention to cerebral infarction patients experiencing dysphagia. Implementing early rehabilitation training can effectively improve the swallowing function of these patients, helping them reduce the severity of their swallowing difficulties within a short time frame, potentially even achieving near-optimal recovery. This approach is effective because, in the early stages of dysphagia, while swallowing function is compromised, the nervous system retains a degree of plasticity. Early rehabilitation intervention leverages this plasticity through repeated stimulation and training to promote neural pathway reconstruction and functional recovery. Additionally, it can prevent complications from dysphagia, such as malnutrition, dehydration, and aspiration pneumonia, thus alleviating patient discomfort, reducing hospital stays, lowering medical costs, and improving satisfaction levels for both patients and their families.

2.2. Standards for dysphagia functional assessment

Accurately assessing the functional status of dysphagia patients forms the basis for designing a suitable rehabilitation plan. Currently, common clinical methods for assessing dysphagia function include:

- (1) Kubota Drinking Test: This test is simple and accessible. By observing patients as they drink water, including the time taken and any instances of choking, swallowing ability can be classified into different levels, providing a preliminary evaluation of the patient's swallowing function.
- (2) Videofluoroscopic Swallowing Study (VFSS): VFSS enables dynamic observation of structural and functional changes in areas such as the oral cavity, pharynx, and esophagus during swallowing, offering detailed insights into the specific location and mechanisms of dysphagia, thus providing precise guidance for rehabilitation training.
- (3) Fiberoptic Endoscopic Evaluation of Swallowing (FEES): FEES directly visualizes the mucosal surfaces of the pharynx and upper esophagus, evaluating pharyngeal sensation, motor function, and food residue during swallowing, making it valuable for detecting subtle swallowing difficulties.
- (4) Fujishima's 7-Point Dysphagia Scale: This scale integrates dysphagia symptoms with appropriate rehabilitation interventions, simplifying the assessment process and enabling precise, dynamic guidance on the patient's recovery progress in managing dysphagia ^[5].

3. Timing of early rehabilitation training intervention

Typically, as long as the patient's vital signs are stable, consciousness is clear, and the condition permits, rehabilitation training should be initiated as early as possible. For stroke patients, if there are no obvious contraindications such as severe cardiopulmonary insufficiency or coma, simple rehabilitation measures like oral muscle training can generally begin within 24–48 hours after onset. Research and practice on rehabilitation training suggest that the earlier rehabilitation training starts, the better the outcomes ^[6]. The first 24 hours post-

onset are regarded as the optimal time for combining active and passive functional training. Cai *et al.* [7] also found that systematic early rehabilitation training for cerebral infarction patients yields the best therapeutic results when swallowing treatment is initiated within 24 hours, given stable vital signs. Evaluation through the Kubota Drinking Test showed that the rehabilitation training group achieved significantly better outcomes than the control group (88% vs. 64%), not only reducing the degree of neurological impairment but also improving patients' quality of life and swallowing function [8]. These findings underscore the importance of determining the optimal timing for early rehabilitation training in dysphagia patients. However, the timing of early rehabilitation training cannot be universally applied and must account for individual differences. Some patients can start mild swallowing function training within a few days post-surgery, while those with more extensive surgical trauma and slower recovery may need to wait longer. Nevertheless, to maximize the nervous system's plasticity window, rehabilitation training should ideally begin within 1–2 weeks post-surgery.

4. Psychological care

Due to the difficulties associated with eating, dysphagia patients often experience anxiety, depression, and other negative emotions that hinder the rehabilitation process [3]. Stroke patients with dysphagia, in particular, may face various degrees of psychological disorders, further affecting mental health. Therefore, psychological interventions during rehabilitation training are essential [9]. Sun *et al.* [10] reported that combining rehabilitation nursing with psychological care for stroke patients with dysphagia can alleviate negative emotions, improve swallowing function, enhance quality of life, reduce psychological stress, and relieve negative feelings, thereby positively impacting mental health levels [11]. Additionally, studies indicate that 25%–73% of cerebral infarction patients develop negative emotions due to concerns about treatment outcomes, affecting their resilience [12]. Zhang [13] emphasized that timely adjustment of adverse psychological states and consistent psychological care facilitate rapid psychological recovery. Zhong *et al.* [14] advocated for strengthened communication between medical staff and patients, breaking down psychological misconceptions, encouraging patients to face their conditions positively, and fostering an optimistic outlook on life.

5. Rehabilitation training methods

5.1. Oral motor training

Oral motor training forms the fundamental basis for dysphagia rehabilitation, encompassing several targeted exercises. Localized exercises serve various functions: lip closure training involves guiding patients to repeatedly press and pucker their lips, enhancing lip muscle strength and closure capability to prevent food leakage; buccal muscle exercises, such as cheek puffing and sucking, help improve contraction and relaxation abilities, facilitating food manipulation within the oral cavity; and tongue exercises, like tongue protrusion, strengthen tongue muscles to aid in moving food to the pharynx. Overall, oral motor training focuses on stimulating the throat, pharyngeal, and oral muscles to prevent muscle atrophy and reduce the rehabilitation time for swallowing function. Repetitive swallowing and glottal closure exercises promote damaged nerve cell repair and central nervous system reorganization, accelerating swallowing recovery. Tongue exercises can also stimulate respiratory muscles, enhance pharyngeal pressure, improve coordination, and reduce complications [15]. Guo *et al.* [16] found that combining this training with psychological counseling benefits stroke patients

with swallowing dysfunction by improving swallowing function, nutritional status, and emotional well-being, thereby enhancing treatment effectiveness. Repeated training inputs into the brain facilitate the formation of new synaptic connections, improving central neuron plasticity, restoring motor reflexes, accelerating functional recovery, and ultimately enhancing swallowing ability^[17,18]. Zhu *et al.*^[11] reported that specialist nurse-led positive psychological interventions combined with oral motor training reduced anxiety and depression, improved swallowing function and nutritional indicators, and enhanced quality of life.

