RADIOTHERAPY FOR SPLENOMEGALY

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ABSTRACT

Radiotherapy for massive, symptomatic splenomegaly has been used in a palliative setting since the early 1990's. Massive splenomegaly may be seen in CML, CLL, hairy cell leukemia and splenic marginal zone lymphomas, prolymphocytic leukemia, myeloproliferative disorders such as polycythaemia rubra, polycythaemia vera or essential thrombocytosis or myelofibrosis.

Splenic radiation therapy has been shown to be effective in palliation of the signs and symptoms due to massive splenomegaly.

We present here one such case of myelofibrosis where the patient was treated with radiotherapy to the spleen for symptomatic relief. The patient achieved excellent response to the treatment.

Key Words: Hematological conditions, massive splenomegaly, palliative radiotherapy.

CASE REPORT

A 50-year-old male presented with complaints of lump in the abdomen associated with abdominal distension, early satiety and loss of appetite of 4-months duration.

Clinical examination revealed massive splenomegaly occupying nearly the entire abdomen, crossing the midline with stretching of the overlying abdominal skin. There was also mild hepatomegaly. Ultrasonography (USG) abdomen revealed enlarged liver and a grossly enlarged spleen causing compression and displacement of the left kidney. CECT scan revealed huge remarkable enlargement of spleen with obvious lobullation, extending into the left pelvic cavity along with stipulated calcification in its parenchyma with no other organomegaly or lymphadenopathy.

Routine blood counts revealed PCV 51%, WBC 29,200 with P 80%, L 12%, E 6%, Hb 16.6 gm/dl and platelets count of 1,67,000/mm. Bone marrow aspiration and biopsy demonstrated myelofibrosis. After all investigations, he was finally diagnosed as a case of myelofibrosis with massive symptomatic splenomegaly and opinion of surgical oncologist was taken for feasibility of splenectomy. Splenectomy was ruled out as a treatment

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option for this patient due to presence of co-morbid conditions such as diabetes mellitus and ischemic heart disease. Hence the patient was referred for palliative radiotherapy to the spleen. The patient was planned on simulator (Ximatron from Varian). The initial field size was 21x21 cm (covering the entire enlarged spleen with a 1 cm margin) (Fig 1).

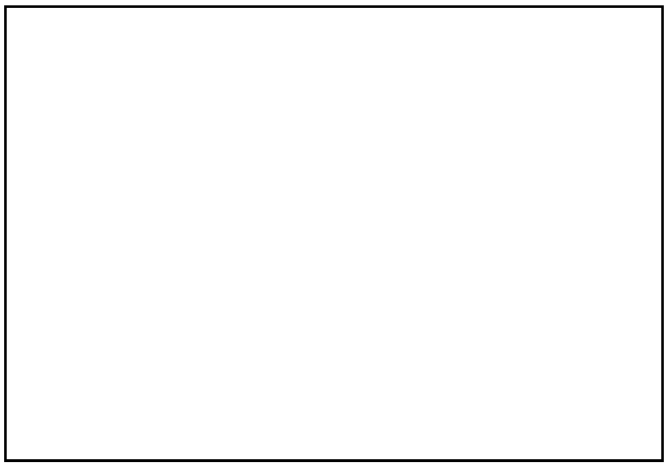

Fig. 1

The patient received treatment on a Linear accelerator (Clinac2300CD with MLC and Portal vision from Varian, USA) using 6 MV photon beam with anterior-posterior parallel-opposed portals.

The patient was treated to a total dose of 8.6 Gy over 19 days with 50 cGy per fraction; the treatment being delivered on every alternate day with strict monitoring of his blood counts especially TLC. The treatment field size was shrunk during the treatment according to the response of the spleen (Fig.2, 3). He

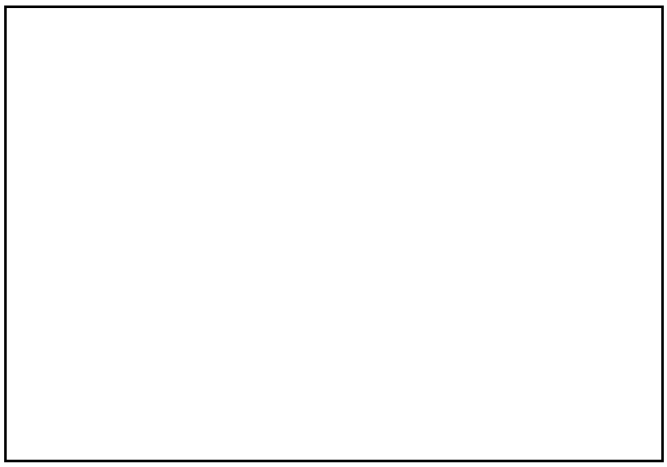

Fig. 2

completed his treatment without any untoward complications or treatment gaps and on completion his final field size was only 13x13 cm (Fig 4). The patient was evaluated regularly during the treatment for response and possible side effects. During the treatment he encountered only mild nausea, which was managed with antiemetics. At the end of the treatment, the patient had no distension of the abdomen, pain or any of the earlier presenting complaints.

