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RESEARCH ARTICLE

SKIN SURFACE BRACHYTHERAPY FOR CUTANEOUS T LYMPHOMA: CASE REPORT AND REVIEW OF LITERATURE

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Abstract

Cutaneous T cell lymphomas (CTCLs) are a heterogeneous group of extranodal non-Hodgkin's lymphomas that are characterized by a cutaneous infiltration of malignant monoclonal T lymphocytes.At the early stages, CTCLs are often misdiagnosed as benign skin conditions and the treatment is still not well codified. We report the diagnostic and therapeutic path of a case of cutaneous anaplastic large celllymphoma located in the left forearm treated by skin surface brachytherapy(SS-BT) in theRadiotherapy-Brachytherapy department of the HASSANII university hospital center in FES. In our patient; SS-BT provided us an excellent local control andgood cosmetic results.

Introduction:-

Anaplastic large cell lymphoma is a form of cutaneous T-cell lymphoma characterized by the presence of anaplastic, pleomorphic or immunoblastic tumor cells expressing for the majority of them (more than 75%) the CD30 antigen. It presents in the form of single or multiple localized nodules or in the form of plaques. The initial stage of management consists in distinguishing a strictly cutaneous lymphoma from a secondary cutaneous systemic lymphoma. Treatment is based on clinical monitoring, radiotherapy, surgical excision and chemotherapy in case of disseminated lymphoma or extracutaneous locations.[1]

We report a case of cutaneous T lymphoma of the left arm treated with Skin Surface Brachytherapy (SS-BT) as well as a review of the literature

Case Report:

Our patient is a 42-year-old women , pregnant at 21 weeks, with no relevant medical history , who presented anaplastic large T-cell lymphoma CD 30+ ALK- evolving for 10 months in whom the clinical dermatological examination showed the presence of a budding flesh-colored tumor measuring six centimeters long axis of firm consistency with a crusty surface and infiltrated base sitting at the level of the left external face of the lower third of the left arm , with no lymphadenopathy .(Figure 1 , A).

Complete blood count with differential, comprehensive metabolic panel, lactate dehydrogenase, and HIV testing were performed to rule out systemic involvement and immunological compromise; the results were all normal. The patient had a computerized tomography of the chest and an abdominal-pelvic echography with no evidence of

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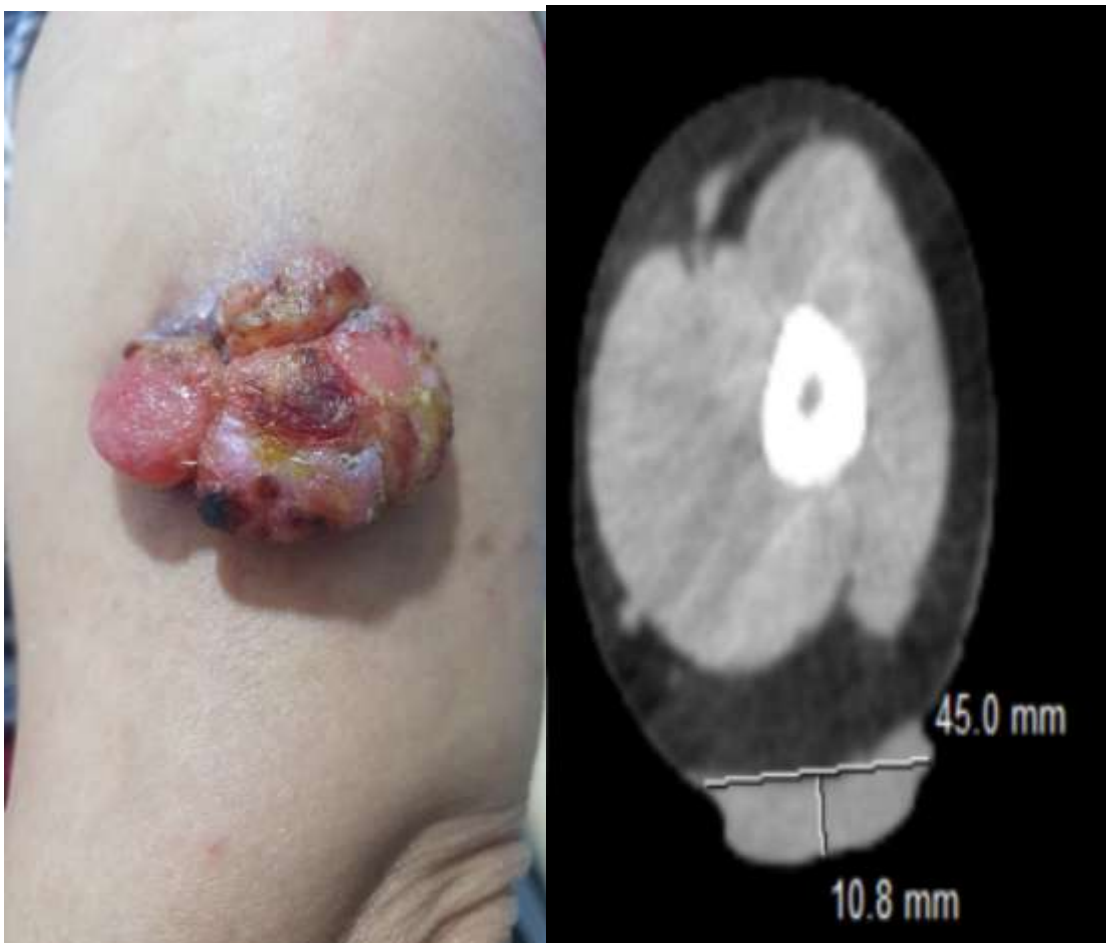
distant metastasis , but showed an infiltration of cutaneous tissue on the posterior wall of the left forearm(Figure 1 , B) .The tumor was classified T1N0M0, stage Ib according to theClassification EORTC/ISCL cutaneous T-cell lymphoma type MF/SS.

