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RESEARCH ARTICLE

COMPLETE RESPONSE AFTER HYPOFRACTIONATEDRADIOTHERAPY TREATMENT OF A RECURRENT CUTANEOUS SQUAMOUS CELL CARCINOMA OF THE AMPUTATED FINGER

Kaoutar Soussy[1]*, Bouthaina Assenhaji[1], Mehdi Sadiki[2], Mohamed Ait Erraisse[1], Wissal Hassani[1], Zenab Alami[1], Fatima Zahra Farhane[1] and Touria Bouhafa[1]

1. Radiation Oncology Department, Oncology Hospital, Hassan II University Hospital. Fes, Morocco.
2. Medical Physics Unit, Hassan II University Hospital, Fes, Morocco.

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Abstract

Cutaneous squamous cell carcinoma is a relatively uncommon type of skin cancer that occurs most frequently on the hands. An 84-year-oldright-handedwomenpresented a recurrent cSCC of the 3rd finger four months following amputation and after declining adjuvant radiotherapy indicated given insufficient limits. Salvage hypofractionated Radiotherapy was performed with the 3D technique (60 Gy of RT in 20 fractions, at a daily dose fraction of 3 Gy over four weeks), with complete response and good aesthetic results.

Introduction:-

Cutaneous squamous cell carcinoma (cSCC) is the second most common skin cancer in the world(1) and makes up approximately 20%of all skin cancers; it is oftenlocated in areas of intense ultraviolet light or sun exposure(2).

The hand and upper extremities are at risk of cSCC development; however, it is most often found onthe head and neck(3).

For most cancers, including cutaneousBCCs and SCCs, conventional fractionation (i.e. at 2 Gy per day) has long been considered astandard approach that reduces long-term toxicity rates while maintaining a low rate of localrecurrence(4).Multiple fractionation options exist for small, localized, thin skin tumors, rangingfrom 6.5 weeks of conventional fractions (64 Gy in 32 fractions) to the extremehypofractionation of 20 Gy in a single fraction; hypofractionated approaches are oftenchosen for superficial skin tumors in order to maximize convenience(5).

We report a case of a complete response after hypofractionated radiotherapy treatment of a recurrent cutaneous squamous cell carcinoma of the amputated fingeras well as a review of the literature.

The case:

Our patient is a right-handed84-year-old women with no pathological history. She presented a year before her consultation in our department a 5mm papule on the back of the middle finger of her right hand progressively increasing in size.

She consulted at the dermatology and orthopaedics departments of the University Hospital HASSAN II of Fes. Clinical examination found a budding lesion onthe back of the middle finger (Figure 1). A biopsy was performed, an X-ray of the hand and lymph nodes ultrasound wererequested.

Corresponding Author:- Kaoutar Soussy
Address:- Radiation Oncology Department, Oncology Hospital, Hassan II University Hospital. Fes, Morocco.

Figure 1:- Clinical image of the back of our case's right hand showing the tumour on the middle finger.

The X-ray showed a periosteal reaction with suspected infiltration of the proximal phalange. Lymph nodes ultrasound was normal.

The biopsy of the tumour revealed awell differentiatedmature and infiltratingSquamous cell carcinoma. The case was discussed in the MDT board with the decision of an upfront surgery. The patient underwent surgery that consisted of a thirdfinger amputation.

The pathology report of the surgical specimen confirmed the diagnosis of InfiltratingcSCC; and the bone resection limits wereinsufficient.

Given the pathology results, adjuvant radiotherapy was indicated in the MDT board.

After complete healing of the wound,the patient refused the radiotherapy treatment. However, four months after the resection, the patient presented to our department with a progression of the disease in the surgical wound (figure 2).The case was re-discussed in the MDT board and decision was a definitive radiotherapy.

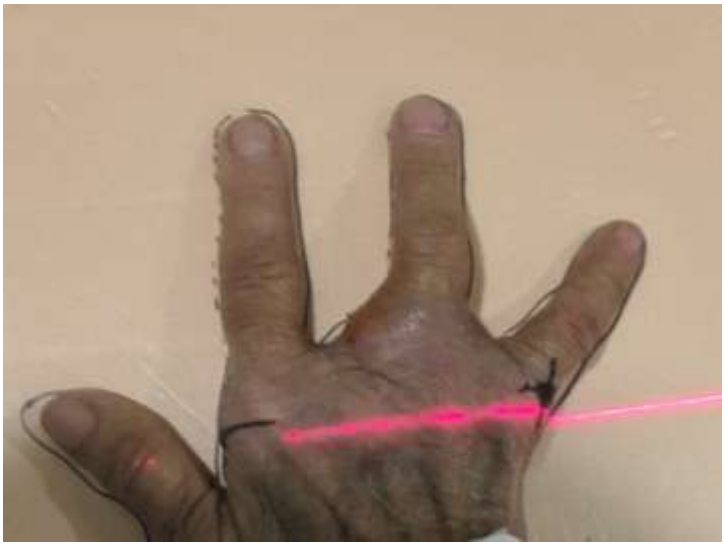

Figure 2:- Clinical image of the back of our case's right-hand showing tumour progression within the surgical wound.

She was planned for a hypofractionated radiotherapy with a total dose of 60Gy of RT in 20 fractions, at a daily dose fraction of 3Gy over four weeks (EQD2=65Gy with α/β of 10 BED_{10}=78Gy and BED_3=120Gy),using3DRT techniquewith two fields (anterior and posterior) and one cm bolus. We were able to deliver the intended dose of radiation to the target volume (figure 3).