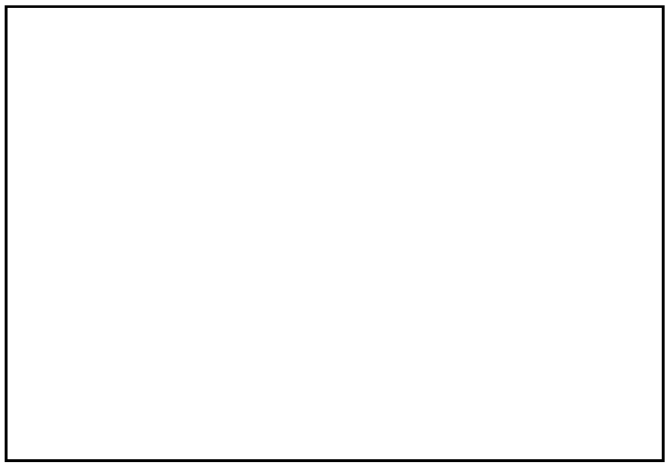

Fig. 3

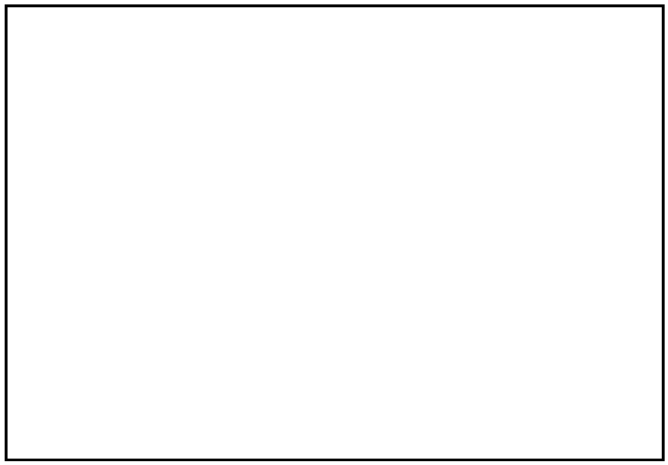

Fig. 4

At one-month follow up, he had no specific complaints and clinical examination revealed mild splenomegaly. His blood examination revealed normal counts with only mild anisocytosis in the peripheral blood picture.

The patient has been asked to come for a monthly follow up.

DISCUSSION

Massive splenomegaly may be seen in CML, CLL, hairy cell leukemia and splenic marginal zone lymphomas where the spleen can extend into the pelvis.

Significant splenomegaly also may occur with prolymphocytic leukemia, myeloproliferative disorders such as polycythaemia rubra, polycythaemia Vera, essential thrombocytosis or myelofibrosis. It is important to recognize which conditions of splenomegaly are the results of extramedulary hematopoiesis rather than leukemic infiltration because whole spleen irradiation with minimal radiation doses can result in severe, long lasting pancytopenia. Since the early 1900s up to approximately 1950, total body or splenic radiation therapy was shown to be effective in palliation of the signs and symptoms due to splenomegaly.[1,2,3]

It is a rarely used modality today because effective systemic treatments have been developed. Nevertheless, the radiation oncologist is called upon to assist with the management of symptomatic splenomegaly from these hematologic disorders from time to time, often with excellent results.[4,5,6] In an elderly patient with other co-morbidities, palliative splenic radiotherapy can offer significantly less risk relative to splenectomy.[7]

Anterior and posterior portals for photon treatments are generally used. Although it has been a common practice to treat the whole spleen using ultrasound or CT scanning to assist with field borders, one may treat just part of the spleen, especially if one is worried about precipitating severe neutropenia or thrombocytopenia.

It is recommended to treat patients with low doses per fraction, two to three times a week rather than daily (the conventional dose per fraction is 2 Gy in other malignancies, with treatment being delivered daily) with close monitoring of blood counts.[8]

For leukemic infiltration of the spleen, starting at doses of 0.5 to 1.0 Gy per fraction is considered reasonable. Patients felt to have extramedulary hematopoiesis may be treated with even lower doses of 0.2 to 0.5 Gy per fraction.[9] Radiation doses may then be titrated based on response that may be monitored easily by clinical examination and hematologic toxicity.

Nausea is uncommon with these low-dose fractions but can be easily managed with antiemetics, if necessary. There can be rapid cell lysis, allopurinol to prevent uric acid nephropathy is advised. Renal toxicity from radiation in this setting is rare.

As the spleen responds, it is best to shrink the treatment field accordingly. Total radiation dose delivered in this setting is determined clinically when palliation is achieved.

For leukemic infiltration, total doses are typically in the range of 4-10 Gy. For myelodysplastic conditions or extramedulary/ intrasplenic hematopoiesis, total doses of 1-9 Gy are usually adequate.

CONCLUSION

Splenic irradiation can effectively palliate symptomatic splenomegaly due to hematological premalignant or malignant conditions in patients for whom splenectomy is not an option.

Re-treatment with irradiation is possible in patients who have recurrent symptomatic splenomegaly and have been previously irradiated.

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