Case Report

Pre-operative chemoradiation for a patient with locally advanced cancer of the rectum complicated by a left pelvic kidney: A case report from cancer diseases hospital, Lusaka – Zambia

Maurice Mwale[1], Lewis Banda[1], Antony Sinalume[2]

From [1]Consultant Clinical Oncologist, Department of Clinical Oncology, Cancer Diseases Hospital, Lusaka, Zambia, [2]Senior Radiation Therapist, Radiation Therapy, Lusaka, Zambia

ABSTRACT

Neoadjuvant chemoradiotherapy (CRT) for rectal cancer complicated by a left pelvic kidney is presented as a case report here. A 38-year-old lady was seen with locally advanced rectal cancer. The computed tomography scan also showed an ectopic left pelvic kidney. The patient was planned for radical CRT and was to receive 45 Gy to pelvis plus a 5.4 Gy as a rectal boost. The concurrent chemotherapy was 5-fluorouracil and leucovorin. This was with 2D treatment planning technic which poses a big risk for permanent kidney damage. The 2D treatment plan, however, appeared to be sufficient even though the mean tolerance doses of 15–18 Gy for the kidney could not be proved. This, however, could be at the expense of tumor control.

Key words: Pelvic kidney, Chemoradiotherapy, Rectal cancer, Treatment planning technique

Colorectal cancer is a common health problem. It is the third most common cancer type after lung and breast. More than 1 million new cancer cases are diagnosed annually with half a million dying from the disease [1]. The treatment of rectal cancer is a multimodality approach and involves surgery, chemotherapy, and radiotherapy. In locally advanced disease, chemoradiation may be the first treatment followed by surgery and chemotherapy alone. Pre-operative chemoradiation is used to downstage and facilitates sphincter-saving surgery [1]. Neoadjuvant therapies also reduce the chance of locoregional recurrence and improve survival. Acute and chronic toxicities related to radiotherapy are also less compared to post-operative treatment (2).

Technical advances in radiotherapy with increasingly higher energy irradiation deliver adequate doses to deeper structures with minimal doses to superficial structures [2]. Pre-operative chemoradiation with radiation doses of up to 50.4 Gy with concurrent 5-fluorouracil (at 1000 mg/m^2 D1 to 4 and past 4 days of radiotherapy) is used for all locally advanced stage cancer of the rectum. This is followed by surgery and chemotherapy. A comparison study between intensity-modulated radiotherapy (IMRT) and 3D-conformal radiotherapy for rectal cancer concluded that IMRT reduces treatment breaks, hospitalization, and higher grade toxicities compared to 3D-conformal radiotherapy [3].

This case of rectal cancer complicated by a pelvic kidney is a rare occurrence and poses a big challenge in the management. 3D treatment technics and other advanced planning technics like IMRT have improved the outcome of such patients. However, with the use of low technics such as 2D, the management of rectal cancer complicated by a pelvic kidney poses a nightmare due to either permanent kidney damage or poor tumor control.

CARE REPORT

A 38-year-old business lady was referred for further management from the University Teaching Hospital, surgery department with a diagnosis of adenocarcinoma (well-differentiated) of the rectum. The patient presented with a 6 months history of abdominal pains and bloody stools. No significant family history was noted.

General examination showed a patient with the performance state of 1 with no signs suggestive of distant metastasis. Nutritional status was also good. Local examination revealed a locally advanced rectal tumor which was about 6 cm from the anal verge.

The staging computed tomography (CT) scan also confirmed the rectal mass which was measuring about 90 mm from the sigmoid junction and 20 mm in thickness. This is shown in Figure 1a. The CT scan also showed the presence of an ectopic

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Correspondence to: Dr. Maurice Mwale, Cancer Diseases Hospital, 1st Nationalist Rd., Box 51337, Lusaka, Zambia. E-mail: kamulaza@gmail.com

left pelvic kidney. The ectopic kidney is shown in Figure 1b and is localized to the left. Intravenous pyelogram showed the normal excretory function of both kidneys as well as normal kidney function tests.

The patient was discussed at our multidisciplinary team and the plan was to treat her with pre-operative chemoradiotherapy (CRT). This was mainly to downstage the tumor. This was to be followed by surgery and chemotherapy. The patient was counseled about the effects of radiation on the ectopic kidney as she was quite apprehensive over the radiotherapy and not willing to have only one functional kidney. The plan was to treat the patient with a four-field box technique using a 2D treatment plan, as shown in Figures 2a and b. Figure 2a shows the anteroposterior (AP) view of the radiotherapy field, while Figure 2b shows a lateral view of the radiotherapy field using a 2D treatment technique. The total radiation dose was 50.4 Gy (45 Gy to the pelvis and a rectal boost of 5.4 Gy). Generous left pelvic kidney block is shown in the AP view in Figure 2a as well as the lateral view in Figure 2b of the pelvic fields.