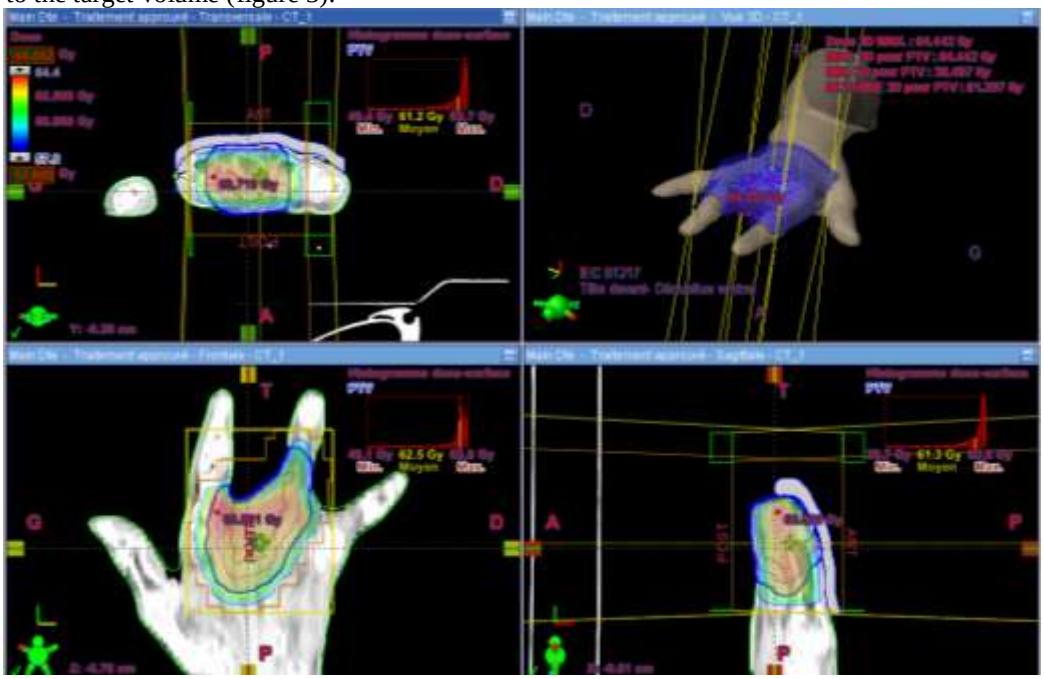

Figure 3:- Disposition of 3DRT beams on the three plans and showing the 95% isodose conforming to the PTV (axial, sagittal and coronal).

She was able to receive her RT as planned, and was seen weekly with good tolerance and no side effects.

Overtwo yearsof follow-up, the patient was seen every 3 months for a clinical examination and imaging(X-Ray and lymph nodes ultrasound)every 6 months without no evidence of disease (figure 4).

Figure 4:- Clinical images of the back of our case's right-hand showing the complete response and the cosmetic results after 2 years follow up.

Discussion:-

The incidence of nonmelanoma skin cancer is increasing globally, with the highest rate occurring in Australian and New Zealand patients(6).

cSCC is actually the most frequent primary malignant tumour of the hand, although it is still rarely encountered (7).

Risk factors include fair skin, cumulative over-exposure to ultraviolet radiation, advancing age, outdoor vocation, and sunnier geographic locations. Other causesinclude arsenic exposure, chronically damaged skin (from burn scars), human papillomavirus infection, and polyaromatic hydrocarbon exposures(2).

For the management of these tumours, the options available include surgery, topical applications or radiotherapy (RT). All modalities of treatment have a high rate of success. Treatment options are determined by factors such as a patient's age and performance status, surgical contraindications and tumour type/location(8).

With disadvantages including the invasive nature of surgery, possibility of hospitalisation and general anaesthesia, re-operation for margin positivity may be disfiguring in functional or cosmetically sensitive areas(6).

In general, a recommendation of definitive RT is reserved where surgery is not feasible (e.g. poor performance patient, likelihood of positive margins, patient refusal), or where surgery could result in unacceptable functional morbidity(6).

In a large retrospective study of 434 epithelial skin cancers data by M. van Hezewijk et al (9); two fractionation schedules (44 Gy in 10 fractions and 54 Gy in 18 fractions) for electron beam irradiation of epithelial skin cancer were evaluated. They conclude that electron beam irradiation is a safe and effective treatment modality for epithelial skin cancer.

However, as skin has relatively few radiosensitive structures and the capacity to regenerate itself, it is often preferable in superficial fields of cancer to use a hypofractionated approach.Current dogma states that a shorter treatment time results in worse cosmesis, but there is little evidence to support this claim. Furthermore, extended treatment duration may be inconvenient for elderly patients and not cost effective.(5).

Zaorsky et al. (5)describe in a meta-analysis of Hypofractionated radiation therapy for basal and squamouscell skin cancer that Hypofractionated RT has favourablecosmesis for patients with skin BCCs/SCCs. They recommended that clinicians consider these commonly used regimens, which all have BED_3 of ~100 Gy: 50 Gy / 15 fractions, 36.75 Gy / 7 fractions, or 35 Gy / 5 fractions, as they result in "good" cosmesis in 80% of patients.

Conclusion:-

Hypofractionated RT has a favourable cosmetic outcome for patients with skin SCC, mainly for elderly patients and cosmetically sensitive areas such as the hand and fingers, and for whom surgery is less favourable, especially if residual or recurrent disease is identified, which was the case for our patient.

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