

Brachytherapy for Face, Neck Basal Cell Carcinoma.

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Abstract

Purpose: Treatment of Basal cell carcinomas by Radiotherapy carries Equal results with advantage of cosmesis and can avoid surgical complications. External Beam Radiotherapy (EBRT) will last for 6-8 weeks duration. Feasibility of High Dose Rate (HDR) brachytherapy is an alternative to EBRT which is highly effective, which will reduce treatment time and cheaper one which can be practiced in a centre without Multi-energy Linac facilities, good mould room facilities.

Methods & material: Interstitial implantation was done and HDR after loading tubes were placed as per tumor volume. After simulation, with the help of simulation check films, treatment is planned with PLATO Treatment Planning System (TPS) and optimization was done.

Results: We treated fifteen cases of Basal cell carcinomas of the face and nape of neck by High Dose Rate (HDR) brachytherapy. Total dose of 42-45 Gy in 14-15 fractions with 3 Gy per fraction (#), 2# per day with a gap of minimum 6 hours between two fractions... All the patients have complete response and none of the patient have relapse.

Conclusion: Basal cell carcinomas of face and nape of the neck can be treated with High Dose Rate (HDR) brachytherapy will shorten overall duration of treatment time with excellent local control and toxicities as comparable with External Beam Radiotherapy (EBRT).

Keywords: basal cell carcinoma of the face and neck, brachytherapy.

I. Introduction

Basal cell carcinomas is one of the skin cancer, which account for <0.5% all cancers at M.N.J. Institute of Oncology & RCC, Redhills, Hyderabad, India. The basal cell carcinomas are locally malignant and they do not metastasize to regional lymph nodes. One of the treatment options is surgery, when they were resectable. The surgery will be in the form of excision, cryosurgery, or MOH's microsurgery(1). Surgery will be the best option, when we can get adequate margins for wound closure after resection of the tumor to achieve better cosmetic results. Surgery in basal cell carcinomas will be best suited when the underlying bone is involved or previous scar carcinomas and recurrent tumors at the already irradiated sites. In these situations, surgery including plastic and reconstructive surgery will be a better option. In some situations where the tumor is situated in areas like inner canthus of the eye, lower eye lid, nose and nasolabial fold, retroauricular area and ear, surgical approach will be difficult as it is difficult to achieve adequate margin and there by cosmesis. These patients always require reconstructive surgery by a plastic surgeon and the results will not be better than that of radiotherapy. The other option of treatment is by Radiotherapy as these tumors were radio responsive (2,3). Radiotherapy will be in the form of External Beam Radiotherapy (EBRT), best treated by electrons, where multi energy Linear accelerator facilities were available. These tumors were easily accessible to vision, there by early diagnosis and treatment. EBRT will give excellent results but it will carry longer duration of treatment and multiple visits to the hospital. Brachytherapy is a practical mode of treatment and a good alternative to EBRT to the patients, where we can avoid multiple visits and prolonged duration of overall treatment duration. Superficial cancers were treated by Iridium (Ir) 192 interstitial brachytherapy (4,5) or with mould brachytherapy with gamma ray emitters (6).

Now a days, the present HDR brachytherapy machine using a source usually Iridium (Ir) 192 with few mm length and < 1mm diameter and with high activity(7). High Dose Rate (HDR) brachytherapy equipments were accompanied by Treatment Planning System (TPS), calculation of dose distribution and optimization for individual cases(8,9, and 10). There by quality assurance and precision planning.

In the present article, we are describing a custom made low cost HDR brachytherapy treatment technique useful in the treatment of 15 patients with basal cell carcinomas of the face and one case of nape of neck were summarized.

II. Materials and Methods

We treated total 15 patients with basal cell carcinomas of the face and one case of nape of neck between 2005 and 2009 at M.N.J. Institute of Oncology & RCC, Redhills, Hyderabad, A.P, India . They were followed up to 2011. Now the results were analyzed retrospectively.

The patients with histopathologically proved Basal cell carcinoma of the face and nape of neck were selected. The selected patients were referred from surgery when the patients were inoperable due to inability to obtain adequate margins or when the patients refuse surgical intervention. After clinical examination, Base line blood investigations and CXR was carried out. The implant procedure was carried out under local or under anesthesia . After preparation of the part with antiseptic solutions, the proposed implant needle position was marked on the skin. HDR source 17 gauge needles were inserted on the skin surface. The flexible interstitial brachytherapy catheters were at 0.8 to 1 cm apart based on the tumor size and with treatment which were parallel to each other (Fig 1,2). Before and after placing the catheters, dummy source checks were carried out to know the patency of the catheters. Once the patient recovers from anesthesia, patient is taken up for simulation to check exact position of tubes at the tumor site.

