Outcome and toxicity of Stereotactic radiotherapy in patients with brain metastases from gastrointestinal cancer

Michele Aquilano[1],Mauro Loi[2],Marianna Valzano[2],Alessandra Galardi[2],Gabriele Simontacchi[2],Daniela Greto[2],Isacco Desideri[2],Luca Visani[2],Ilaria Morelli[2],Giulio Frosini[2],Ilaria Bonaparte[2],Niccolò Bertini[2],Chiara Mattioli[2],Carlotta Becherini[2],Marta Casati [3],Stefania Pallotta [3],Raffaella Doro [4],Laura Masi[4],Lorenzo Livi [2],Pierluigi Bonomo [2]

1 IFCA, Radiation Oncology Department, Florence, Italy; 2 Radiation Oncology Unit, Azienda Ospedaliera Universitaria Careggi, University of Florence, Florence, Italy; 3 Medical Physics Unit, Azienda Ospedaliero-Universitaria Careggi, Florence, Italy.;4 Department of Medical Physics and Radiation Oncology, IFCA, Florence, Italy;

INTRODUCTION

The incidence of brain metastases from Gastrointestinal primary tumors (GI-BMs) is approximately of 6%. Appropriate management of these patients, who often presents at advanced disease stage, is poorly defined. Stereotactic Radiotherapy (SRT) could be proposed to improve symptoms and extend disease control. The aim of this study is to assess the impact of SRT in this population.

METHODS AND MATERIALS

Data from consecutive patients treated for GI-BMs with SRT from March 2015 to March 2024 were retrospectively collected. Dose was expressed as Equivalent Dose in 2Gy Fractions (EQD2). Intra-Cranial Control (IC) and Overall Survival (OS) were calculated from date of SRT to event (intracranial relapse and death respectively) or last follow-up.

RESULTS

Fifty-four patients (median age 68 years, range 46-84) accounting for 98 GI-BMs were included. Primary tumors were colorectal and gastro-oesophageal adenocarcinoma in 37 (68.5%) and 17 (31.5%) patients respectively. Eighteen (33%) patients presented with a single GI-BM. There was extra-cranial disease in 41 (76%) patients, including unresected/relapsing primary tumor in 9 (17%) cases. Detection of BMs occurred at diagnosis in 8 (15%) patients, as first site of relapse in 27 (50%) or as progression of known metastatic disease in 19 (35%) patients. Before SRT, surgery and/or WBRT were performed in 10 (19%) and 5 (9%) patients respectively. For each SRT course a median of 1 (range 1-5) GI-BMs was treated. Dose regimens consisted of 12-30 Gy in 1-5 fractions, to a median EQD2 of 50 Gy10 (range 22-68). A second SRT course for out-of-field intracranial progression was performed in 7 patients (13%). First- and further chemotherapy lines were administered in 39 (72%) and 15 (28%) patients respectively. IC rate was 88% at 6 months and 70% at 1 year (Fig.1). At univariate analysis (UVA) no variables were correlated with IC. Median OS was 11 months (IC 95% 9-16), 6-months and 1-year OS rate was respectively 76% and 48% (Fig.2) Only systemic treatment beyond first line was correlated with OS at UVA (4 versus 15 months, p=0.02) (Fig.3). Two (4%) patients developed mild symptomatic radionecrosis.

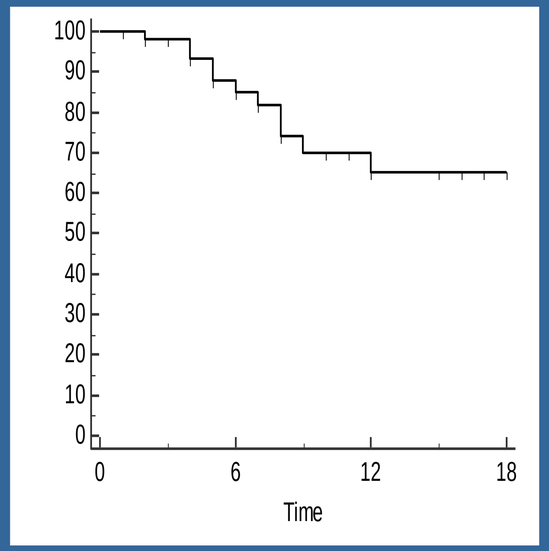

Figure 1. Intracranial Control

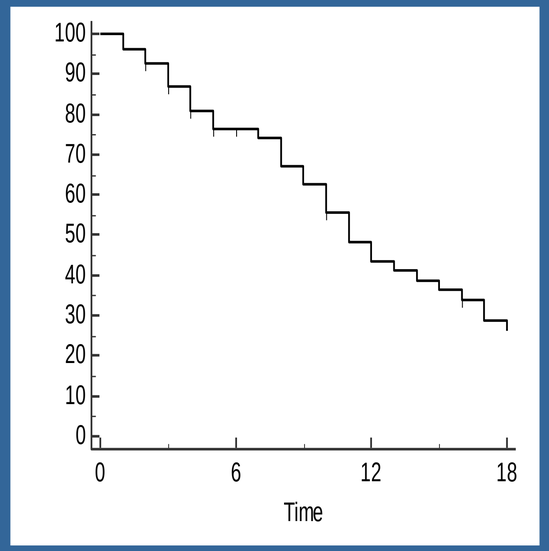

Figure 2. Overall Survival

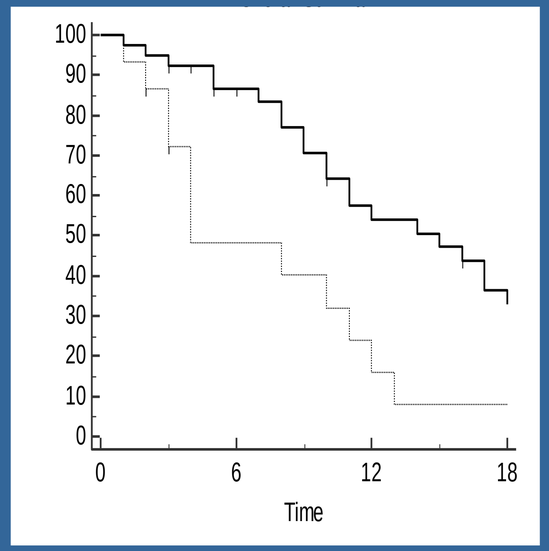

Figure 3. Overall Survival at UVA

CONCLUSIONS

Onset of GI-BMs can occur at any stage of disease. Despite poor overall outcome, selected patients may benefit from SRT to improve IC, particularly in association with first-line systemic treatment. Multiple SRT courses can be delivered in case of further intracranial recurrence.
Symptomatic radionecrosis may occur in less than 5% of cases.

STRATEGIC FORESIGHT

Further data is needed to confirm the appropriate selection of patients who could benefit SRT for GI-BMs

AKNOWLEDGEMENTS

We thank Fondazione Radioterapia Oncologica (FRO) for their engagement in support of cancer patients.

CONTACTS

aquilanomichele@gmail.com
@MicheleAquilano
Michele Aquilano