

Case Report

Open Access

3D Conformal Total Liver Radiotherapy for Locally Advanced Hepatocarcinoma: A Case Report

Papa Macoumba Gaye¹, Mouhamadou Bachir Ba¹ and Ousseynou Sarr¹

Radiotherapy Department at Dalal Jamm Hospital Dakar-Senegal

ABSTRACT

Hepatocarcinoma is the third localization of cancer in Senegal. More than 90 per cent of these cases in Senegal are painful locally advanced stages. Radiotherapy is helpful in palliative situation. Newer radiation techniques, such as stereotactic body radiation therapy (SBRT) help reducing the radiation to nearby healthy tissues. This technique is not available in our institution. We report a case of 3D conformal total liver radiotherapy for locally advanced hepatocarcinoma.

***Corresponding author**

Papa Macoumba Gaye, Radiotherapy department at Dalal Jamm Hospital Dakar-Senegal, E-Mail: mbbachir21@gmail.com

Received: August 15, 2020; Accepted: August 21, 2020; Published: August 26, 2020

Keywords: Liver, Radiotherapy, Hepatocarcinoma.

Introduction

Hepatocarcinoma is the third localization of cancer in Senegal (1). More than 90 per cent of cases in Senegal are painful locally advanced stages (2). Radiation therapy may not be a good option for some patients whose liver has been greatly damaged by diseases such as hepatitis or cirrhosis. Although liver cancer cells are sensitive to radiation, much care is taken when planning the treatment to avoid damaging normal liver tissue. External Beam Radiation therapy (EBRT) can be indicated for: unresectable tumors, bad response after embolization, metastatic disease, thrombus blocking the portal vein and remaining pain after morphinic treatment. EBRT treatments are small doses of radiation given 5 days a week for several weeks in the curative situation or in single dose for palliative option. Newer radiation techniques, such as stereotactic body radiation therapy (SBRT) target liver tumors while reducing the radiation to nearby healthy tissues (3). These new techniques are not available in our institution. We report one case of total liver radiotherapy for hepatocarcinoma done by 3D conformal (3DCRT) techniques in Dalal Jamm hospital of Dakar.

Case Report

We received on December 2019 a 65 old patient who present liver pain and loss of weight (10% in 3 months). Clinical exam found no icterus, moderate ascite, hepatomegaly (16 cm). Ultrasonography reveals a bulky liver mass (12 cm). CT scan revealed multinodular tumors of the right and left segment with a portal vein thrombus (fig 1).

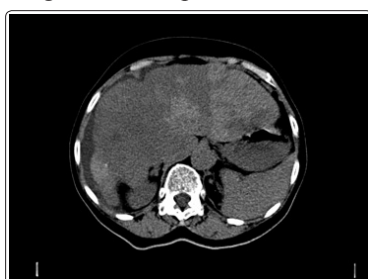


Figure 1: Axial CT scan of a heteromultinodular hepatic tumor

Biological exam found: Haemoglobin is 14,7 g/dl, Transaminases (ASAT=134 IU/L, AFP=568 IU/L, Gamma GT =853IU/L, Alkaline phosphatase =489UI/L; and B positive hepatic serology. Fine needle biopsy guided by ultrasonography show a hepatocarcinoma .It is a stage IV unresectable tumor (T4 N0 M1). After 1 month of adaptative morphinic treatment, remaining permanent pain is quoted 8/10. Palliative Radiotherapy was indicated and the prescribed dose is 8 Gy. CT Simulation is done with 3mm cross sections from diaphragm to the hip bone. We treat with a 4-field 3 D conformal radiotherapy after dosimetry (fig 2).

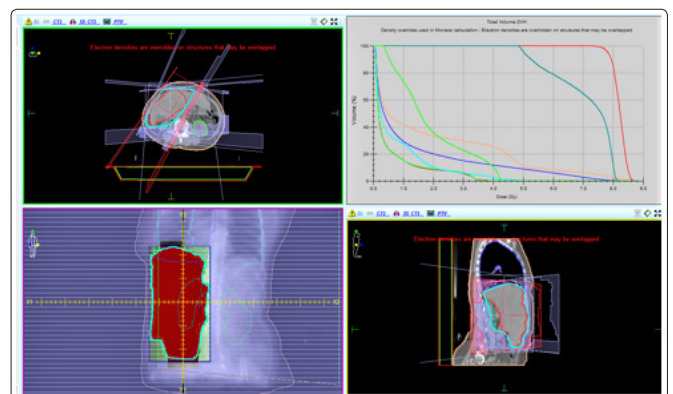


Figure 2: 4 Fields technique of 3 D Conformal Radiotherapy

The dose distribution is shown in (table 1).

