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Case Report

Emergency Radiotherapy for Airway Obstruction Caused by Palatine Tonsil B-cell Non- Hodgkin Lymphoma: A Case Report

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Abstract:

Diffuse Large B-cell lymphoma (DLBCL) is the most common type of non-Hodgkin lymphoma in adults. It appears in an aggressive form, and it is characterized by a rapid growth of B lymphocytes and their accumulation in the lymphonodes or other organs (liver, spleen, etc.). Due to its aggressive nature, the prognosis may be poor, particularly in patients who have already been heavily pretreated or in those with refractory and relapsed disease.

We present the case of a patient with non-Hodgkin large B cell lymphoma of the right palatine tonsil, which came to our observation in urgency for severe refractory dysphagia due to Chemotherapy.

Key words: tonsil lymphomas; chemotherapy r-cvp, "salvage radiotherapy"

Introduction

The head and neck region is the second most common site of extranodal lymphoma, with the tonsils being the most frequently involved location; other sites include the nasopharynx and the base of the tongue. Diffuse large B-cell lymphoma is the most common histological subtype. [8]. These lymphomas predominantly occur in elderly males and present with tonsillar swelling, cervical lymphadenopathy, dysphagia, odynophagia, or sore throat.[3,9]

Radiotherapy also plays a crucial role in symptom control, particularly in emergency settings involving upper airway obstruction, where it can provide rapid tumor shrinkage and relieve critical symptoms. This is especially relevant in bulky disease or when rapid clinical deterioration precludes timely initiation of systemic therapy.[1]

We report the case of a patient diagnosed with diffuse large B-cell lymphoma of the tonsil, exhibiting resistance to chemotherapy treatment. This report highlights the complexities in treating refractory diffuse large B-cell lymphoma of the tonsil and calls attention to the necessity for alternative therapeutic options.

Presentation

An 84-year-old patient, severely obese (approximately 110kg) in a wheelchair, suffering from type 2 diabetes and chronic renal failure. In April 2024, due to the onset of odynophagia, for which he had undertaken an antibiotic therapy with beta lactams, on the advice of the healer, even with little result, he made an ear, nose and throat (ENT) visit that showed voluminous swelling of the right tonsil, which occupied the hypopharyngeal lumen for about 80% pushing up to near the glottic planus.

Biopsy was performed. Histological examination confirmed: large B-cell spread non- Hodgkin lymphoma. Positive immunophenotype for CD20, BDL6 and MUM1; negative for CD10. CD30e CD 3. Proliferative index ki67>95%.

A total body Computerized Tomography examination (CT) revealed an important increase in the size of the right tonsils, which assumed a size of 3 cm in diameter, projecting into the oropharynx with a clear reduction of the respiratory tracts.

The Positron emission tomography-18 fluorodeoxyglucose (PET-18FDG) confirmed the presence of hyperaccumulation of radio drug in the right palatine tonsils with Standardized Uptake Value (SUVmax) 23 in addition to the presence of laterolcervical lymphadenopathy and supraclavicular lymphadenopathies with Standardized Uptake Value (SUV) between 17 and 30.

After undergoing a hematological oncological examination, the patient started R-CVP protocol treatment (Rituximab, Cyclophosphamide, Vincristine, Prednisone) that has been suspended after three cycles for reduction of platelets and for worsening dysphagia.

Then, it was re-evaluated with Computerized Tomography examination (CT) and Positron emission tomography (PET) which this time showed a

further increase of the palatine tonsil, compared to the previous examinations, which turned out to have a diameter of 4 cm.

The fluorodeoxyglucose positron emission tomography (FDG PET) compared to the previous examination showed a further increase in uptake at the level of the tonsils loggia with Standardized Uptake Value (SUVmax) 27, while the laterocervical lymphadenopathies were no longer present.

In view of the instrumental tests performed, we were called for an urgent Oncological Radiotherapy evaluation.

