Dysphagia Due to Non-Hodgkin's Lymphoma after Radiation: A Case Report of Rehabilitation Management

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Abstract: A 63 years old female was consulted to Dysphagia Clinic in Medical Rehabilitation Department six months after 20 times radiation with total dose 40Gy due to Non-Hodgkin's Lymphoma (NHL). She complained about difficulty in swallowing, dry saliva, and inadequate coughing. First Flexible Endoscopic Evaluation of Swallowing (FEES) indicated that she had oropharyngeal neurogenic dysphagia with risk of post swallowing aspiration and Functional Oral Intake Scale (FOIS) was 1 with tube dependent without oral intake. She got 12 times Neuromuscular Electrical Stimulation (NMES) in suprahyoid and infrahyoid muscle for 60 minutes and biofeedback 2times/week, breathing and oromotor exercises, Mendelsohn maneuver, Masako and Shaker Exercise. After 2 months of intensive rehabilitation, the second FEES showed a progression that patient might swallow semi-solid food with repeated swallowing, FOIS was 2 with tube dependent with minimal oral intake and after 5 months continued with oromotor and swallowing exercises FOIS was 3 with tube supplements with consistent oral intake. QoL was assessed with M.D. Anderson Dysphagia Questionnaire, result was improving from 53,68 to 70. Comprehensive rehabilitation management for dysphagia due to HNC after radiation can improve swallowing function, safety oral intake, and enhance QoL

1 INTRODUCTION

Dysphagia is a common symptom of head and neck cancer (HNC), including Non-Hodgkin's Lymphoma (NHL), as well as representing a complication of its treatment, chemoradiation. The use of radiotherapy with or without chemotherapy for treatment of HNC as a primary treatment modality has increased significantly over the past twenty years. Despite preservation of the structures of the head and neck, swallow function is not maintained at normal levels after treatment (Hutscheson, 2012). Aspiration rates among HNC patients is estimated to be 36%–94% have been reported in the literature after treatment with primary chemoradiotherapy while the incidence of silent aspiration due to a decrease in the cough reflex is 22%–67% (Kweon, 2018).

Fibrosis of the irradiated tissue of the head and neck results in impaired movement of the oral tongue, tongue base, pharyngeal constrictors, and larynx, leading to dysfunction. Due to mucositis, edema of the soft tissues, copious mucous production, xerostomia, and tissue swelling, patients begin to develop acute dysphagia. These complications begin to show from 4 to 5 weeks after radiation-based therapy and persist through the first-year posttreatment and may be present many years after completion of radiotherapy (Pauloski, 2008; King, 2016). Later, fibrosis, neuromuscular dysfunction, muscles atrophy, lymphedema, and damage to neural structures occur, leading to the late effects of dysphagia (Hutscheson, 2012; Kweon, 2018).

Radiation-induced dysphagia is responsible for a change in the type of diet and a prolongation of the mealtimes, which participate in anorexia, malnutrition, and decreasing quality of life (QoL) (Kweon, 2018; Pauloski, 2008).

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2 CASE DESCRIPTION

A 63 years old female was consulted to Dysphagia Clinic in Medical Rehabilitation Department after six months after 20 times radiation with total dose 40Gy due to NHL. Radiation is carried out in the neck region according to figure 1. She got Nasogastric Tube for nutrition intake and tracheostomy due to history of airway obstruction cause of tumor enlargement. She complained about difficulty in swallowing, dry saliva, mucositis and inadequate coughing. She experienced weight loss despite being consulted for nutritional intake via NGT.

First Flexible Endoscopic Evaluation of Swallowing (FEES) indicated that she had oropharyngeal neurogenic dysphagia with risk of post swallowing aspiration. The results showed that she had delayed of laryngeal elevation, swallowing reflex was decreasing, retroflexion of epiglottic was delayed and cough reflex was inadequate. Her Functional Oral Intake Scale (FOIS) was 1 with tube dependent without oral intake. She got 12 times Neuromuscular Electrical Stimulation (NMES) in suprahyoid and infrahyoid muscle for 60 minutes and surface EMG (sEMG) biofeedback 2 times a week, breathing and oromotor exercises, Mendelsohn maneuver, Masako and Shaker Exercise (Figure 2 and 3). The exercises were given for home exercise and evaluated with biofeedback at hospital.

