



Effect of physiotherapy on pain associated with accessory nerve injury after thyroidectomy. Case report

Atuação da fisioterapia na dor associada à lesão do nervo acessório pós-tireoidectomia. Relato de caso

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ABSTRACT

BACKGROUND AND OBJECTIVES: Thyroid cancer is the most common cancer of the endocrine system. Depending on the histological type and size, total thyroidectomy with resection of recurrent lymph nodes is the most indicated intervention. In this type of surgical modality, the accessory nerve can be injured, resulting in paralysis of the trapezius muscle and consequently dropped shoulder syndrome, characterized mainly by local and radiating pain. This study reports the impact of the physiotherapeutic approach on pain associated with accessory nerve injury in a patient who underwent thyroidectomy.

CASE REPORT: A 37-year-old female patient, diagnosed with papillary thyroid carcinoma and cervical lymph node metastasis after a physical therapy assessment, underwent total thyroidectomy and neck dissection and, as a consequence to the procedure, had a lesion of the accessory nerve. She underwent physiotherapy to treat pain, increase range of motion and strength in the shoulder homolateral to the surgery. The physiotherapy treatment consisted of myofascial release, stretching and progressive resistance exercises, joint mobility and functional bandaging. The patient showed improvement in pain, range of motion and strength in the affected shoulder.

CONCLUSION: The combined application of stretching, progressive mobility and resistance exercises, myofascial release and application of functional taping proved to be a treatment that brought good results for the patient.

KEYWORDS: Accessory nerve diseases, Case Report, Head and neck neoplasms, Pain, Physical therapy modalities.

RESUMO

JUSTIFICATIVA E OBJETIVOS: O câncer de tireoide é o mais comum do sistema endócrino. A depender do tipo histológico e do tamanho, a tireoidectomia total com ressecção dos linfonodos recorrentiais é a intervenção mais indicada. Neste tipo de modalidade cirúrgica, o nervo acessório pode ser lesionado, tendo como sequela a paralisia do músculo trapézio e por consequência a síndrome do ombro caído, caracterizada sobretudo por dor local e irradiada. Este estudo relatou o impacto da abordagem fisioterapêutica na dor associada à lesão do nervo acessório em paciente submetida à tireoidectomia.

RELATO DO CASO: Paciente do sexo feminino, 37 anos, diagnosticada a partir de avaliação fisioterapêutica com carcinoma papilífero de tireoide e metástase linfonodal cervical, foi submetida à tireoidectomia total e esvaziamento cervical e, como sequela do procedimento, apresentou lesão do nervo acessório. A paciente foi submetida à abordagem fisioterapêutica para tratamento da dor, aumento da amplitude de movimento e da força no ombro homolateral à cirurgia. O tratamento fisioterapêutico foi composto por liberação miofascial, exercícios de alongamento e resistência progressiva, mobilidade articular e aplicação de bandagem funcional. A paciente apresentou melhora na dor, amplitude de movimento e força no ombro acometido.

CONCLUSÃO: A aplicação combinada de alongamentos, exercícios de mobilidade e resistência progressiva, liberação miofascial e aplicação de bandagem funcional mostrou-se como um tratamento que trouxe bons resultados para a paciente.

DESCRIPTORES: Doenças do nervo acessório, Dor, Modalidades de fisioterapia, Neoplasias de cabeça e pescoço, Relato de caso.

HIGHLIGHTS

- The role of physiotherapy in the treatment of pain associated with accessory nerve injury
- The association between pain, accessory nerve damage and thyroidectomy
- Pain dysfunctions associated with spinal nerve damage

INTRODUCTION

Thyroid cancer is the most common malignant neoplasm of the endocrine system and, according to US projections, will rank fourth among the most frequent neoplasms by 2030^{1,2}. The main treatment for thyroid cancer is surgery. Depending on the histological type and size of the lesion, a total thyroidectomy associated with resection of recurrent lymph nodes is the most indicated intervention³. The involvement of regional lymph nodes is one of the most important prognostic indicators and is the preferred site for tumor metastasis. Therefore, neck dissection is the most used surgical procedure, whether radical or modified. In the radical case, in addition to the removal of lymphatic tissue from the neck, it can include the sternocleidomastoid muscle (SCM), the internal jugular vein and the accessory nerve^{3,4}.

