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Research Article

Monitoring of Patients Treated with Radiation Therapy for Breast Cancer

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Abstract

Breast cancer is the most common female cancer. Among the therapeutic arsenal in the management of breast cancer, radiotherapy occupies a prominent place. Its indication is systematic toa conservative surgery of an invasive breast cancer or a carcinome in situ breast. However, after radical mastectomy-type surgery, radiation therapy depends on certain factors of poor prognosis. After the treatment of breast cancers with radiotherapy, monitoring is an important stage in life after irradiation because it can either detect and treat the late effects of irradiation, detect and treat a possible tumor recurrence early, or reassure patients of the possibility of complete remission or cure. Post-radiotherapy monitoring is clinical, biological and radiological.

It was a good opportunity for us to take stock of the surveillance of patients with radiotherapy at the University Hospital Centre (CHU) in Brazzaville and abroad for breast cancer.

Keywords: Surveillance; Radiation Therapy; Cancer; Breast; Treatment

Introduction

Breast cancer currently ranks first among women. After conservative surgery for invasive breast cancer or breast in situ carcinoma, adjuvant radiotherapy is routine. However, after radical mastectomy-type surgery, adjuvant radiation therapy depends on poor prognosis factors including tumor size, lymph node invasion, exeresis limits, vascular embolisms etc. [1,2]. Radiation therapy in breast cancers reduces the frequency of local recurrences, thus ensuring locoregional control of the disease, increases survival and improves the quality of life of patients [1]. After the treatment of breast cancers with radiotherapy, surveillance is an important stage of life after irradiation because it can either detect and treat the acute and especially late effects of irradiation, or detect and treat early a possible tumor recurrence, or reassure patients of the possibility of complete remission or cure.

Post-radiotherapy monitoring is clinical, biological and radiological.

It was a good opportunity for us to take stock of the surveillance of patients with radiotherapy at the University Hospital Centre (CHU) in Brazzaville and abroad for breast cancer.

Patients and Methods

We undertook a descriptive retrospective study in the hers of heraldic radio and medical oncology at the University Hospital of

Brazzaville (CHUB), in January 2014 and December 2020. To be included in the study, patients had to meet the following criteria: -having histological confirmation of the diagnosis of breast cancer; Have received radiation therapy at THE CHUB or abroad; Have a medical report confirming the effectiveness of radiation therapy; Have the biological and medical imaging check-ups required during the tests. The patients were referred for radiotherapy by the medical oncology, gynecology and obstetrics and radiology departments of the Brazzaville University Hospital. All patients had received radiation therapy at the CHUB or abroad and had a medical report signed by a radiotherapist. For patients treated at the Brazzaville Iversitary Hospital, the radio theist received was conventional cobalt therapy with a Theratron 780C brand device. This device is equipped with a Cobalt 60 radioactive source that emits gamma radiation with an average energy of 1.25 MeV. The irradiation technique allowed patients to be installed in dorsal decubitus on an incline to bring the pre-sternal region horizontally. The arm on the affected side was placed in 90 degree abduction and held by an armrest and the patient's head tilted on the opposite side of the treated breast. Other patients, on the other hand, had received conformational radiotherapy through a linear particle accelerator abroad. The mastectomy-induced mastectomy had received curative radiotherapy at the total dose of 50 grays in 25 sessions by two tangential beams (internal and external) on the chest wall of the side reached incluating the surgical scar, with or without irradiation at the above-clavicular or axillary lymph node areas. On the other hand, patients who had received breast preservation received a boost (irradiation supplement) of 16 grays on the tumor bed in addition to breast irradiation of 50 grays on the affected breast. Splitting was classic (5 weekly sessions of 2 grays per session) with an average spread of 35 days. The radiotherapy monitoring schedule follows certain rules governed by learned societies and radiotherapy repositories.

After breast cancer irradiation, patients are consulted immediately within one week of the radiotherapy sessions to prepare the end-of-treatment medical report and explain the pace of testing for the next five years.

Patients will be reviewed by the radiation oncologist every three months for two years and then every six months for three years, and finally annually beyond five years of follow-up.

Monitoring is clinical, biological and radiological.

