The use of Electrochemotherapy as neoadjuvant treatment for Head and Neck Cancer

Eugenia Allegra, MD, PhD; Rossana Domanico, MD
University “Magna Graecia” of Catanzaro, Italy – Mater Domini Hospital, Catanzaro, Italy

ABSTRACT

Background. Electrochemotherapy (ECT) is a new therapeutic method that is used in oncology to facilitate the adhesion into the tumor cell of poorly permeant drugs that have high intrinsic toxicity. A locally applied electric field modifies the membrane permeability allowing intracellular accumulation of the chemotherapeutic agent.

Materials and Methods. Prospective study. Twelve patients with head and neck cancer treated with ECT and bleomycin at the ENT Department of Catanzaro from January to December 2013 were recruited. The primary end point of the study was to verify the tumor debulking after ECT treatment as neoadjuvant, before conventional chemoradiotherapy. For each patient clinical-anamnestic data were collected and the local tumor control, survival, and effects on quality of life (Health Survey Questionnaire, SF-36 (v1), and pain control (Analgiesia Post-Surgery, APS scale) were evaluated. The treatments were performed by Cliniporator® IGEA according to the European Standard Operating Procedures of Electrochemotherapy (ESOP 2006). Response to ECT treatment was evaluated after 30 days. All patients received postoperative chemoradiotherapy.

Results. Local control and impact on quality of life were evaluated. Six of 12 lesions exhibited a partial response, 4 of 12 a complete response, and in two cases disease progression was observed.

Conclusions. ECT represents a safe and effective therapeutic approach, that is associated with clear benefits in terms of quality of life (minimal discomfort, mild post–treatment pain and short duration of hospital stay).

METHODS AND MATERIALS

At the Division of Otolaryngology, University Magna Graecia of Catanzaro (Italy), were recruited from January to December 2013 twelve patients with head and neck cancer; the patients (eight males, six females, aged 47–65 years) were treated with electrochemotherapy and latocerecral lymph node functional dissection, as they are not candidates for radical surgery or who refused it because of demoltion aesthetic and functional outcomes.

The selection of patients was done according to the following criteria: life expectancy of more than three months, lesion size suitable for the application of electrical pulses, no treatment in the preceding two weeks, good performance status (Karnofsky index greater than 70%), and appropriate renal function and blood indices.

Before ECT treatment, all patients were subjected to ENT examination and oncologic and radiologic evaluation with CT/MRI to measure the maximum diameter of the lesion to be treated and to complete the staging process.

The patients completed the health survey questionnaire SF-36 (v1) before and after ECT treatment. All lesions were documented by photos and videos for evaluation of the treatment results in terms of reduction in the local extension of the disease.

The ECT treatment was done under general anesthesia to reduce the pain and muscle spasms induced by the technique. Immediately after anesthesia induction, all patients received an intravenous bolus of 15,000 IU/m² of bleomycin, Eight minutes after the infusion, the electrical impulses generated by the Cliniporator™ IGEA Ltd, Carpi, Modena, Italy) were sent to the tumoral lesions with the use of various types of electrodes (flat, hexagonal, or finger), which were chosen according to the site, volume, and shape of the lesions to be treated. The pulses were completed within 30 minutes after injection of the chemotherapeutic drug.

The evaluation of the responses was conducted after 4 weeks, all patients were clinically observed and documented with photos (Photo 1) and they were classified depending on the response according to RECIST criteria.

Post-operative pain was assessed in all patients using the Analgesia Post-Surgery (APS) card, which included both the Visual Analog Scale (VAS) and the Verbal Rating Scale (VRS).

At the end of the four weeks, all patients were subjected to chemoradiotherapy.

CONCLUSIONS

The treatment of head and neck cancer that has spread or is relapsing can be difficult for the surgeon and debilitating for patients, especially when important anatomic structures are involved. In recent years, ECT has been proposed as a new therapeutic method for the control of neoplastic subcutaneous or mucosal lesions of the skin. The literature contains a few data about the efficacy of this procedure in the treatment of head and neck cancer, and the objective response rates seem promising, ranging from 50% to 100%. Our data seem to be comparable with those reported in the literature; in fact, we found an objective response rate of 75%.

In the literature, the efficacy of ECT has been reported to be influenced only by the size of the tumor and not by the histologic nature of the lesions. ECT is still considered as a palliative treatment that should be reserved for patients in advanced stages of disease; however, some authors have emphasized the role of ECT not only as a palliative treatment but as a curative and neoadjuvant therapy, especially in case of limited lesions. Many potential benefits are associated with the use of ECT, including tissue preservation, short hospitalization, reoperability, and low cost.

We chose to treat our patients under general anesthesia, as have other authors, because the muscular spasms induced by the electrical impulses can be very painful and psychologically traumatic if the patients are not pharmacologically paralyzed.

However, the technique needs to undergo improvements, in particular regarding the technical devices used. In fact, the areas actually treated are limited. The depth and manageability of the electrodes need to be improved because the areas treated include crevices in anatomic regions. Most of the cases reported in the literature concern injuries that are easy treatable with currently available devices. The requirements for oral, pharyngeal, or intranasal localization necessitate using other forms of electrodes, in particular for endoscopic application.

REFERENCES