The case was discussed in the MDT board with the decision of an upfront surgery since the patient refused medical interruption of pregnancy and any systemic treatment. Surgical excision was performed under localized anesthesia with 1 cm margins. (Figure 2)



(A) (B)

Figure1:- A :Clinical image of the external side of the patient's left arm showing the lesion
B : CT scan image of the skin lesionbefore the surgery

The patient did not return for follow-up until she gave birth.

The case was re-discussed in the MDT board and the decision was: adjuvant radiotherapy on the excisionsite (following a computerized tomographyscan (CT) of the chest and abdomen, with no evidence of distant metastasis).

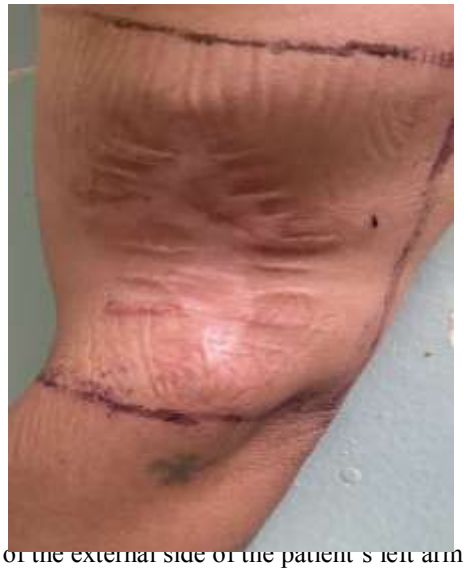


Figure 2:- Clinical image of the external side of the patient's left arm with the surgical wound

Our patient received high dose rate skin surface brachytherapy (HDR SS-BT) with a total dose of 15 Gray in 5 fractions, 5 Gray/fraction , 1 fraction per 2 days.

The application was made by a catheter flap Set type applicator by the Gamma Medplus machine from Varian (figure 3).

Figure 3:- The catheter flap set and thermoplastic mask.

It is designed to create a defined space between source and tissue, and between source channels. The highly flexible material easily adapts to complex anatomical shapes. The catheter channels have a diameter of 2 mm and are positioned on the median axis of the flap with a bolus of 5 mm.

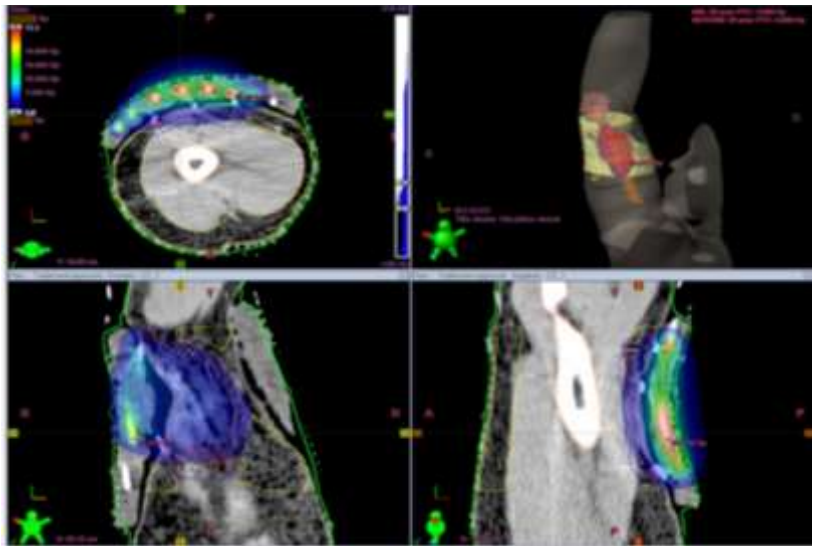
The catheter flap is often affixed to a Thermoplastic Mask (TM), commonly used in radiation therapy, to maintain a reproducible orientation relative to the patient's anatomy. The TM material was heated and formed around the patient's left arm . The catheter was attached to the TM. This TM design and the position of the Flap catheter allowed the Ir-192 HDR source to travel in close proximity to the skin tissue to be treated.