5.2. Swallowing function training

Swallowing function training improves microstructure and promotes motor cortex reconstruction through active and passive exercises of the lips and tongue muscles. Optimizing training methods and controlling training duration can also enhance patient compliance, supporting recovery^[19]. Zhang^[20] suggests pre-training mouth cleaning and honey massages for the mouth, tongue, and mucosa. Wang *et al.*^[21] recommend oral exercises such as opening and relaxing the mouth and moving the jaw from side to side, increasing speed gradually. Shao's^[22] research demonstrates that combining the Roy Adaptation Model with swallowing function training for elderly ACI patients with dysphagia can improve psychological and nutritional status, self-care abilities, and patient satisfaction. Xia *et al.*^[23] advocate for phonetic exercises, encouraging patients to produce monosyllabic sounds related to swallowing, thus promoting lip and associated muscle movement and closure functions.

5.3. Feeding training

Feeding training plays a critical role in improving swallowing function. By stimulating sensory and motor nerves associated with swallowing, this training enhances reflex flexibility, improves muscle coordination, and strengthens muscle power, effectively enhancing overall swallowing ability^[24]. Ensuring patient safety and training effectiveness is essential in feeding training, with quiet environments supporting relaxed nasal breathing, focus, and minimized aspiration risks^[25]. Moreover, guiding patients to focus on their eating helps them gauge appropriate speed and portion sizes, reducing dependency on others^[26]. Research supports these methods, as evidenced by Li *et al.*'s study^[27], which confirmed that direct feeding training combined with acupuncture and swallowing hydrogels significantly improves post-stroke swallowing function, enhancing quality of life. This approach effectively stimulates swallowing reflexes and improves patients' swallowing abilities.

5.4. Other rehabilitation training methods

In addition to the above methods, other suitable rehabilitation training approaches are chosen based on individual patient needs. Comprehensive, targeted training can improve the function of lips, jaw, tongue, airway closure, throat movement, and sensory input, thus holistically enhancing patients' feeding and swallowing capabilities.

- (1) Neck relaxation exercises: In addition to slow, routine head nodding, incorporate circular neck rotations—five times clockwise and counterclockwise, stretching muscles. Perform five repetitions per set for three sets, then pause to allow full neck relaxation.
- (2) Lip exercises: Instruct the patient to press their lips together while saying “en,” holding for five seconds and repeating ten times, then repeat with a smile. Similarly, say “wu,” extending the lips while pronouncing, and repeat five times. For lip resistance exercises, use a tongue depressor, tightly

close for eight seconds, then release; perform ten repetitions per set for three sets, gradually increasing resistance.

- (3) Jaw, facial, and cheek exercises: Move the jaw in each direction, holding for five seconds, repeating ten times, and pausing at the end range for three seconds. Puff the cheeks, apply finger resistance, and hold for five repetitions. Use a tongue depressor to stretch the affected cheek, adjusting strength as needed for 10 seconds per set, three sets total.
- (4) Tongue and soft palate exercises: After tongue protrusion exercises, add resistance movements to the tongue depressor, repeating five times. Lip-licking, with increased speed, should be completed within 10 seconds for three rounds.
- (5) Vocal fold closure and laryngeal elevation exercises: Instruct the patient to produce an “ah” sound, gradually raising the pitch and pausing to feel the vocal fold closure. Hold for three seconds, repeat ten times. For extended sounds, hold the “ah” for over five seconds, engaging the larynx, and repeat five times.
- (6) Breathing training: Beyond bubble and whistleblowing, add paper strip blowing exercises, placing a strip by the mouth and maintaining steady airflow to keep it suspended for 10 seconds, repeating five times.
- (7) Mendelsohn maneuver training: The therapist begins by gently massaging the neck and jaw, gradually increasing pressure. During swallowing, slight resistance is applied below the throat as appropriate, repeating five swallows per set for three sets.
- (8) Dry swallowing exercises: Encourage the patient to swallow as frequently as possible within a minute, aiming for 15 swallows initially, recording the count and progressively increasing the target.
- (9) Ice stimulation: Use an ice cotton swab to brush areas such as the back of the tongue, brushing each area for 15–20 seconds while monitoring reactions. Use moderate pressure and complete 2–3 rounds with rest intervals.

6. Conclusion and outlook

Early rehabilitation intervention for dysphagia is a multifaceted, comprehensive process involving the significance and evaluation criteria for early rehabilitation intervention, timing of intervention, psychological care, and various rehabilitation training methods. Accurate assessment of a patient’s swallowing function, timely intervention, enhanced psychological support, and the application of scientifically based rehabilitation methods, with adjustments to training intensity and frequency according to the patient’s condition, are crucial for improving swallowing function, enhancing the quality of life, and reducing complication rates. As medical research continues to advance, it is expected that future innovations in early rehabilitation interventions for dysphagia will provide more recovery prospects for patients.

Disclosure statement

The author declares no conflict of interest.

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