The patients were simulated with dummy sources in the plastic implant tubes with lead marker on the tumor.. Orthogonal check films were taken with dummy sources (Fig 3,4). The data was transferred to treatment Planning System(TPS). Target volume is defined Treatment. Planning and optimization was done with plato treatment planning system (Fig 5). Eighty five percent isodose was prescribed for volume prescription. After obtaining appropriate optimal plan, the data is transferred to High Dose Rate(HDR) brachytherapy machine. The patients were treated with a total dose of 42-45Gy/14-15Fractions ,with 3 Gy per fractions with 2 fractions per day with minimum interval between two fractions was 6 hours(11,12,13). The Severity of radiation reactions were recorded during treatment and after completion of treatment. During Radiotherapy, patients were kept on mouth gargles and prophylactic oral antibiotics . Total number of 15 patients were treated. The minimum follow up period was two years and maximum follow up period was five years.

III. Results

We treated 15 cases of Basal cell carcinoma, of which 14 on the face and one on the nape and lateral side of neck with Iridium 192 HDR brachytherapy. Out of which 11 patients were males and 4 patients were females. The age was between 29 years to 70 years. All the lesions were on the face except the one, which is present on the nape of the neck.

The clinical presentation was, the nodular ulcerative type consists of majority of the lesions which were 10/15 patients, nodular lesions were 1/15 and superficial type was 3/15 patients(Table no 1). Each three cases in Ala of nose, Antral region. Two each cases in Tip of the nose, Lower eye lid and Medial and lateral canthus of the eye . One patient had lesion in the Nape of the neck ,who is a youngest patient of 29 years old with albinism(Table no 2).

The patients were followed up for every 2 month in the first year, every 3-4 months during second year, every 6 months during third year and there after every year. The shortest follow up was 24 months and the longest follow was 60 months (Table no 3).

IV. Discussion

Skin cancers of can be effectively managed with surgery or radiation. Surgery will be in the form of wide local excision ,leading to significant functional or cosmetic problems. Tumors located at various sites like Ala of nose, Antral region, nasolabial folds, medial canthus of the eye and on eye lids, it is very difficult to do approximation of the excised skin margins ,where it requires the assistance of the plastic and cosmetic surgery and the achieved cosmetic results were not as good as those of radiotherapy. Even it is very difficult to achieve negative margin when the tumor is larger in size. For Basal cell carcinoma External Beam Radiation with appropriate energy or brachytherapy usually in the form of interstitial brachytherapy will give 100% control rates(14) there is sufficient evidence to prove that Low Dose Rate (LDR) brachytherapy will deliver higher doses of radiation for local control of oropharyngeal cancers and for limiting toxicity(15-17). The local control and complication rates were similar with LDR and High Dose Rate (HDR) brachytherapy(18,19). It is a generally acceptable policy followed in these studies with moderate doses of EBRT and relatively small doses of HDR brachytherapy to control wide spread lymphatic involvement and implant volume will be more so as to minimize morbidity. But In Basal cell carcinoma, which is a locally malignant disease and will not metastasize to regional lymph nodes and distant mets, local therapy like brachytherapy is the best option. Previous Indian studies were done to treat Basal cell carcinoma with Low Dose Rate(LDR)brachytherapy with 100% recurrence free survival (14). In this study we used HDR interstitial brachytherapy for Basal cell carcinoma as a sole modality unlike in with EBRT, treatment on outpatient basis, reduction in overall treatment time of 10-14 days as compared to 6-8 weeks when compared to of External Beam Radiation

treatment. This option is particularly useful for elderly patients and patients with poor performance status. Unlike with LDR brachytherapy, the patient do not need isolation to prevent radiation exposure to nursing staff doctors and other personal. Follow up examination can detect a local recurrence at the earliest and surgical salvage can be done without much complications as we can limit high dose volume by brachytherapy. Even we can reserve External Beam Radiation as an option for 2nd primaries of head and neck. Our cosmetic results were comparable to those with LDR brachytherapy for Basal cell carcinoma as from study by Vijay Kumar Gupta et al (14) In selected patients with early and superficial lesions, the use of surface mould applicators have advantages like avoiding surgical procedure and interstitial brachytherapy(21). Unfortunately we did not have good mould room facility by the time we got the HDR brachytherapy facility.

V. Conclusion

Interstitial HDR brachytherapy is one of the safe option available for the treatment of Basal cell carcinoma face with excellent survival benefits and cosmetic results as compared to surgery and EBRT, when appropriate Radiotherapy energies and mould room facilities were not available.

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Table no 1: Type of lesion

Clinical Type Of Lesion	Number Of Patients(N=15)
Nodular Ulcerative	10
Nodular	4
Superficial	1

Table no 2: Location of the tumor

Site	Number Of Patients(N=15)
Ala Of Nose	3
Antral Region	3
Tip Of The Nose	2
Lower Eye Lid	2

Medial Canthus Of The Eye	2
Lateral Canthus Of The Eye	2
Nape Of The Neck	1

Table no 3: Follow up data summary

Follow up period(Months)	Pt without disease	recurrence
24-36	3	nil
37-48	6	nil
49-60	6	nil

Basal Cell Carcinoma – Implant Procedure

Figures



Basal Cell Carcinoma – Response to treatment

Figures

