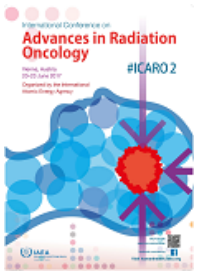

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Clinical outcomes and beam quality correlations on skin cancer radiotherapy management in Mexico: A national institute experience: 2000-2013

Tuesday 20 June 2017 10:35 (5 minutes)

Purpose: To evaluate the outcome of radiotherapy for nonmelanoma skin cancer of Mexican population in terms of the radiation therapy modality received and local relapse-free survival. To show the cost-effectiveness benefit of kV therapy compared to linac based electron therapy.**Introduction**: Nowadays non-melanoma skin cancer (NMSC) is the most frequent malignant disease. Radiotherapy (RT) is a useful noninvasive alternative for some types of NMSC. It represents a valuable method for a minority histologically confirmed NMSC, in patients older than 60 years, where the patient's medical conditions contraindicate surgery procedures, or if the patient refuses surgery or if surgery would result in unacceptable morbidity. We summarize the Mexican population epidemiological data of NMSC patients of thirteen years from a main reference cancer center of Mexico, Instituto Nacional de Cancerología (INCan). RT modalities for NMSC are brachytherapy (BT), superficial x-ray (ST), electron beam (ET) and orthovoltage radiotherapy (OT). We studied the role of different RT modalities mainly kV therapy (ST/OT) vs ET or a combination of different beam qualities.The use of kV units for RT in Mexico has been decreasing in last decades. Nowadays only 6 kV units are installed, 3 in private hospitals and 3 in public hospitals as IMSS (recently in disuse), INCan (now in disuse) and INCMNSZ (recent acquisition and operation). On the other hand, linear accelerators with a wide range of high energy (MeV) electron beams (26 units) are the choice of most facilities for treating superficial tumors including NMSC. The main goal of this study was to compare the efficacy, considered as overall survival (OS), disease-free survival (DFS) and recurrence-free survival (RFS) in terms of the quality of radiation beam utilized. A simple cost-effectiveness study was carried on as well.**Material and Methods**: We made a retrospective chart review of RT management on NMSC on a period of 13 years at the INCan. A total of 1224 patients treated with RT (palliative, radical or post-surgical intention) during 2000 to 2013 for NMSC were collected. Patient data included demographics (age at treatment date, gender, occupation, histology, surgical treatment, zone and lesion diameter). The median age was 72 years and 56% were female patients. Most patients (57%) were treated with kV therapy, the rest with ET (23%) and a combination of Co-60, electron and orthovoltage beams (20%). 24.1% of patients were treated with surgery, followed by RT and 67.2% were treated only with RT. We compared two groups of patients those who were treated with kV therapy and those treated with ET. All patients were treated with one single electron beam (4-6 MeV) in a Varian Linac or kV photon beams (50-200 kV) in a Gulmay kV unit. Radiotherapy data included the total absorbed dose (30-70 Gy) and fractionation scheme (10-35 fractions). The mean operational costs of 15 fractions in 2015 were $\$4,448.00MXNand$17,751.30MXN for kV and ET, respectively. We studied the success/fail according to local failure and survival rate. U-Mann Whitney and Chi2 tests were used in order to find independency and correlations between groups. Kaplan-Meier curves were obtained for estimation of overall, disease-free and recurrence survival. Multi variate analysis was made also in order to analyze other factors contributing the outcome such as surgery. The statistical analyses were performed using v.23 of IBM SPSS Statistics software.**Results and conclusions**: The mean follow-up was 48 months. Population balance in terms on histological subtype were 75% basal and 30% epidermoid. There are few reports illustrating the outcomes of RT for NMSC. Our review includes a heterogeneous sample of beam quality management and it could be the first one in our country. We found a significant correlation (chi2 test, $p<0.03$) when we compare kV vs. ET in terms of clinical outcomes. The test of equality on free-recurrence survival distributions for different levels of RT modality had a significant result

(Log-Rank Mantel-Cox p=0.019) with a best median of 15 months for kV therapy (12 months for ET and 9 for ET+kV). This finding suggests that the kV therapy should be the best decision for RT in NMSC. Moreover, our simple analysis comparing the costs and benefits of each modality enhance this conclusion, being the cost of ET triple expensive than kV therapy. Our finding suggests that keeping and increasing kV units in our country is necessary for a not cure rates reduction alternative. It is important to recognize that this simple technology is allocated to treat superficial lesions and discharge a linac machine for more complex and costly treatments.

Country

Mexico

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