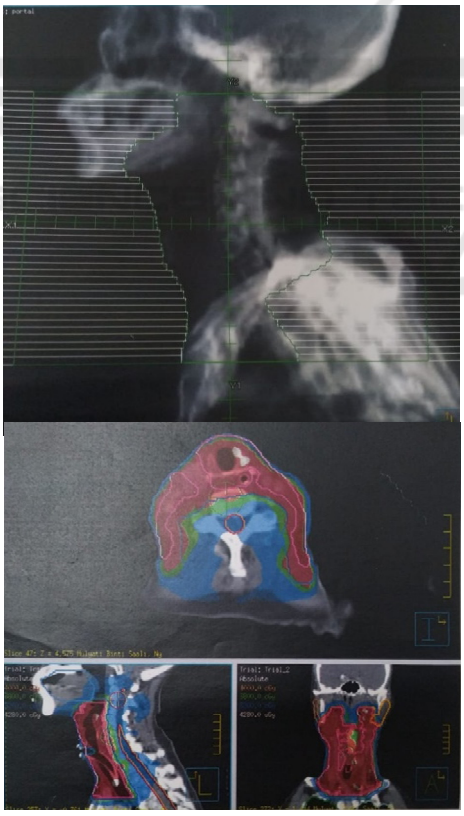

Figure 1: Patient's radiation area

After 2 months of intensive rehabilitation, the second FEES showed a progression that patient might swallow semi-solid food with repeated swallowing, FOIS was 2 with tube dependent with minimal oral intake. Oromotor exercises that include ROM exercises, Mendelsohn maneuver, Masako and Shaker exercises was continues until the 5th month. Follow-up was done every month. After almost seven months of rehabilitation, FEES showed an improving that patient could swallow solid-food and liquid with repeated swallowing without penetration and aspiration, also cough reflex was adequate. FOIS was 3 with tube supplements with consistent oral intake. Figure 4 shows the progression of the FOIS results. QoL was assessed with M.D. Anderson Dysphagia Questionnaire, result was improving from 53,68 to 70. Now, the patient still in rehabilitation program to improve her swallowing with target total oral intake.

Figure 2: Application of Neuromuscular Electrical Stimulation and Biofeedback therapy of the patient

