

Cancer of Right Breast with Single Liver Metastasis - Simultaneous Treatment of Chest Wall with Radiotherapy for Carcinoma Breast and SBRT for Liver Lesion - Procedural Details of the Complex Procedure

Open Access

Abstract

Published 02/11/2022

Copyright

© Copyright 2022

Damodara et al. This is an open access abstract distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 4.0

Priyasha Damodara¹, KANHU CHARAN PATRO², CHITTARANJAN KUNDU², PARTHASARATHI BHATTACHARYYA², VENKATA KRISHNA REDDY PILAKA², PRABHU A C², SRINU AKETI², ANIL KUMAR AYYALASOMAYAJULA², Prasad P²

1. Radiation Oncology, Mahatma Gandhi Cancer Hospital and Research Institute, Visakhapatnam, IND 2. Radiation Oncology, MAHATMA GANDHI CANCER HOSPITAL AND RESEARCH INSTITUTE, VISAKHAPATNAM, IND

Corresponding author: Priyasha Damodara, priyashadamodara@gmail.com

Categories: Medical Physics, Radiation Oncology

Keywords: stereotactic body radiotherapy, liver metastases, breast cancer, oligometastases

How to cite this abstract

Damodara P, PATRO K, KUNDU C, et al. (February 11, 2022) Cancer of Right Breast with Single Liver Metastasis - Simultaneous Treatment of Chest Wall with Radiotherapy for Carcinoma Breast and SBRT for Liver Lesion - Procedural Details of the Complex Procedure. Cureus 14(2): a692

Abstract

Objective: Breast cancer with oligometastasis is not uncommon. Greater therapeutic advantage has been reported in various literatures as better treatment technique evolves. Here we are reporting a case of ductal carcinoma right breast with a single metastasis to liver. This patient is treated with radical intent with chemotherapy, surgery and then followed by radiotherapy to right chest wall along with stereotactic body radiotherapy (SBRT) for liver metastasis. Though apparently it looks a simple procedure, but lots of complexity is involved in its treatment as part of the liver also comes into radiation field as we deliver radiation to chest wall. Here we present the procedural details of this complex procedure.

Methods: A 56 year female presented with a lump which is situated in upper and outer quadrant of right breast. It was not tender, firm and mobile. The patient was investigated in the line of breast cancer for further management. Histopathology and receptor studies of this patient revealed it to be infiltrative duct carcinoma, oestrogen receptor positive, progesterone receptor positive and HER2 negative. Her metastatic work up revealed a single 2 x 2cm lesion in segment VI of liver suggestive of distant metastasis. PET CT scan showed local breast lesion [3.3 x 2.6cm size with SUV max- 8.4], right axillary node [2-centimetre size-SUV max-1.4] and liver lesion in segment VI - 17x 16mm with SUV-9.3]. After discussion in multi-disciplinary tumour board, it was decided to treat the patient with radical intent with neo-adjuvant hormonal therapy followed by modified radical mastectomy and chest wall radiation and stereotactic body radiotherapy for liver lesion. Patient was also planned to receive tab Palbociclib (125mg) per oral daily for 3weeks on and one week off, for 3 cycles; along with Letrozole (2.5mg) once daily. After completion of neoadjuvant chemotherapy there was a good clinical response in breast lesion with stable liver lesion. Then patient underwent surgery, Modified radical mastectomy and axillary dissection. Histopathology was ypT2N1AM0. She was then subjected to external radiation to right chest wall by DIBH technique and SBRT for liver lesion.

Results: It is a right sided breast cancer and during chest wall irradiation some part of liver also gets irradiated. Also, simultaneously the patient is planned for SBRT for liver lesion. It seems to be a complicated procedure as part of liver comes into the radiation field twice, during EBRT to chest wall and during SBRT to liver lesion. Keeping these in mind the patient is planned for both, for chest wall radiotherapy by tangential field with DIBH technique and for SBRT to liver lesion with same DIBH using ABC [active breath control]. First, the triple phase CT of liver lesion is analysed. It is found that the lesion is more prominent and enhancing in arterial phase. Planning CT scan was taken for liver, with Deep Inspiratory Breath Hold technique, using Active Breath Coordinator (ABC). The timing of breath hold was made such that it will coincide with starting of arterial phase. Then planning CT for right chest wall with DIBH using ABC software was taken with CT slices from mandible to umbilicus. The target volumes are contoured as per ESTRO contouring guidelines and the patient received the radiation to right chest wall and supraclavicular fossa to a total dose of 40.05 Gy in 15 fractions as per START B protocol. It is tried to keep the liver dose to as minimum as possible and the mean liver dose in chest wall plan with DIBH was calculated. In second plan i.e.; SBRT the liver lesion was planned for 15Gy X 3 factions with a BED of more than 100Gy. Again, we calculated the mean liver dose to the (Liver-GTV). We fused chest wall CT and SBRT CT and calculated cumulative liver mean dose was 10Gy and we kept the constraints as per TG101 PROTOCOL and liver-GTV D700 cc was 3 Gy.

Now a days, for carcinoma breast having oligometastasis, the trend is to treat it with intention to cure. Statistics show that the incidence of localized breast cancer is 29%, loco regional 57%, distant metastasis 10.3% and spread to unknown extent is 3.7% at the time of diagnosis (Indian statistics vide national cancer

registry program published by ASCO 2020). There are no clear-cut guidelines for the procedural details about chemo therapy and radiotherapy sequencing. There are also no guidelines for treatment of local and metastatic disease with radiotherapy. Here we treated the patient with radical intent. We did not find any comparable literature about procedural details of cases like this. We explained here the procedures that are being followed here in details. It is being suggested that, if there happens to be similar situation, breast cancer with oligometastasis to liver and following DIBH technique to treat both with radical intent, to follow the procedure laid down here. If you plan the breast/ chest wall without DIBH, the liver may get more radiation doses and; if you do not fuse both the planning CTs you cannot calculate the cumulative dose to the liver which is very vital for such type treatment.

STEPS TO BE FOLLOWED

Step 1: Plan with motion management system for such type of situation

Step 2: Take planning CT for both chest wall for ca breast and abdomen for Liver SBRT with desired motion management system. For simulation there will be two planning CT in the same sitting without disturbing the patient, so that it can be fused perfectly for dosimetry

Step 3: Plan the chest wall or for breast with tangential fields and block the liver as much as possible

Step 4: Plan SBRT for liver and avoid beam entry in upper part of liver if possible

Step 5: Fuse both planning CT [CT thorax and CT abdomen] and calculate the combined mean dose to liver.

Step 6: Execute the treatment as per plan with daily CBCT and motion management.

Conclusion: This type treatment procedure and technique can be undertaken in primary breast cancer with oligometastasis to liver. It should be done with extreme caution, with meticulous attention to motion management for both primary breasts during chest wall irradiation as well as during SBRT for liver metastasis. Liver dose constraint has to be kept in consideration while planning for Liver SBRT. With availability of advanced treatment technique there is a paradigm shift of treatment intent of metastatic carcinoma breast. For oligometasis, still the treatment intent can be radical with availability of better chemo therapy and advance radiotherapy techniques. It is now possible when the distant metastasis is oligometastasis and there is availability of advance treatment technique metastatic breast cancer can be approached with radical intent.