
Study Protocol

Official Title:

Research on the Effectiveness of Remote Rehabilitation for Shoulder and Neck
Recovery in Oral Cancer Patients After Selective Neck Dissection

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Experimental Protocol

I. Research Title

Research on the Effectiveness of Remote Rehabilitation for Shoulder and Neck Recovery in Oral Cancer Patients After Selective Neck Dissection

II. Research Background

The incidence of head and neck malignant tumors is high and shows a gradually increasing trend. Surgery is the most common and effective treatment for advanced oral squamous cell carcinoma (AOSCC). Consequently, AOSCC surgery typically consists of two parts: resection of the primary tumor and neck lymph node dissection. Traditional radical neck dissection involves the removal of the accessory nerve, the primary nerve innervating the trapezius muscle, leading to "shoulder syndrome." Symptoms include shoulder droop, pain, stiffness, atrophy and paralysis of the trapezius and sternocleidomastoid muscles, and even "winged scapula," causing significant physiological and psychological distress to patients.

Early and timely postoperative functional exercise can improve shoulder joint function. Traditional rehabilitation guidance is often delivered verbally, coupled with generally poor follow-up effectiveness, resulting in patients' inability to receive timely and effective rehabilitation exercise. Post-neck dissection shoulder function exercise is crucial for improving patients' shoulder function and quality of life. Studies have shown that these exercises can alleviate postoperative shoulder pain, increase shoulder range of motion, and enhance shoulder muscle strength.

Previously, the postoperative functional exercise guidance provided to patients was conducted via health manuals and discharge instructions. Due to geographical disparities and individual patient factors, patients often failed to adequately complete the rehabilitation training, limiting the rehabilitation outcomes. Therefore, this study utilizes an "Internet +" telerehabilitation approach to conduct rehabilitation training for patients.

III. Research Objective

This study aims to evaluate the improvement of shoulder and neck function in postoperative oral cancer patients through the application of an "Internet +" telerehabilitation guidance model.

IV. Research Content and Procedures

Patients were randomly assigned to either an experimental group or a control group using a random number table method. All patients underwent oral tumor resection combined with neck lymph node dissection (with accessory nerve preservation). The experimental group consisted of 30 patients, and the control group consisted of 31 patients.

Upon admission, patients underwent baseline assessments of shoulder and neck function. Postoperatively, all patients received standardized shoulder rehabilitation guidance (explaining potential shoulder dysfunction, rehabilitation exercise timing, and methods to patients and their families). Both groups followed the same rehabilitation exercise protocol, including:

1. Neck and Shoulder Recovery Training (24 hours postop to drain removal): Fist clenching and elbow flexion activities.
2. Neck and Shoulder Motor Function Rehabilitation (Post-discharge after suture removal to 3 months):
 - Month 1: Shoulder elevation, shrugging, arm pendulum exercises, combing hair, brushing teeth, dressing, face washing, wall climbing exercise, gentle neck movements. Frequency: 4 sets/day, 8–10 repetitions/set.
 - Months 2–3: Increased range of motion for shoulder and neck, including shoulder forward flexion, abduction, wall push-ups, resisted abduction training, etc., and neck rotation exercises. Frequency: 4–5 sets/day, 10 repetitions/set.
3. Muscle Strength Enhancement Training: Included increased resistance training. Post-discharge, based on patient condition, practicing lifting objects (hold 20–30 seconds, 10 repetitions/set, 4–5 sets/day).

Patient shoulder and neck function were assessed and recorded preoperatively using the Constant-Murley Score (CMS) and Neck Dissection Impairment Index (NDII). The CMS was used to evaluate shoulder function, including pain level, range of motion, muscle strength, and daily activities. The NDII was specifically used to assess neck function and quality of life.

Assessment Protocol

Patients received routine admission examinations and surgical treatment. At discharge:

- Control Group: received conventional discharge shoulder rehabilitation guidance and watched a shoulder rehabilitation instruction video.
- Experimental Group: in addition to conventional discharge guidance, was enrolled in an "Internet +" telemedicine guidance collaboration group. Patients or family members were instructed to download a specific smart hospital application. This involved bi-weekly visual/video conference rehabilitation guidance sessions. The smart hospital software also required patients to record and upload a video of their rehabilitation exercises every two weeks, using the app to check in based on completion.

Follow-up assessments for both groups were conducted at 1 week, 1 month, and 3 months post-discharge. The differences in scores from the Constant-Murley Shoulder Score (CMS) and Neck Dissection Impairment Index (NDII) at these time points were compared between the two groups.