On December 19th, 2024, the patient came for the first visit to our facility. The objective examination showed significant dysphagia for solids and for liquids, the tonsils loggia was occupied by heterologous tissue, although as far as possible laterocervical lymphadenopathy was not palpatory. CT scans were performed with thermoplastic mask construction.

The CT scan was performed from the top of the skull to the pulmonary bases with a thickness of 2 mm and subsequent contouring by image fusion with PET and definition of the target volume with irregular morphology and close to organ at risk (OARs).

After discussing the case collectively, it was decided to deliver a therapeutic dose (TD) of 46 Gy(figure.1). With conventional fractionation, by Volumetric Modulated Arc Therapy (VMAT) technique.

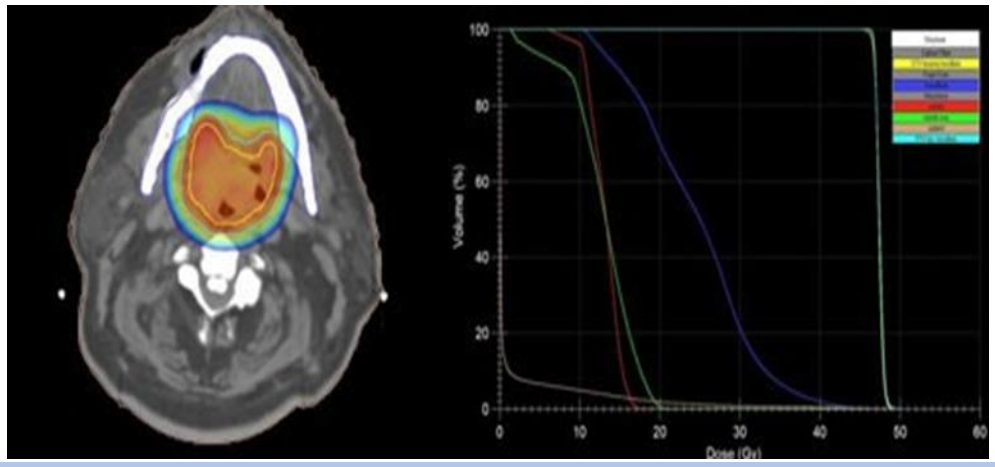

Figure 1: "Axial image from the simulation CT scan showing delineated target volumes (GTV, CTV, PTV) with isodose lines from the Radiotherapy treatment plan.

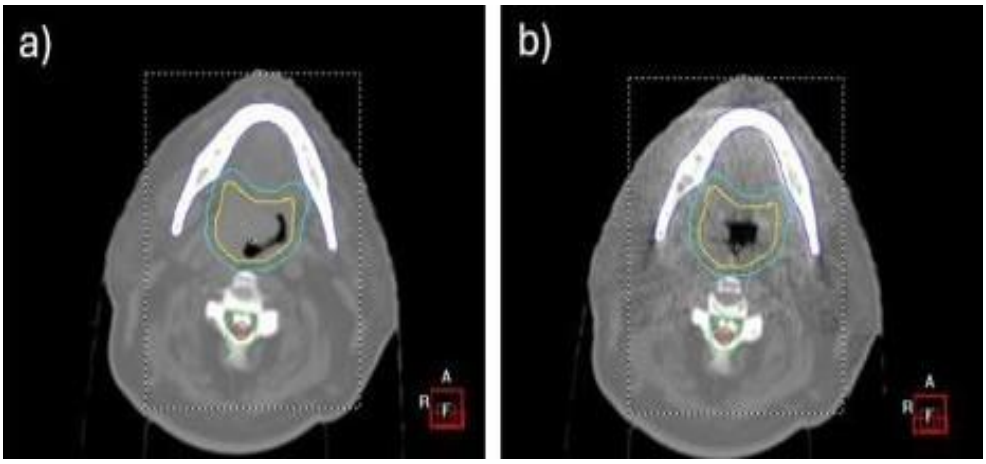

Figure 2: Target volume before treatment (a) and after delivery of 12 Gy (b), acquired through Cone Beam CT imaging.