During the planning scanner, the correct positioning of the material with the applicator was checked in order to avoid misplacement, Planning based on three-dimensional Computed Tomography (CT) was performed using 1.5 mm CT sections of thickness, Images were imported into Eclipse (Varian Medical Systems, Palo Alto, CA).

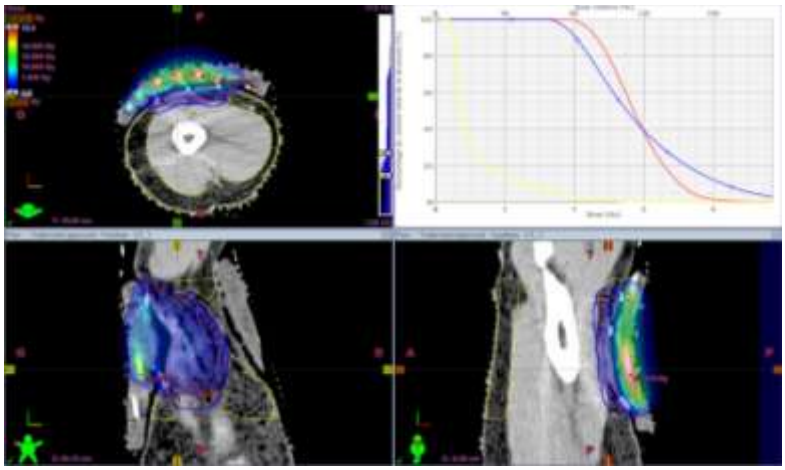
The Planning Treatment Volume (PTV) was described or "Contoured" on the CT images .

The patient received treatment according to plan and tolerance was good. Treatment Planning (TPS) was performed on the VARIAN Gamma Medplus machine.

The plan was evaluated using the slice-by-slice visualization. The technique at the time of this treatment was to prescribe at the skin surface and cover the treatment volume with the90 %isodose line.The dose was prescribed at a depth of three millimeters.



A



B.

Figure 3:- A :Brachytherapy treatment planning and dose-volume histogram
B: Brachytherapy treatment planning computed tomography showing dose distribution

Our patient presented a grade III radiodermatitis two weeks after SS-BT, treated with local wound management .

With an average of one year follow-up our patient is still alive , with no evidence of disease or recurrence and good aesthetic results .

Discussion:-

Primary cutaneous lymphomas (PCL) are clonal proliferations of mature B or T lymphocytes, localized to the skin, with no evidence for extra-cutaneous localization at the time of diagnosis. After digestive lymphomas, they constitute the second site of extra-nodal lymphomas. These are rare pathologies whose incidence seems to be increasing. [2]

Primary cutaneous T-cell lymphomas (LCP T) represent a heterogeneous group of neoplasms derived from skin T lymphocytes. Besides MF (muscosisfungoide), cutaneous CD30+ primary lymphoproliferative disorders are the most common group of PCL T accounting for approximately 30% of cases. [3]

To diagnose Cutaneous T-Cell Lymphomas , guidelines prepared by the National Comprehensive Cancer Network (NCCN) recommend biopsy of suspicious skin sites and subsequent assessment in terms of dermatopathology, immunohistochemistry, and molecular analysis (TCR gene rearrangement) [4].

Magnetic resonance imaging (MRI) or computed tomography (CT) scan is used to investigate nodal and systemic involvement[6][8].Fluorine-18 fluorodeoxyglucose positron emission tomography-CT (18F-FDG PET-CT) can determine cutaneous and extracutaneous lesions in CTCLs, response to therapy, and disease recurrence. In comparison with CT scan, this modality is more sensitive and specific in detecting both cutaneous and extracutaneous involvement, particularly in determining lymph node involvement [6].