The accessory nerve is a frequently manipulated structure and can be damaged during surgery, resulting in paralysis of the trapezius muscle. As a result, the patient experiences pain, limited shoulder movement, deformity in the anatomical position of the scapula and adhesive capsulitis. These alterations together are called dropped shoulder syndrome^{4,5}. Physiotherapy related to oncology has increased its role as cancer treatments advance and patient survival increases^{5,6}. Therefore, the present study brings a report on the use of physiotherapeutic interventions in a patient with dropped shoulder syndrome following accessory nerve damage in thyroidectomy surgery with neck dissection.

CASE REPORT

A 37-year-old female patient diagnosed with papillary thyroid carcinoma and cervical lymph node metastasis, with no family history of thyroid diseases, underwent total thyroidectomy and modified radical neck dissection to the right, presenting loss of strength and pain in the right upper limb (RUL) after surgery, without having undergone any therapeutic intervention to treat the clinical complaints mentioned.

Clinical findings

After surgery, the patient had muscle weakness and significant pain in the RUL. She was then referred to for a physiotherapy assessment and received a functional kinesiological diagnosis of dropped shoulder syndrome.

Timeline

The patient underwent surgery in October 2018 and subsequently underwent 30 sessions of radiotherapy with iodine (200mCi). She began physiotherapy treatment on August 16, 2021, in the Oncology Physiotherapy Scientific Initiation Project at the Estácio do Recife University Center.

Diagnostic assessment

In the physiotherapeutic assessment, through inspection and palpation, the following was observed: a longitudinal scar on the right and a transverse scar on the circumference of the neck, without adherence, depression of the right shoulder with internal rotation, head and neck with a marked inclination to the left, hypotrophy of the upper bundle of the trapezius muscle, tendons of the SCM and levator scapulae muscles tensed and clearly edematous.

Local sensitivity was assessed using a stoniometer. Hypoesthesia was detected in the area around the scar. In the functional assessment, the patient presented muscle weakness, decreased range of motion (ROM), posterior protrusion of the scapula, progressive functional loss and significant pain in the RUL, with pain score of 8 on the visual analog scale (VAS). According to these results and those obtained from the Shoulder Pain and Disability Index (SPADI-Brazil), the final functional kinesiological diagnosis dropped slumped shoulder syndrome⁶.

Therapeutic intervention

The treatment consisted of stretching and mobility exercises for the shoulder girdle and thoracic area using a stick; strength exercises for the rotator cuff muscles, initially using elastic bands, then progressing to 1 kg dumbbells as the patient adapted to the effort; strength exercises for the rhomboid major, minor and deltoid muscles, initially using elastic bands, then gradually progressing to 1 kg and 2 kg dumbbells; exercises for the serratus anterior with 1 kg dumbbells; myofascial release in the entire posterior area of the trunk, emphasizing the muscles with scapular insertion and in the cervical region, the SCM and the levator scapulae; and application of functional bandaging.

The sessions were held twice a week, for 1 hour, for 5 months, from August to December 2021, with a break in January 2022 and a return for another 5 months, from February to June 2022.

Follow-up and outcomes

Table 1 shows the results of the assessments carried out at the beginning and end of treatment. Muscle strength was estimated using the Kendal test; ROM was measured using goniometry; pain and functionality were measured using the VAS and the Shoulder Pain and Disability Index (SPADI-Brazil).

Table 1. Evaluation results at the beginning and end of treatment.

Assessed Parameters	Aug/2021	Jun/2022
Flexion Strength RUL	3	5
Extension Strength RUL	4	5
Abduction Strength RUL	3	4
Flexion ROM RUL	70°	166°
Extension ROM RUL	22°	45°
Abduction ROM RUL	70°	140°

RUL: right upper limb; ROM: decreased range of motion. Source: Prepared by the authors.