Our patient never came back for treatment and a follow-up with repeated calls indicated that our patient had died from a local hospital and relatives could not give the exact cause of death.

DISCUSSION

The above case is that of a rectal tumor plus left pelvic kidney which was planned for neoadjuvant CRT using a 2D treatment planning technique. To start with, the presence of an ectopic pelvic kidney is a rare occurrence seen in 1 in every 2100 cases [4-6].

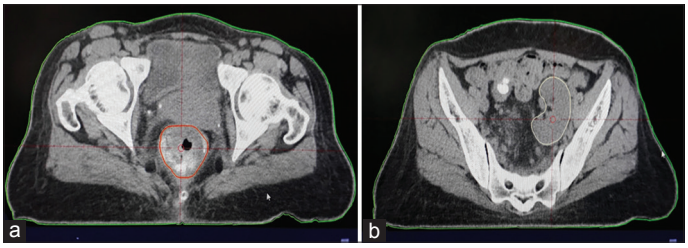

Figure 1: The staging computed tomography scan shows the (a) locally advanced rectal carcinoma and (b) the left pelvic kidney

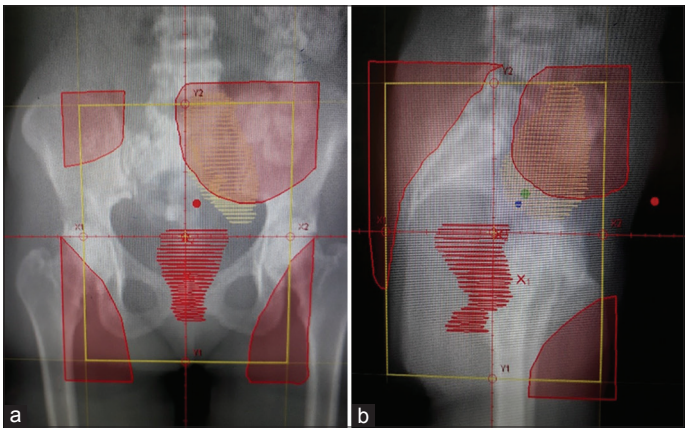

Figure 2: (a) Anteroposterior view of the pelvic field with generous shielding; (b) left lateral view of the pelvic field with the generous shielding of the pelvic kidney

The concurrence of a pelvic kidney and a rectal tumor is even a rarer phenomenon [4]. This form of relationship possesses a lot of challenges in terms of treatment, especially with the delivery of higher doses of radiotherapy. This is mainly due to possible permanent injury to the kidney and also the organs at risks such as the bladder, femoral head, and bowel. There is no standard approach to the treatment of concurrence of the pelvic tumor and rectal cancer. Some centers may not be able to even treat such a patient with radiotherapy [7]. This case also posed a big challenge to us though it was planned as above. This is because we could not check on the dose that the left ectopic kidney was going to receive knowing that it should be kept within a mean tolerance dose of 15–18Gy.

The case report by Moaiery and Rasouli reports that treating a patient with cancer of the rectum with pelvic kidney is a possible option as this patient never had a major side effects and the functioning of the kidney post-treatment was normal [4]. It should be noted, however, that using the 2D treatment technique, which is even more challenging as we do not have the actual doses to the ectopic kidney and other organs at risk. In our case, the generous coverage of the left kidney may also compromise on the treatment outcome and overall survival of the patient as the pelvic nodes and possible microscopic tumor extent on the left may not receive sufficient dose. The outcome of advanced treatment technics such as the use of IMRT compared to 3DCRT produces even less acute toxicities [3].

In another case report involving a cervical cancer patient with a transplanted pelvic kidney, irradiation of up to 59.4 Gy was given using IMRT. This achieved better tumor control and less toxicity to the kidney showing that higher radiotherapy dose through advanced techniques like IMRT is possible and better in such cases [7]. A case reported by Bokhari *et al*. on locally advanced rectal cancer with pelvic kidney complicating adjuvant radiation therapy showed that the generous blocking of the tumor leads to early pelvic recurrence and distant metastasis. The inadequate surgery of not doing an extended lymph node dissection also contributed to the poor outcomes, as 13 of 16 regional lymph nodes were positive [8].

CONCLUSION

Looking at our 2D treatment plan with generous shielding, one can say pelvic radiotherapy using the 2D treatment technique that can be sufficient in the management of such a phenomenon. It is difficult to however definitely conclude on the outcome of such treatment as they are a number of factors to look at such as total dose to blocked areas and also on the extent of kidney injury that may occur.

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