Figure 3: Oromotor Exercises and Masako Exercises of the patient

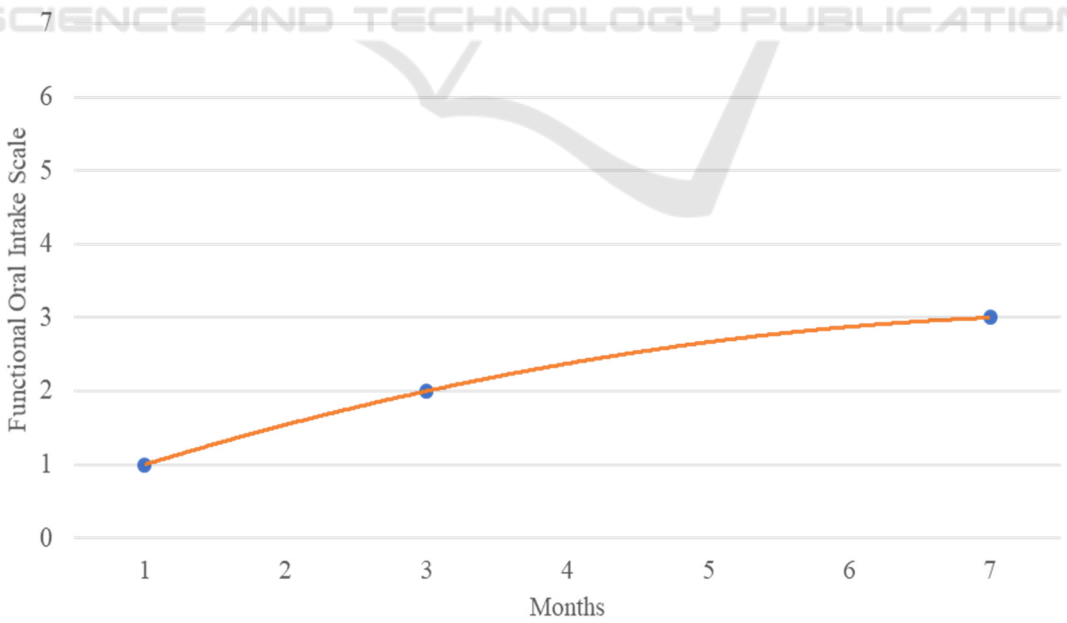

Figure 4: Progression of Functional Oral Intake Scale of the Patient

3 DISCUSSION

Patients with cancer of the head and neck may be treated with surgery, radiotherapy, chemotherapy, or a combination. Each treatment modality may have a negative impact on post-treatment swallowing function, especially in this case report dysphagia occurred after treated by radiation. Rehabilitative management available to reduce or eliminate swallowing disorder in patients treated for cancer of the head and neck, which include postures, maneuvers, exercises, and modalities such as NMES and sEMG biofeedback to help patient achieve optimal function, improve swallowing function, safety oral intake, and enhance QoL (Pauloski, 2008).

In this patient, radiation dose was 40 Gy which may affect fibrotic in irradiated structures results in limited mobility of the oral tongue, tongue base, pharynx and larynx. Besides that, radiation also damage the salivary glands results in significantly reduced salivary flow. Patient also felt dry in saliva. Studies of saliva flow after radiation showed that reduce the dose with below 24 to 26 Gy made saliva flow is persevered and will increase toward pretreatment levels over the first year. Glands receiving a mean dose higher than the threshold will produce little saliva with no recovery over time. Reduced saliva weight does not correlate with slowed or inefficient swallow. Instead, reduced saliva weight seems to change the patient's perception of swallowing ability and, on that basis, affects diet choices (Logemann, 2001).

Oromotor exercises that include range of motor (ROM) exercise, postures, and maneuvers were given to the patient. The normal range of motion of the lips, jaw, tongue, and larynx is often disrupted after treatment for cancer of the head and neck, as a result of fibrosis induced by radiation. ROM exercises are designed to improve the movement by extending the target structure in a desired direction until a strong stretch is felt. Range of motion exercises can be used for the lips, jaw, oral tongue, tongue base, larynx, and hyoid-related musculature to improve movement. Tongue range of motion exercises for the oral tongue include extension, lateralization, elevation, and retraction (Pauloski, 2008).

Mendelsohn maneuver is one of maneuver that we give to the patient. This maneuver is a voluntary prolongation of laryngeal excursion at the midpoint of the swallow, intended to increase the extent and duration of laryngeal elevation and thereby increase the duration of cricopharyngeal opening. Since the first FEES showed that patient had delayed of laryngeal elevation, we choosed Mendelsohn maneuver which research has indicated that it is effective at increasing the extent and duration of laryngeal elevation as well as duration of cricopharyngeal opening. Mendelsohn maneuver may be practiced with or without a bolus as dictated for safety and as an exercise (Pauloski,2008).

The Masako exercise or tongue-hold exercise is an oro-pharyngeal exercise rehabilitation technique to enhance the function of the constrictor pharyngeal superior. This technique is mainly performed to strengthen its function of pushing food boluses from the oral cavity to the pharynx by strengthening the contact between the tongue base and the laryngo-pharyngeal wall. Patient holds the tongue forward between the teeth while swallowing. Its intent is to improve movement and strength of the posterior pharyngeal wall during the swallow (Logemann, 2008; Byeon, 2016).

Another exercise that we were given to the patient is Shaker Exercise. Suprahyoid muscle group responsible for displacement of the hyolaryngeal complex and opening of the Upper Esophageal Spinchter (UES) appears responsive to external influences, like a simple isometric/isokinetic head lift exercise. For this exercise, patient was instructed to raise the head high and forward enough to be able to see their toes without raising shoulders off the ground. The rationale for the exercise is to build strength in the suprahyoid musculature, thus enhancing hyoid and laryngeal (Pauloski 2008).

sEMG Biofeedback was used to the patient twice a week for evaluate the exercise. Biofeedback was used during swallow attempts and oromotor exercise to assist the patient in maintaining the requested duration of each swallow attempt and to providing progressively more challenging targets based on strength. Electrodes were placed on the on the submental muscles (mylohyoid, geniohyoid, anterior belly of digastric, genioglossus) and a third reference electrode was placed to one side of zygomaticus. The sEMG signal represents the timing and force of the muscle contraction and is displayed graphically on a screen. An ascending threshold approach was employed in which the patient was required to progressively increase swallow effort and strength to obtain a visual feedback (Benfield, 2008; Crary, 2004).