Therapeutic options for CTCL encompass a broad spectrum of regimens, including skin-directed therapies for early-stage disease and systemic therapies for advanced-stage disease. Multiple treatments are available and can be used alone or in combinationwith the aim of maximizing the chances of complete remission while preserving immunity, since the anti-tumor immune response is a factor naturally limiting the progression of CTCL:

1. Local skin treatments: topical corticosteroids, carmustine, mechlorethamine, radiotherapy, electron baths, phototherapy (PUVA).
2. Modulators of the biological response: extracorporeal photopheresis, interferon alpha, interferon gamma, retinoids (acitretin Néotigason®, bexarotene Targretin®).
3. Cytostatics.

In terms of treatment, there are no international guidelines for the treatment of cALGC but only broadly similar recommendations from the French expert group, from the expertise of the members of the European Organization for Research and Treatment of Cancer (EORTC), from the International Society for Cutaneous Lymphoma (ISCL) and the Cutaneous Lymphoma in the United States Consortium taken up by Kempf et al in a review of the literature.

The group of French experts recommends abstention coupled with monitoring in the event of spontaneous regression. Then if the lesions are non-regressive, unique or localized, surgical excision or radiotherapy are recommended, with disease-related survival rates of over 90%.

Surgical excision as initial treatment is the most common approach, used in 19-57% of patients. No information was provided regarding response rate or excision margins. Relapses occur in 43% of patients, within 2 to 76 months. [9]

Radiotherapy is used as the first line for cALGC in 48% of patients. The radiation dose ranges from 30 to 46 Gy with a median diameter of the lesional region of 3 cm and a margin of 2 to 3 cm of perilesional skin. Mild and transient side effects are observed. There are 95% complete remissions. Recurrences are observed in 41% of patients. A recurrence-free period until the first relapse is about 34 months. [10].

Lymphocytes are sensitive to radiation therapy. In more advanced cases, radiation therapy to local lesions or to the entire skin can control disease. For cases with a single lesion, this modality can be curative [11][12]. Electron beam radiation therapy (EBRT) is effective in treating CTCLs [11][13][14]in stages I to III [11], [15]. Whole-body total skin electron beam is an appropriate modality for more advanced cases [11], [15], [16].Complete response rate is lower in tumor-stage disease in comparison with plaque-stage cases (36% versus 98.3%)[13].

Skin surface Brachytherapy is noninvasive and ideal for delivering tumoricidal doses of radiotherapy to superficial lesions while limiting unfavorable delivery of radiation to healthy tissues due to rapid dose fall-off at the periphery of the lesions.The Catheter Flap in SS-BT, is designed to allow the HDR Ir-192 source to travel approximately 5 mm from the skin surface.

This technique is especially desirable when treating anatomic sites that are near tissues vulnerable to irradiation or that present significant cosmetic challenges to surgical excision such as the scalp, face, and hands[18].

There are few reports utilizing brachytherapy for CTCL [19]. DeSimone, et al. reported on 10 patients with facial mycosis fungoides lesions that were successfully treated with HDR brachytherapy doses of 8 Gy in 2 fractions of 4 Gy. There were no recurrences in the median 6-month follow-up period[20] . Goddard AL, et al. [21]presented a case seriesutilizing HDR brachytherapy for the treatment of acral CTCL .

Unlike its nodal counterpart, anaplastic large cell lymphoma(cALGC) has a favorable prognosis with five-year survival rates ranging between 76% and 96%. Spontaneous regression of the tumor, partial or complete, is observed in 23% to 44% of cases after a median period of 2 months (1 week to 6 months). The disease recurs in the skin in 39% of cases.

However, progression to systemic disease is rare and affects only 12 to 16% of patients.

For all ALK+ cLAGCs, long-term monitoring is recommended as extracutaneous dissemination was reported 96 months after diagnosis in a recent meta-analysis.[10].Monitoring by positron emission tomography (PET) is recommended every 3 months for the first two years, then every 6 months for the next 3 years and then every year, in accordance with the recommendations of international workshops sponsored by the National Cancer Institute. .

Whether patients with extensive limb disease should be treated differently from those with localized cALGC remains unclear as some recent studies have indicated a poorer prognosis. [10]

Following these observations, it is therefore recommended that the treatment of cALGC be adapted to the size and extent of the lesions.

Conclusion:-

In conclusion, to date, it is recommended to treat localized cALGC as first-line treatment by surgical excision and/or radiotherapy, while the first-line treatment for multifocal lesions is low-dose methotrexate followed by bexarotene. In view of the few observations described to date, it is important to report each new case of cALGC ALK+ in order to reinforce the current recommendations which are still vague.

Consent:

The examination of the patient was conducted according to the Declaration of Helsinki principles.

Conflicts of interest:

The authors do not declare any conflict of interest

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