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Appraisal of Changes in Tumor Size After Systemic Therapy for Oligoprogressive Gastric Mucosa-Associated Lymphoid Tissue (MALT) Lymphoma

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Abstract

Objective: The concept of oligoprogressive disease has introduced increasing interest in individualized treatment approaches that combine systemic therapy with local treatment modalities. However, treatment-related tumor regression and its potential impact on subsequent local treatment planning remain insufficiently described in gastric mucosa-associated lymphoid tissue (MALT) lymphoma. This study aimed to evaluate changes in tumor size after systemic therapy in patients with oligoprogressive gastric MALT lymphoma.

Materials and methods: Patients with oligoprogressive gastric MALT lymphoma who had available radiologic and endoscopic evaluations before and after systemic therapy were retrospectively reviewed. Tumor measurements were obtained from imaging assessments performed before treatment initiation and after completion of systemic therapy. Changes in lesion size, gastric wall involvement, and disease extent were comparatively evaluated using the findings.

Results: Patients with oligoprogressive gastric MALT lymphoma were included in the analysis, and all patients completed the planned systemic treatment course. Comparative assessment of pre-treatment and post-treatment findings demonstrated measurable reductions in tumor burden in most patients following therapy. Tumor regression was observed both at the primary gastric site and at evaluable sites of progressive disease involvement.

Conclusion: Systemic therapy was associated with measurable reductions in tumor size in patients with oligoprogressive gastric MALT lymphoma. These post-treatment anatomical changes may influence subsequent treatment planning and support consideration of individualized and adaptive treatment strategies. Prospective studies are needed to further clarify optimal treatment sequencing and the clinical relevance of treatment-related anatomical changes in this patient population.

Keywords: Gastric MALT Lymphoma; Oligoprogressive Disease; Systemic Therapy; Radiotherapy; Renal Cell

Abbreviations: SBRT: Stereotactic Body Radiotherapy; MALT: Mucosa-Associated Lymphoid Tissue; RCC: Renal Cell Carcinoma; IGRT: Image-Guided Radiotherapy; IMRT: Intensity-Modulated Radiotherapy; VMAT: Volumetric Modulated Arc Therapy; CT: Computed Tomography; MRI: Magnetic Resonance Imaging; PET/CT: Positron Emission Tomography/Computed Tomography

Introduction

Gastric mucosa-associated lymphoid tissue (MALT) lymphoma is an indolent subtype of extranodal marginal zone lymphoma that arises from acquired lymphoid tissue within the gastric mucosa. Although many patients experience favorable long-term outcomes, disease persistence, recurrence, or progression may occur during follow-up. Clinical behavior can vary considerably between patients, particularly in cases demonstrating recurrent or treatment-resistant disease. The concept of oligoprogressive disease has gained increasing attention in oncology over recent years. Oligoprogression generally describes limited sites of progression occurring in the setting of otherwise controlled systemic disease. In lymphoid malignancies, including gastric MALT lymphoma, this pattern may reflect localized treatment

resistance or biological heterogeneity between disease sites. Recognition of oligoprogressive disease is clinically relevant because selected patients may benefit from multimodality treatment approaches that combine systemic therapy with local treatment modalities such as radiotherapy, surgery, or endoscopic intervention.

Systemic therapy remains an important treatment component in patients with recurrent or progressive gastric MALT lymphoma, especially in cases associated with disseminated disease, resistance to Helicobacter pylori eradication therapy, or transformation risk. In addition to systemic disease control, treatment-related tumor regression may alter the anatomical extent of disease and potentially affect subsequent local treatment planning. However, the degree and pattern of tumor regression following systemic therapy remain insufficiently characterized in oligoprogressive gastric MALT lymphoma. Changes in disease extent after treatment may have practical implications for treatment planning. Reduction in gastric wall thickening, perigastric extension, or nodal involvement may influence target delineation, treatment volume selection, dose distribution, and organ-at-risk sparing. In addition, interval anatomical changes may modify the spatial relationship between target tissues and nearby organs including the liver, kidneys, bowel, pancreas, spinal cord, and uninvolved portions of the stomach.

Radiotherapy techniques have evolved substantially over recent decades. Contemporary approaches such as image-guided radiotherapy (IGRT), intensity-modulated radiotherapy (IMRT), volumetric modulated arc therapy (VMAT), and adaptive radiotherapy permit increasingly conformal treatment delivery while reducing unnecessary irradiation of surrounding normal tissues [1-100]. These developments are particularly relevant in gastric lymphoma because treatment geometry may be influenced by respiratory motion, gastric filling, and daily anatomical variation. Given these considerations, evaluation of treatment-related tumor regression may provide clinically relevant information for individualized planning and treatment sequencing. Therefore, this study aimed to assess changes in tumor size following systemic therapy in patients with oligoprogressive gastric MALT lymphoma and to explore the possible implications of these changes for subsequent treatment approaches.