Surface neuromuscular electrical stimulation (NMES) has recently been proposed as a treatment option for pharyngeal dysphagia. Surface electrical stimulation is applied through electrodes placed on the neck with the goal of promoting increased hyoid

or laryngeal elevation. NMES for dysphagia has become a widely utilized clinical procedure yet is accompanied by considerable controversy because of a lack of physiologic rationale and limited published efficacy data (Pauloski,2008).

Study from Ryu et al evaluated the effect of NMES in patient suffering from dysphagia following treatment for head and neck cancer with procedure 30 minutes of NMES, 5 days a week for 2 weeks combined with traditional swallowing therapy. This study showed that NMES combined with traditional swallowing training is superior to traditional swallowing training alone in patients suffering from dysphagia following treatment for head and neck cancer (Ryu, 2009). Meanwhile, another study from Langmore et al that did a randomize controlled trial of 170 patients with active NMES and swallow exercises versus sham NMES and swallow exercises group showed that after 12 weeks program, NMES did not add benefit to traditional swallow exercises (Langmore, 2016). Although the results of existing studies showed inconsistent results, NMES combined with oromotor and swallowing exercises seems provide benefits to the patients with progressing Functional Oral Intake Scale (FOIS) and increasing the QoL from M.D. Anderson Dysphagia Questionnaire result. Now, the patient still in rehabilitation program to improve her swallowing function with target safety total oral intake with adequate nutrition. Patient may still need modification of diet and swallowing maneuver.

In conclusion, comprehensive rehabilitation management for dysphagia due to HNC after radiation can improve swallowing function, safety oral intake, and enhance QoL.

REFERENCES

Hutscheson KA, Lewin JS, Barringer DA, Lisec A, Gunn B, Moore MWS, et al. 2012. Late Dysphagia after Radiotherapy-Based Treatment of Head and Neck Cancer. Cancer, 118(23), pp.5793-9.

Kweon S, Koo BS, Jee S. 2018. Change of Swallowing in Patients with Head and Neck Cancer After Concurrent Chemoradiotherapy. Ann Rehabil Med, 40(6), pp.1100-7.

Pauloski BR. 2008. Rehabilitation of Dysphagia Following Head and Neck Cancer. Phys Med Rehabil Clin N Am, 19(4), pp.889–928.

King SN, Dunlap NE, Tennant PA, Pitts T. 2016. Pathophysiology of Radiation-Induced Dysphagia in Head and Neck Cancer. Dysphagia, 31(3), pp.339–51.

Logemann JA, Smith CH, Pauloski BR, et al. 2001. Effects of xerostomia on perception and performance of swallow function. Head Neck, 23(4), pp.317–21.

Logemann JA. 2008. Treatment of Oral and Pharyngeal Dysphagia. Phys Med Rehabil Clin N Am, 19, pp.803–16.

Byeon H. 2016. Effect of the Masako maneuver and neuromuscular electrical stimulation on the improvement of swallowing function in patients with dysphagia caused by stroke. J. Phys. Ther. Sci, 28, pp.2069–71.

Benfield JK, Everton LF, Bath PM, England TJ. 2008. Does Therapy With Biofeedback Improve Swallowing in Adults With Dysphagia? A Systematic Review and Meta-Analysis. Archives of Physical Medicine and Rehabilitation, 100(3), pp.551-61.

Crary MA, Carnaby GD, Groher ME, Helseth E. 2004. Functional Benefits of Dysphagia Therapy Using Adjunctive sEMG Biofeedback. Dysphagia, 19, pp.160–4.

Ryu JS, Kang JY, Park JY, Nam SY, Choi SH, Roh JL, et al. 2009. The effect of electrical stimulation therapy on dysphagia following treatment for head and neck cancer. Oral Oncology, 45, pp.665-8.

Langmore SE, McCulloch TM, Krisciunas GP, Lazzarus CL, Daele DJV, Pauloski BR, et al. 2016. Efficacy of Electrical Stimulation and Exercise for Dysphagia in Head and Neck Cancer Patients: A Randomized Clinical Trial. Head Neck, 38 (1), pp.1221-31.