regression analysis were used to estimate recurrence-free (RFS), disease-specific (DSS) and overall survival (OS) and to identify factors impacting outcomes. 

**Results:** Median follow-up was 44 months and median age was 62 years. 12 patients (92%) underwent simple hysterectomy, 78% had lymph node dissection and 95% had peritoneal cytology examination. 99 patients (76%) received adjuvant radiation treatment (RT) with vaginal cuff brachytherapy alone or pelvic external beam RT or combination. 5-year RFS, DSS and OS was 77%, 90%, and 72%, respectively. There was a significant difference in RFS between those who received adjuvant RT compared to those who did not with 5-year RFS of 85% versus 52%, respectively (p<0.001). There was no significant difference in 5-year RFS, DSS and OS between women who received simple versus those who received radical or modified radical hysterectomies (74% vs. 80%, p=0.12), (90% vs. 100%, p=0.32), and (73% vs. 100%, p=0.43), respectively. Also, there was no significant difference in 5-year RFS, DSS and OS between women who underwent pelvic nodal dissection and those who did not (75% vs. 77%, p=0.87), (88% vs. 100%, p=0.09), and (74% vs. 73%, p=0.94), respectively. Similarly, there was no difference in outcome of women who received adjuvant vaginal brachytherapy alone versus those who received pelvic external beam RT alone or in combination with vaginal brachytherapy (80% vs. 87%, p=0.46), (90% vs. 96%, p=0.29), and (85% vs. 77%, p=0.72), respectively. On multivariate analysis of RFS, lack of adjuvant RT, the presence of lymphovascular invasion (LVI) and high tumor grades were significant adverse predictors while LVI and high tumor grades were significant predictors of DSS. Old age and high tumor grade were the only predictors of OS.

**Conclusions:** In this multi-institutional study, disease-specific survival for women with FIGO stage II uterine endometrioid carcinoma is excellent. High tumor grade, lymphovascular space involvement, lack of adjuvant radiation treatment and old age are important prognostic factors. Neither the type of hysterectomy nor the type of adjuvant radiation treatment appears to impact survival endpoints.

**PP08 Presentation Time: 10:54 AM**

MRI-Based Evaluation of Coverage of the Vaginal Cuff in Endometrial Brachytherapy: Are We Missing the Target?

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**Purpose:** Although local control rates are high in appropriately selected endometrial cancer patients who undergo vaginal cylinder based brachytherapy (VB), a subset of patients experience isolated vaginal cuff failures. Most institutions use post-placement non-contrast CT scans to evaluate vaginal cylinder placement, given that it provides good contrast between the soft tissue of the vaginal cuff and air between the cuff and cylinder that may signal incomplete placement. However, CT provides less contrast between lubricant that is placed on the cylinder and the vaginal cuff. It is unknown whether insufficient coverage of the vaginal cuff may be contributing to isolated vaginal failures. Additionally, surgical techniques have evolved over the past few decades, with many more patients undergoing laparoscopic versus open hysterectomies. Laparoscopic hysterectomies have been shown to lead to higher rates of vaginal cuff dehiscence, so it is unknown whether compensatory surgical techniques may inadvertently lead to an increase in inaccessible areas of vaginal cuff. T2-weighted MR images (T2WI) provide better visualization of the vaginal cuff, which may allow for better assessment of cylinder placement and dose to the vaginal cuff.

**Materials and Methods:** We retrospectively analyzed 57 MRI scans on 25 individual patients with endometrial cancer who underwent adjuvant vaginal brachytherapy. Axial, coronal and sagittal MRI were reviewed. The minimum dose to the vaginal cuff (intermediate signal). Twelve patients (48%) had at least one MRI with evidence of an UVC. The minimum dose to the UVC in these patients ranged from 0.71 Gy to 5.46 Gy, or 10% to 78% of the 7 Gy prescription dose (mean 2.26 Gy or 32% of the prescription dose.) Of patients with an evident UVC, 75% had areas of the cuff that received less than 50% of the prescription dose and 92% had areas of the cuff that received less than 75% of the prescription dose. The UVC was apparent in the sagittal, coronal, or axial planes in different patients, depending on the orientation of vaginal laxity. Simultaneous CT scans in the same time frame as the MRI were not available for most patients; however, direct comparison on one patient showed that the UVC clearly identified on MRI was not seen on the accompanying CT scan due to the surrounding soft tissue with similar density to the vaginal cuff. In other patients, the absence of gas in the UVC on MRI implies this finding would not have been evident by CT. Some patients had areas of UVC that were greater than 2 cm from the vaginal cylinder.

**Conclusions:** T2WI allow for evaluation of vaginal cylinder placement and dose to the vaginal cuff. Almost half of our patients had visibly evident areas of the upper vaginal cuff without direct contact with the vaginal cylinder. This led to significant underdosing in up to 75% of patients, evidenced by the vaginal cuff receiving less than half of the prescription dose. The problem is likely multifactorial, as UVC best seen in axial planes may suggest that a larger diameter cylinder is needed in the vicinity of the cuff (though possibly limited by the size of the introitus), whereas UVC best seen in the sagittal or coronal planes may suggest that the cylinder needs to be advanced further or that any suture on all but the most superior area of the cuff may be limiting advancement and leading to underdosing. In the later scenario, dwell times could be increased at the vaginal apex to improve coverage.

**PP09 Presentation Time: 11:03 AM**

Reirradiation Using Interstitial Brachytherapy for Recurrent Gynecologic Cancer

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**Purpose:** To report predictors of toxicity and preliminary outcomes of reirradiation with interstitial brachytherapy (ISBT) for recurrent cancers of the female reproductive tract.

**Materials and Methods:** All patients who received ISBT at our institution were retrospectively reviewed. Twenty-one patients who had recurrent cancer at time of treatment were identified. Demographic, disease specific, treatment, toxicity and outcome data were collected. Kaplan-Meier and proportional hazard models were used to estimate survival, and logistic regression to model toxicity. A least absolute shrinkage and selection operator (LASSO) penalty was used to identify relevant predictors of outcome and toxicity.

**Results:** Eighteen patients received prior pelvic radiation. Median age of patients was 60 years (range 42 to 81 years). Median Karnofsky Performance Status was 90%. Eleven patients had uterine cancer, seven patients had cervical cancer, and three patients had vulvar cancer. The indication for ISBT was vaginal involvement in 15 patients, vulva involvement in three patients, and pelvic sidewall involvement in three patients. Tumors were a median of 3.0 cm (range 1.5 to 10 cm). ISBT was performed using Iridium-192 sources (10 low dose rate, 11 high dose rate). Low dose rate treatment was delivered over 37.5 to 88.0 hours (median 70.0 hours). Median low dose rate dose was 41.5 Gy (range 28.5 to 55.0 Gy). Median high dose rate dose was 22.5 Gy (range 13.5 - 30 Gy) delivered in three to five twice-daily fractions (median 5). Ten patients received pelvic irradiation for recurrent disease prior to ISBT. One year actuarial freedom from local-regional failure, progression free