Clinically, it is a matter of thorough examination and clinical examination to look for signs of possible local breast recurrence or on the chest wall, axillary or overt clavicular lymph node disease, a new suspicious lesion of recent onset, but also to detect and treat the appearance of acute and especially late side effects of radiotherapy. On the biology level, monitoring consists of carefully monitoring the kinetic values of certain tumor markers including CA15-3 once a quarter, even though it has become optional at present, and now only asks in case of clinical suspicion of a progression of the disease.

From a radiological point of view, the conduct of the examinations is also not systematic. In case of call signs and depending on the suspected organ, a CT scan and/or magnetic resonance imaging(MRI) and/or bone scan and/or PET-Scan may be requested. In our context where all these examinations are not available, we often limit ourselves to carrying out standard x-rays and organ ultrasounds, at best a CT scan.

However, in the case of breast preservation, a mammogram coupled with bilateral breast ultrasound is recommended once a year. In general, the first tests after radiation therapy for breast cancer will be performed at least three months or so near the end of radiation therapy. The Graph pad Prism 5 software was used to calculate the spread and compare our data with those of the literature.

Results

During the study period, 96 patients treated with radiation therapy for cancer of the sein were recorded. The average age was 41 years before extremes ranging from 22 to 70 years. The most common histological type was nonspecific infiltrating carcinoma. Patients were classified according to the TNM classification (Table 1). Acute side effects after irradiation were observed in 48 patients, while late side effects beyond six months after the herald ion were observed in 26 patients. The different types of side effects observed during the surveillance were illustrated in figure 1 and 2 and the therapeutic response observed and the examinations performed during surveillance are illustrated in figure 3 and 4. Patient monitoring was carried out according to the standard follow-up schedule for patients treated with radiotherapy.

Age ranges (years)	T2N1M0	T2N2M0	T3N2M0	T4aN1M0	T4bN2M0	Total
20 - 30	8	4	3	1		16
31 - 40	12	6	7			29
41 - 50	20	5	3	3	4	31
51 - 60	4	5			3	12
61 - 70	2		3	2	1	8
Total	46	20	16	6	8	96

Table 1: Patient breakdown by age and TNM stage.

Figure 1: Acute side effects during surveillance.

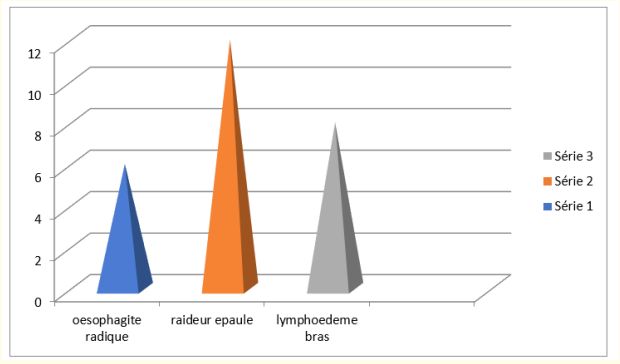

Figure 2: Late side effects during surveillance.

Figure 3: Therapeutic response observed during surveillance.

Reviews conducted during surveillance

Figure 4: Different reviews conducted during surveillance.

IRM	Scanner	Mammography	Ultrasound	Osseuse scintigraphy	Pet scan
4	12	11	42	6	1

Table 2

Discussion

The success of radiation therapy depends mainly on the total dose delivered in a homogeneous manner at the level of the tumour because it will ensure local control but also the protection of the so-called at-risk neighbourhood organs. However, the delivery of this dose is limited by the tolerance of healthy tissues in the volume irradiated. The preservation of the quality of healthy tissues is therefore a major concern for the radiotherapist and must be integrated into the daily management and follow-up of patients. The time it takes for secondary lesions to occur depends solely on the lifespan of mature cells. The duration of functional recovery is determined by the severity of stem cell depletion, itself resulting from the dose received [1,2].