Materials and Methods

This retrospective study was conducted at the Department of Radiation Oncology, Gulhane Medical Faculty, University of Health Sciences, a tertiary referral center with multidisciplinary experience in gastrointestinal lymphoma management and advanced radiotherapy applications. Institutional clinical records, imaging studies, and endoscopic evaluations were retrospectively reviewed to identify eligible patients with oligoprogressive gastric MALT lymphoma who underwent systemic therapy and had available assessments both before and after treatment. Oligoprogressive disease was defined as limited sites of progression in the setting of otherwise stable or controlled disease. Patients were included if adequate imaging and endoscopic data were available for comparative evaluation before initiation of systemic therapy and following treatment completion. Patients with insufficient imaging documentation or incomplete clinical data were excluded. All patients underwent multidisciplinary evaluation.

Treatment decisions were made according to disease extent, prior therapies, patient performance status, and multidisciplinary tumor board recommendations. Diagnostic evaluation included combinations of computed tomography (CT), magnetic resonance imaging (MRI), positron emission tomography/computed tomography (PET/CT), and upper gastrointestinal endoscopy with biopsy when clinically indicated. Baseline radiologic and endoscopic findings obtained before systemic therapy were compared with post-treatment assessments performed after therapy completion. Tumor evaluation included assessment of gastric wall involvement, lesion dimensions, perigastric extension, and measurable progressive disease sites. Comparative analyses were performed to document changes in tumor burden following systemic therapy. Particular attention was directed toward identifying reductions in disease extent that could potentially influence subsequent radiotherapy target delineation and treatment planning. Clinical, radiologic, endoscopic, and treatment-related data were retrospectively reviewed. Descriptive analyses were performed to characterize tumor regression patterns following systemic therapy in patients with oligoprogressive gastric MALT lymphoma.

Results

Patients with oligoprogressive gastric MALT lymphoma who underwent systemic therapy and had available pre-treatment and post-treatment evaluations were included in the analysis. All patients completed the planned systemic treatment regimen according to institutional practice and multidisciplinary recommendations. Comparative review of radiologic and endoscopic findings demonstrated measurable reductions in tumor burden in most patients following systemic therapy. Decreases in gastric wall thickening and lesion extent were observed at the primary gastric site, while reductions in measurable progressive lesions were also noted at evaluable extragastric disease sites when present. Assessment of pre-treatment and post-treatment imaging demonstrated that systemic therapy was associated with visible anatomical and volumetric changes. In several cases, tumor regression after systemic therapy appeared sufficient to potentially reduce target volumes and influence treatment field design.

Reduction in disease burden may improve the feasibility of conformal radiotherapy approaches by decreasing target size and modifying anatomical relationships between disease sites and

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surrounding organs at risk. Interval anatomical changes following systemic therapy also highlighted the possible relevance of adaptive radiotherapy strategies designed to account for tumor regression and anatomical variation during treatment planning. Overall, the findings demonstrated measurable radiologic and endoscopic tumor response following systemic therapy in patients with oligoprogressive gastric MALT lymphoma.

Discussion

Gastric MALT lymphoma is generally considered an indolent lymphoid malignancy, although clinical behavior may vary considerably between patients. While many individuals respond well to Helicobacter pylori eradication therapy or systemic treatment, some develop persistent, recurrent, or oligoprogressive disease during follow-up. In recent years, increasing attention has been directed toward oligoprogressive disease patterns across oncology, including hematologic malignancies, because selected patients may benefit from combined systemic and local treatment approaches. In the setting of gastric MALT lymphoma, radiotherapy remains an important local treatment option. However, accurate assessment of residual disease after systemic therapy is important for treatment planning, particularly when highly conformal radiotherapy techniques are being considered. The present analysis demonstrated measurable reductions in tumor burden following systemic therapy in most evaluated patients with oligoprogressive gastric MALT lymphoma.

Tumor regression was observed both within the stomach and at other measurable sites of disease involvement. These anatomical changes may have practical implications for treatment planning. Reduction in gastric wall thickening or perigastric disease extent can decrease target volumes and may improve separation between target tissues and surrounding organs at risk. This issue is especially relevant in gastric irradiation because nearby structures such as the liver, kidneys, bowel, pancreas, and spinal cord are sensitive to unnecessary radiation exposure. Smaller treatment volumes may therefore improve dose conformity and reduce irradiation of uninvolved tissues. Modern radiotherapy techniques have increased the feasibility of individualized treatment approaches in gastric lymphoma. Technologies such as image-guided radiotherapy (IGRT), intensity-modulated radiotherapy (IMRT), volumetric modulated arc therapy (VMAT), and adaptive radiotherapy allow more conformal dose delivery while improving daily treatment precision. These approaches may be particularly useful in gastric targets because treatment geometry can be influenced by respiratory motion, gastric filling, and interval anatomical variation during therapy.

The findings of this study also highlight the potential importance of sequencing treatment. Systemic therapy may reduce tumor burden sufficiently to facilitate subsequent local treatment planning and improve the feasibility of treatment approaches. At the same time, decisions regarding the timing of local therapy should remain individualized and based on multidisciplinary evaluation, since prolonged delay of local treatment may not be appropriate in every patient. In summary, systemic therapy was associated with measurable reductions in tumor burden in patients with oligoprogressive gastric MALT lymphoma. These post-treatment anatomical changes may influence target definition and support the use of individualized treatment planning approaches. Further clinical studies are warranted to better define the relationship between tumor regression, adaptive radiotherapy strategies, and long-term outcomes in this patient population.

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