Table 1: Dose distribution Dosimetric distribution in the organs at risk and in the target volume

Structure	Volume (cc)	Min. Dose (Gy)	Max. Dose (Gy)	Mean Dose (Gy)	Colt Ref. (Gy)	Volume < (cc)	Volume < (%)	Hot Spot (Gy)	Volume > (cc)	Volume > (%)	Min Volume	Bin 05	Heterogeneity Index	Conformity Index
Carton Fiber	1020.303	0.010	4.022	0.330							99.31	no	0.044	
Esophagus	816.450	0.010	3.020	0.300							99.31	no	0.031	
PTV	1764.900	6.761	8.778	8.300			7.030	1699.712	95.000	100.000	yes	1.000		
Spinal Cord (Spine)	15760.000	0.010	8.861	1.520							98.76	no	120.94	
pancreas dose	126.740	0.040	9.520	1.770				8.000	4.464	3.52	99.91	no	0.171	
gastric antrum	136.910	0.040	4.930	0.792				8.000	0.300	0.00	99.82	no	0.164	
ren dose	139.220	4.762	8.302	7.095				8.000	10.377	11.00	100.00	yes	1.000	
ren pelvicle	128.010	0.381	4.991	1.921				8.000	0.000	0.00	100.00	yes	0.961	

A total response on pain is obtained at 4 months. A marked improvement in his hepatic biological assessment was observed with ASAT at 19 IU / L, GGT at 230 U / L and alkaline phosphatase

at 286 U / L) and a reduction in alphafoetoprotein at 3 months post radiotherapy to 59.7 IU / L . Patient died after 7 months.

Discussion

The annual number of locally advanced and metastatic hepatocarcinoma deaths is equivalent to that of new cases, which means that the mean survival does not exceed not 1 year. 5-year survival all stages combined varies between 3% and 5% in cancer registries that track recorded cases (4). Pain occurs in 85% of patients seen in Senegal (2). Failure after opioid treatment is observed in nearly 25% of these liver tumors (5). Newer techniques such as stereotactic radiotherapy (SBRT) help preserving healthy tissues (3). The local dose constrains with stereotaxic radiotherapy are: 30 % receiving less than 60 Gy and 50 % of total liver less than 29.3 Gy. In conformational radiotherapy with or without intensity modulation, these dosimetric constraints are revised downwards without the risk of major hepatic toxicity. The efficacy and tolerance of radiotherapy in hepatocellular carcinoma has now been demonstrated, whether in curative treatment by conventional fractionation or under stereotaxic conditions, but also and especially in a palliative situation for pain and symptoms. 8Gy/1Fr palliative RT has shown promising evidence on symptom palliation in advanced hepatocellular carcinoma Tumor especially in symptoms, AFP response and median survival even if its efficacy in disease control and safety has not been reported . Resolution of pain after single dose of radiotherapy varies from 50 to 70 % with a median duration of 4 months (6-9).

Conclusion

In locally advanced hepatocellular carcinoma, conformational radiotherapy optimized in single dose is effective in a palliative indication for pain, tumor control without increased hepatic toxicity.

Conflicts of Interest

The authors declare no conflicts of interest.

References

1. Cancer today [Internet] (2020). Disponible sur: <http://gco.iarc.fr/today/home>
2. Diop Ad, Niang Fg, Diop An, Diop Sb, Niang E (2019) Chimioembolisation des carcinomes hépatocellulaires au Sénégal: évaluation de 20 procédures réalisées en 3 ans d'activité. *J Afr Imag Médicale* 11.
3. Tétreau R, Llacer C, Riou O, Deshayes E (2017) Evaluation of response after SBRT for liver tumors. *Rep Pract Oncol Radiother* 22: 170-175.
4. Lambert R (2009) Épidémiologie du carcinome hépatocellulaire (CHC) dans le monde. *Cancéro Dig*.
5. Kumar M, Panda D(2014) Role of Supportive Care for Terminal Stage Hepatocellular Carcinoma. *J Clin Exp Hepatol [Internet].4: S130-9*. Disponible sur: <https://linkinghub.elsevier.com/retrieve/pii/S0973688314002266>
6. Michel R, Françoise I, Laure P, Anouchka M, Guillaume P, Sylvain K (2017) Dose to organ at risk and dose prescription in liver SBRT. *Rep Pract Oncol Radiother* 22: 96-102.
7. Mornex F, Girard N, Merle P, Béziat C, Kubas A, Wautot V (2005) et al. Tolérance et efficacité de la radiothérapie de conformation en cas de carcinome hépatocellulaire chez le patient cirrhotique. Résultats de l'essai de phase II RTF1. *Cancer/Radiothérapie*. 9: 470-476.
8. Yeung SY, Tung Y, Wong CS, Lee AS, Chiang CL (2017) 8Gy Single Fraction (8Gy/1Fr) Palliative Radiotherapy (RT) For Hepatocellular Carcinoma (HCC): Safety And Efficacy. *Liver Cancer*.
9. Blanc J-F (2014) Prise en charge thérapeutique du carcinome hépatocellulaire: hiérarchisation des traitements. *Lett Hépatogastroentérologue* 20: 1-52.

Copyright: ©2020 Papa Macoumba Gaye, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.