Acute reactions appear in fast-renewing tissues such as the skin. If the radiation dose is high enough to kill all stem cells, cell regeneration depends on the migration of stem cells from adjacent, unradiated tissue regions. In this case, the volume or the irradiated surface influences the severity and duration of acute toxicities. Cicatrisation occurs by re-epithelizing from the surviving cell islands of the basal layer. Early lesions of the epidermis are low in dose per session but are highly influenced by sprawl due to cell repopulation. Treatment of acute side effects depends on the grades or extent of the lesion. For example, for grade 1 and 2 lesions, the application of watery Eosine is recommended after the radiation therapy session and then in the evening at bedtime. All patients irradiated in our series with acute side effects were treated with watery Eosine. Apart from complications directly related to surgical action (seroma, scarring over infection) or radiotherapy (radio-dermatitis), two particular chronic situations are common: -Post-surgical or/and post-radial pain, sometimes reactivated during breast reconstruction, is one of the main causes of disability insurance claims. They can sometimes be rheumatological or neurogenic for multidisciplinary management (physiotherapy, pain consultation, psychiatrist, rheumatologist and neurologist).

Arm lymphedema is less common since the routine use of the sentinel node technique, which often allows for a stay of axillary curage. The therapeutic means remain disappointing: lymphatic drainages and wearing a compressive sleeve are the only proposals to offer. Patients will avoid any trauma (including blood and blood) of the arm that may precipitate lymphedema(18,20). The cobalt therapy used in our study, a type of machine although old, is nevertheless indicated in breast cancers and gives interesting results with tolerable side effects. The acquisition of a linear accelerator to replace the cobalt therapy device at the University Hospital Center of Brazzaville, will certainly minimize the acute toxicities observed in our patients and improve the quality of life of our irradiated patients. The advent of linear accelerators has significantly improved the treatment of breast cancers by radiotherapy. Indeed, the most common technique is the use of the two opposite tangential faiseals [1]. With the cobalt therapy device, both beams are treated in DSP (distance source skin), the center being different for each of these beams. However, with a particle accelerator, a single center is used for both beams (we speak of an isocentric technique). This technique greatly advantages over accuracy (both beams are treated one after the other) and time saving (patient stays less time on the machine table during sessions). Second, the new techniques minimize the side effects usually associated with cobalt therapy [1]. Note that even with the new technologies, radio epithelites as side effects are found. These effects disappear after three weeks after applying a local treatment. During the monitoring, 48 patients had developed acute side effects. Grade1 radiodermitis was the most common acute side effect seen in 22 patients, followed by breast pain (12 cases), chest wall pain (10 cases) and physical asthenia (04 cases). They had benefited from the same local treatments in the management of these so-called side effects and the results were satisfactory. As for late side effects, they were found in 26 patients with predominance on shoulder stiffness [13], followed by homolateral arm lymphoedism (08) and radial esophagitis (06). Monitoring patients treated for radiation therapy is an important step in the process of complete remission or recovery. It relies on the clinic, biology and medical imaging.

Clinically, it is a matter of thorough examination and clinical examination to look for signs of possible local breast recurrence or

on the chest wall, axillary or clavicular lymph node disease, a new suspicious lesion of recent onset, but also to detect and treat the onset of acute and late side effects of radiotherapy [19,22]. Biologically, optional monitoring consists of carefully following the kinetic values of certain tumor markers including CA15-3 annually, and now only asks in case of clinical suspicion of disease progression.

From a radiological point of view, the conduct of the examinations is also not systematic. In case of call signs and depending on the suspected organ, a magnetic resonance imaging (MRI) scan and/or bone scan and/or PET-Scan may be requested. In our context where all these examinations are not available, we often limit ourselves to carrying out standard x-rays and organ ultrasounds. In general, the examinations after radiation therapy for breast cancer will be carried out at least three months after the end of the radiotherapy and then according to the standard schedule of follow-up therapy [1-22].

Conclusion

After radiation therapy for breast cancer, monitoring is a crucial period of follow-up of patients to anticipate certain situations in order to increase the overall survival of patients. Follow-up, closer in the first two years after radiation therapy for breast cancer, should always include maintenance and clinical examination. It helps to help detect recurrences, second tumours and toxicities related to treatment. A mammogram and breast ultrasound are recommended annually. The onset of symptoms in consultation intervals requires rapid management, possibly supplemented by biological and/or radiological investigations to enable early detection of recurrence and the introduction of therapeutics.

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