



Research Article

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Evaluation of Changes in Tumor Size After Neoadjuvant Systemic Treatment for Gastrointestinal Stromal Tumor (GIST)



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Abstract

Objective: Gastrointestinal stromal tumor (GIST) arises from the Cajal cells of the gastrointestinal tract, and it presents a health concern around the globe. Management of GIST includes surgery, radiation therapy (RT), and systemic agents. Neoadjuvant systemic therapy may be suggested for management of GIST. In this study, we evaluated tumor size changes after neoadjuvant systemic therapy for GIST.

Materials and methods: Department of Radiation Oncology at Gulhane Medical Faculty, University of Health Sciences serves as a tertiary cancer center for patients from Turkey and abroad for decades. In the context of this study, we aimed at evaluating tumor size changes after neoadjuvant systemic therapy for GIST. To explore this critical issue, patients with GIST having available imaging data as part of initial workup were studied. All included patients received upfront neoadjuvant systemic treatment. We executed a comparative analysis for tumor sizes at diagnostic CT scans of the patients and after neoadjuvant systemic treatment. Tumor size changes following neoadjuvant systemic treatment were documented for comparative evaluation and analysis.

Results: As the primary outcome of our study, we found a mean decrease of 26% in tumor sizes after neoadjuvant systemic treatment for patients with GIST.

Conclusion: Our results may have implications for increased adoption of neoadjuvant treatment approaches for GIST management, however, further studies may clearly be needed to shed light on this critical issue.

Keywords: Gastrointestinal stromal tumor (GIST); Radiation therapy (RT); Neoadjuvant systemic treatment; Molecular imaging methods; Intensity modulation

Abbreviations: GIST: Gastrointestinal Stromal Tumor; RT: Radiation Therapy; IGRT: Image Guided RT; IMRT: Intensity Modulated Radiation Therapy; ART: Adaptive Radiation Therapy

Introduction

Gastrointestinal stromal tumor (GIST) arises from the Cajal cells of the gastrointestinal tract, and it presents a health concern around the globe [1,2]. As a matter of fact, both the disease itself and treatment approaches used for management of GIST may lead to impaired quality of life in affected patients. Management of GIST includes surgery, radiation therapy (RT), and systemic agents [2-7]. In terms of RT, several forms of irradiation could be utilized, and sophisticated approaches including intensity modulation, stereotactic RT, and adaptive RT techniques may lead to improved radiotherapeutic results. Administration of higher irradiation doses may lead to improved disease control results; however, toxicity profile of radiation delivery should

also be considered to maintain patients' quality of life and avoid untowards toxicity. Considerably, recent years have witnessed unprecedented advances in technology which clearly contributed to improved irradiation outcomes. Automatic segmentation techniques, Image Guided RT (IGRT), molecular imaging methods, Intensity Modulated RT (IMRT), stereotactic RT, and adaptive RT (ART) have all been incorporated for improving therapeutic efficacy [3-100].

From the perspective of cancer management, optimal therapeutic results may solely be achieved through close collaboration among related disciplines. Within this context, multidisciplinary tumor boards may contribute to collaboration

among surgical oncologists, radiation oncologists, and medical oncologists by providing an excellent platform for discussing about patient, tumor, and treatment characteristics along with contemplated outcomes of proposed treatment strategies. Neoadjuvant systemic therapy may be suggested for management of GIST [5-7]. The rationale behind neoadjuvant systemic treatment may include reduction of the disease burden before administration of subsequent treatments, mainly surgery. Neoadjuvant systemic treatment may also preclude widespread dissemination of disease. However, there may also be controversies regarding neoadjuvant systemic treatments such as the risk of delayed local treatments. Anyway, selected groups of patients with GIST may benefit from neoadjuvant systemic treatment [5-7]. In this study, we evaluated tumor size changes after neoadjuvant systemic therapy for GIST.