Satisfactory progress was seen in the increase in strength and ROM in flexion, extension and abduction of the right upper limb, as well as a significant reduction in shoulder pain and disability according to the VAS and SPADI-Brazil scales.

DISCUSSION

Dropped shoulder syndrome is a debilitating and painful condition that is highly prevalent in head and neck cancer surgeries. It results from damage to the accessory nerve, which can occur during neck dissection, even when the nerve remains preserved⁶⁻⁸.

The accessory nerve is the main motor supply for the trapezius muscle and its impairment causes a reduction in muscle strength, resulting in depression, abduction and medial rotation of the scapula, as well as a reduction in the range of shoulder flexion and abduction⁸.

In addition, most patients require adjuvant radiotherapy on the lateral aspect of the neck. The radiation field includes both the accessory nerve and the trapezius muscle. Radiotherapy causes fibrosis of the muscle fibers and the neural sheath, as well as nerve demyelination⁸.

This report discusses physiotherapy treatment for slumped shoulder syndrome following thyroidectomy with neck dissection and radiotherapy. Studies show that the duration of treatment should be at least one year and that associated procedures are more effective⁹.

In this case, the combined application of stretching, mobility exercises, progressive resistance exercises, myofascial release and functional bandaging over a period of 1 year eliminated pain in the short and long term, improved ROM and muscle strength and allowed the patient to return to her activities of daily living (ADLs) efficiently^{5,10,11}.

Recent studies show that exercise after adjuvant therapy results in significant improvements in the functional capacity of the upper limb. A supervised aerobic and resistance exercise intervention designed to improve metabolic syndrome also led to significant improvement in functional upper extremity mobility, including active ROM, strength and perceived limitations for ADLs¹².

It is possible that one of the causes of improvement in shoulder function and pain was also achieved through compensation by other muscles that had their fibers recruited in the training, such as major and minor rhomboid, deltoid, anterior serratus and rotator cuff muscles. Progressive resistance training is effective in improving shoulder pain and dysfunction^{5,13}.

Myofascial release is one of the main techniques used to control the limiting pain that affects the performance of ADLs and is an important resource in the rehabilitation process as it provides physiological movement, has an analgesic effect and increases the local pressure pain thresholds^{14,15}.

Myofascial release techniques, stretching and muscle strengthening have shown benefits in improving the alignment of the thoracic area, the functionality of the shoulder girdle and the sensation of pain in breast cancer survivors. The techniques suggested can also be applied to patients with head and neck cancer, since the areas of intervention are identical^{15,16}.

Functional bandaging is a therapeutic elastic bandage used to treat sports injuries. Its application has benefits in reducing shoulder subluxation, in upper limb motor function and in performing ADLs in patients with hemiplegic shoulder pain. In patients with scapular depression syndrome, it increased the height of the scapula by mechanical correction and, in those patients with inferior rotation of the scapula, it reduced this rotation and shoulder pain¹⁷⁻¹⁹.

In the present study, the bandage improved shoulder alignment, making it easier to function and reducing the feeling of constant pain. It was applied with the first anchor in the proximal part of the arm, at the insertion of the muscles surrounding the shoulder, the tail divided into two parts, one involving the posterior surface of the glenohumeral joint, and the other the anterior surface of the same joint, with 30% to 40% tension, so that the two met and formed the second anchor, posterior to the acromion, giving support and stability to the involved muscles, especially the levator scapulae and SCM, without restricting any joint movement.

CONCLUSION

Accessory nerve damage, with pain and paralysis of the trapezius, is a condition that can occur after thyroidectomy and/or neck dissection. In this sense, physiotherapeutic treatment is an essential resource in the patient's recovery.

Based on this case report's findings, the combined application of stretching, mobility and progressive resistance exercises, myofascial release and functional bandaging is indicated as a treatment that brings good results for the patient.

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AUTHORS' CONTRIBUTIONS

Alexandre Lima Castelo-Branco: Conceptualization, Project Management, Research, Methodology, Writing - Preparation of the Original, Writing - Review and Editing, Supervision
Janaína Souza Tabatchnik: Data Collection, Research, Methodology, Writing - Preparation of the Original