Discussion

Primary tonsillar lymphoma accounts for less than 1% of the malignant neoplasms of the head and neck, although the tonsils are the most common primary extranodal site. Most patients have a localized disease (stage I/II). [2]

Chemotherapy, according to the regimen cyclophosphamide, vincristine and prednisone (CVP) and cyclophosphamide, doxorubicin, vincristine and prednisone (CHOP), followed by Consolidation radiotherapy, are the most commonly used regimens in the treatment of lymphoma. [4] The clinical case in question presented a refractory to chemotherapy treatment, which made it necessary to radiotherapy intervention in emergencies. [6]

Recent evidence supports the role of radiotherapy in improving both progression-free survival (PFS) and overall survival (OS), particularly in early-stage extranodal presentations. In a multicenter retrospective study, patients with stage I–II tonsillar

DLBCL treated with R-CHOP followed by involved-field radiotherapy showed significantly higher 5-year PFS and OS compared to those receiving chemotherapy alone (PFS ~75%, OS ~84%; HR for death with RT: 0.228, $p < 0.001$) [1,4,5]

Additionally, a SEER database analysis of 1,214 patients with tonsillar DLBCL demonstrated that radiotherapy was associated with improved OS in both pre- and post- rituximab eras [2]. These findings support the integration of radiotherapy into standard care, even in the era of monoclonal antibody-based chemotherapy [7]

Thanks to scientific progress, radiotherapy treatment has become more and more a personalized treatment that has allowed a better capacity of conformation of the dose to the target volume simultaneously with a high saving of healthy tissues, allowing, at the same radiotoxicity, the administration of higher doses of radiation to the target (dose escalation).

A significant advancement in radiotherapy dose delivery is volumetric modulated arc therapy (VMAT) which optimizes intensity modulation for precision targeting. During treatment with this technique, the patient's position is controlled by acquiring 3D cone beam computerized tomography (CBCT) radiological images of the patient during treatment to correct any deviations from the baseline position (Image Guided Radiation Therapy), on which the dose distribution was calculated.

The Cone Beam TC was daily performed before each delivery and at therapeutic dose (TD) of 12 Gy (figure.2), it was possible to objectively appreciate the clear reduction of lymphoproliferative tissue with the improvement of dysphagia. The patient tolerated the treatment well, and at the end of it, the hypopharyngeal lumen appeared completely free of neoplasia.

Mild mucositis was observed as a side effect. The re-evaluation CAT, performed 45 days after the end of the Radiant treatment, detected complete disappearance of lymphoproliferative tissue in the tonsils. A follow-up PET scan was scheduled for four months post-radiotherapy.

Conclusion

Salvage radiotherapy represents a valuable therapeutic option in the management of relapsed or refractory B-cell non-Hodgkin lymphoma of the tonsils, particularly in patients with localized disease. It offers the potential for long-term local control and symptom relief, especially in cases where systemic therapy has failed or is not feasible.

Advances in imaging and radiotherapy techniques, have improved targeting accuracy, allowing for effective treatment while minimizing toxicity to surrounding healthy tissues. Although radiotherapy alone may not be curative in all cases, its role as part of a multimodal salvage strategy—including chemotherapy and/or immunotherapy—should be carefully considered. Further prospective studies are needed to better define the optimal indications, doses, and outcomes of salvage radiotherapy in this specific patient population.

Radiotherapy, in the specific clinical case, has been shown to be effective on the disease in terms of reduction and of consequent reactions of clinical symptomatology.

We are waiting for the PET-CT examination that will better define the benefit of radiotherapy in terms of disease remission. A close clinical and instrumental follow- up will be followed to verify any radio-induced toxicity and possible recovery of disease.

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