

excluded. The query identified 142 patients who received treatment for clinical Stage II disease. Median age was 38 years (range: 19 – 68), 33 had Stage IIA, 47 IIB, and 62 had IIC disease. Fifty-nine patients were treated with radiation therapy (RT) while 83 received chemotherapy (CT). Only three patients with Stage IIA got CT, and only five with IIC got RT. Median RT dose was 30 Gy. Most common CT regimens used were EP (n = 68) and BEP (n = 13).

Results: After a median follow up of 18 years, 24 patients had died, and there were 16 recurrences (three in the contra-lateral testis). Patients were more likely to die of second cancers (n = 7) and myocardial infarctions (n = 6), than from progressive Seminoma (n = 3). Two patients died during treatment (neutropenia and sepsis). The 10- and 15-year overall survival (OS) was, IIA: 93.8% and 93.8%; IIB: 91.4% and 88.3%; IIC: 83.2% and 76.0%. The 10-year cumulative incidence of relapse (CIR) for Stage IIA patients treated with RT was 3.4%. Stage IIC patients treated with CT had a 10-yr CIR of 10.6%. The 10-year CIR for Stage IIB patients treated with RT (n = 24) versus CT (n = 23) was 29.8% versus 0% (p = 0.005). Seventeen patients developed a second malignancy (SM); non-melanoma skin cancers were excluded. The 15-year cumulative incidence of SM was 7.3% for patients treated with RT, versus 9.7% for those treated with CT (p = 0.321).

Conclusions: Long-term outcomes for patients with Stage II Seminoma continue to be excellent. Patients are more likely to die of second cancers and cardiovascular disease than from progressive seminoma.

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CURRENT PRACTICE OF EXTERNAL BEAM RADIOTHERAPY AND BRACHYTHERAPY FOR MANAGEMENT OF ENDOMETRIAL CANCER IN ONTARIO, CANADA

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Purpose: To describe the practice of adjuvant brachytherapy (BT) and external beam radiotherapy (EBRT) for management of endometrial cancer.

Methods and Materials: An electronic survey including 83 questions focusing on general/demographic information, pre-treatment assessments, radiotherapy policies and EBRT/BT techniques was sent to all 14 regional cancer centres in 2014.

Results: The response rate was 100%. The most frequently used dose/fractionation scheme for EBRT was 45 Gy in 25 fractions. The EBRT technique was 4-Field box in 46%, IMRT in 15%, VMAT in 31% and VMAT/4-Field box in 8% of the centres. Pelvic EBRT was recommended by all centres for Stage II/IIIA/IIIC1 any grade, by 92% of the centres with Stage IB Grade 3 or serous-clear cell carcinoma/Stage IIIC2 any grade and by 70% of the centres for Stage IA serous-clear cell carcinoma. Combination of EBRT and BT was recommended by all centres for Stage II any grade carcinoma, by 92% of the centres for Stage IIIC1 with cervical stromal involvement, by 85% of the centres for Stage IIIA/IIIB/IIIC2 with cervical stromal involvement and by 54% of the centres for Stage IVB any grade with cervical stromal involvement. Adjuvant BT alone was recommended for Stage 1A Grade 3 or Stage 1B Grade 1-2 in 77% of the centres, for Stage 1A serous-clear cell carcinoma in 31% of centres, for Stage 1B Grade 3 in 15% of centres. In 85% of centres, the cases were always peer reviewed. Half of the centres used image verification with x-ray/CT/fluoroscopy after each insertion of the applicator. Bladder and rectal doses were recorded in 8% of the centres using ICRU 38 point doses and in 25% using dose-volume metrics (D2cc). Seventeen percent of the centres treated the upper 3 cm of the vagina, 42% the upper 4 cm, 8% the upper

3-4 cm, 8% the upper 5 cm, 17% the upper half and 8% the upper third of the vagina. The dose was prescribed at the surface of the cylinder and at a depth of 5 mm in 33% and 67% of the centres, respectively. The dose for BT alone prescribed to the surface varied from 6-10.5 Gy x 3-5 fractions. The dose was more uniform when prescribed at depth, with 87% using 7 Gy x 3 fractions. For combination EBRT-BT treatments, BT dose varied from 5-6 Gy x 3 fractions at the surface to 4-5.5 Gy x 2-3 fractions at depth.

Conclusions: Practice patterns regarding the use of EBRT and BT appear to be fairly consistent across the province of Ontario, however, there is considerable heterogeneity in BT treatment planning practices, particularly with respect to length of vagina treated, prescription points, and dose/fractionation. Further research is required to determine the reasons for this heterogeneity, to identify areas where harmonization of practice might lead to clinically significant benefits, and to generate evidence-based practice recommendations for the use of EBRT and BT in the province of Ontario.

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OUTCOME OF STAGE 4A AND 4B HEAD AND NECK SQUAMOUS CELL CARCINOMA: A SINGLE INSTITUTION EXPERIENCE WITH INTENSITY MODULATED RADIOTHERAPY AND VOLUMETRIC MODULATED ARC THERAPY

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Purpose: Our region has higher than provincial average smoking rates and alcohol consumption and lower human papillomavirus (HPV) vaccination rates. These have contributed to high incidence and poor prognosis of head and neck squamous cell carcinoma (HNSCC) in the past. This study reviews our single institution experience with Stage 4A and 4B HNSCC outcomes during 4 years since we adopted Intensity Modulated Radiotherapy (IMRT), Volumetric Modulated Arc Therapy (VMAT) and Image-guided Radiation Therapy (IGRT).

Methods and Materials: All charts of patients with head and neck malignancy between August 2009 and July 2013 were reviewed. Total of 195 consecutive patients met the selection criteria for analysis. There were 100 Stage 4A or 4B locally advanced HNSCC (AJCC-7).

Results: Median age was 63 years (36-88), 81% were male, 21% were P16 positive (the most biologically relevant indicator for HPV-induced oropharyngeal squamous cell carcinoma), 74% had two or more major comorbidities. Most common sites are oropharynx (52%), hypopharynx (13%) and larynx (10%). Majority 96% received radiotherapy, including 90% IMRT and 37% VMAT, 86% received 50 Gy or higher dose, 39% had surgery, and 62% had chemotherapy. Using Kaplan-Meier life table, the 2/3 year local regional control rates are 82.8% and 80.5% respectively, and the 2/3 year overall survival rates are 62.3% and 57.4% respectively. Median survival has not been reached. There was no treatment related death and 25% had Grade 3-4 acute toxicity (RTOG Acute Radiation Morbidity Scoring Criteria).

Conclusions: Stage 4A and 4B HNSCC outcome in our institution is better than historical data. This might be due to our multidisciplinary approach and the introduction of new technology including IMRT, VMAT, and IGRT. Normal tissue tolerance dose constraints usually can be met using IMRT or VMAT. The local regional control and overall survival is excellent despite significant comorbidities associated with unhealthy life style in this region.