Materials and Methods

Department of Radiation Oncology at Gulhane Medical Faculty, University of Health Sciences serves as a tertiary cancer center for patients from Turkey and abroad for decades. A plethora of benign and malignant tumors are irradiated here by use of modernized equipment and contemporary RT strategies such as IGRT, IMRT, ART, stereotactic RT, automatic segmentation techniques, and molecular imaging methods. In the context of this study, we aimed at evaluating tumor size changes after neoadjuvant systemic therapy for GIST. To explore this critical issue, patients with GIST having available imaging data as part of initial workup were studied. All included patients received upfront neoadjuvant systemic treatment. We executed a comparative analysis for tumor sizes at diagnostic CT scans of the patients and after neoadjuvant systemic treatment. Tumor size changes following neoadjuvant systemic treatment were documented for comparative evaluation and analysis.

Results

Current study has been intended for exploring tumor size changes following neoadjuvant systemic therapy for GIST. All included patients have been individually evaluated by a multidisciplinary team of experts from surgical oncology, medical oncology, and radiation oncology before management. Patients with GIST having available imaging data as part of initial workup were included. Selected patients initially received upfront neoadjuvant systemic therapy. We have performed a comparative analysis for tumor sizes at diagnostic CT scan of the patients and after neoadjuvant systemic treatment. Tumor size changes after neoadjuvant systemic treatment were documented for comparative analysis. As the primary outcome of our study, we found a mean decrease of 26% in tumor sizes after neoadjuvant systemic treatment for patients with GIST.

Discussion

Gastrointestinal stromal tumor (GIST) arises from the Cajal

cells of the gastrointestinal tract, and it presents a health concern around the globe [1,2]. As a matter of fact, both the disease itself and treatment approaches used for management of GIST may lead to impaired quality of life in affected patients. Management of GIST includes surgery, radiation therapy (RT), and systemic agents [2-7]. In terms of RT, several forms of irradiation could be utilized, and sophisticated approaches including intensity modulation, stereotactic RT, and adaptive RT techniques may lead to improved radiotherapeutic results. Administration of higher irradiation doses may lead to improved disease control results; however, toxicity profile of radiation delivery should also be considered to maintain patients' quality of life and avoid untowards toxicity. Considerably, recent years have witnessed unprecedented advances in technology which clearly contributed to improved irradiation outcomes. Automatic segmentation techniques, Image Guided RT (IGRT), molecular imaging methods, Intensity Modulated RT (IMRT), stereotactic RT, and adaptive RT (ART) have all been incorporated for improving therapeutic efficacy [3-100].

From the perspective of cancer management, optimal therapeutic results may solely be achieved through close collaboration among related disciplines. Within this context, multidisciplinary tumor boards may contribute to collaboration among surgical oncologists, radiation oncologists, and medical oncologists by providing an excellent platform for discussing about patient, tumor, and treatment characteristics along with contemplated outcomes of proposed treatment strategies. Neoadjuvant systemic therapy may be suggested for management of GIST [5-7]. The rationale behind neoadjuvant systemic treatment may include reduction of the disease burden before administration of subsequent treatments, mainly surgery. Neoadjuvant systemic treatment may also preclude widespread dissemination of disease. However, there may also be controversies regarding neoadjuvant systemic treatments such as the risk of delayed local treatments. Anyway, selected groups of patients with GIST may benefit from neoadjuvant systemic treatment [5-7].

In this study, we evaluated tumor size changes after neoadjuvant systemic therapy for GIST. To explore this critical issue, patients with GIST having available imaging data as part of initial workup were studied. All included patients received upfront neoadjuvant systemic treatment. We executed a comparative analysis for tumor sizes at diagnostic CT scans of the patients and after neoadjuvant systemic treatment. Tumor size changes following neoadjuvant systemic treatment were documented for comparative evaluation and analysis. As the primary outcome of our study, we found a mean decrease of 26% in tumor sizes after neoadjuvant systemic treatment for patients with GIST. Admittedly, our results may have implications for increased adoption of neoadjuvant treatment approaches for GIST management, however, further studies may clearly be needed to shed light on this critical issue.

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