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INTERMEDIATE-RISK PROSTATE CANCER, ANDROGEN DEPRIVATION THERAPY AND THE RISK OF DEATH
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Purpose: Intermediate-risk prostate cancer comprises a heterogenous group, whose management includes external radiation (EBRT), brachytherapy (brachy), or surgery. Androgen deprivation therapy (ADT) has been shown to improve survival in IR prostate cancer when combined with standard dose EBRT (RTOG 9408). Its role with brachy is unclear, but appears to add 10-15% absolute improvement in biochemical control (as presented at CARO 2015). In our practice the use of ADT in this context has declined from 91% in 1990 to 21% in 2015, because of uncertainty of its role, and concerns of toxicity. The aim of this study was to examine the effect of ADT on subsequent survival of men treated for IR with brachy.
Methods and Materials: Men treated for IR prostate cancer 1998-2011 were prospectively followed in an outcomes database. They were risk grouped using the ProCars scheme into low- and high-IR. Endpoints were biochemical control (bNED, by the Phoenix, nadir + 2 definition) and survival. Death information was obtained from the provincial cancer registry. Cause of death was ascribed to prostate cancer, cardiovascular disease, other cause, or unknown. bNED and survival were calculated using the Kaplan-Meier method with log-rank statistics, and multivariable analysis performed.
Results: 2232 men form the study cohort. Eighty-seven percent had low-IR cancer, and 13% high-IR. Six months of neoadjuvant and concurrent ADT was used in 50%. Ninety-nine percent received 125I low dose rate permanent brachytherapy monotherapy (144 Gy) and 1% received 115 Gy plus pelvic EBRT, (46 Gy). Median follow up for bNED is five years (range 0-17) and for survival seven years (4-17, with 23% followed for more than 10 years). Actuarial biochemical control at 10 years is 74% without, and 88% with ADT ($p < 0.001$), and both low-IR (77% versus 86%) and high-IR (68% versus 83% at six years) show this improvement. Overall survival is 89% without ADT and 85% with ADT at 10 years ($p = 0.041$). Cardiovascular deaths were significantly increased with ADT (5% versus 2.3% at 10 years, $p = 0.015$), and contribute to the decreased overall survival observed. Prostate cancer deaths occurred in 0.5% and 1.5% without and with ADT, at 10 years. Multivariable analysis shows that the excess cardiac deaths are due to comorbidity and age.
Conclusions: Although bNED is improved by the addition of six months of ADT, overall survival is worse when examined in a mature dataset. This detriment is due to excess non-prostate causes, including cardiovascular deaths. The main drivers of the latter appear to be presence of cardiac risk factors, other comorbidity, and age. The use of ADT may be a particular concern in patients with such risk factors. Benefits, risks, and patient preference should be considered when determining the addition of ADT with BT for IR prostate cancer.

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ACUTE COMPLICATIONS OF PERINEAL INTERSTITIAL BRACHYTHERAPY (ISBT) IMPLANTS IN GYNECOLOGICAL CANCER PATIENTS: PROSPECTIVE ANALYSIS OF ORGAN INJURY AND INFECTION
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Purpose: Brachytherapy is an integral component of radiation treatment of gynecological malignancies. Many locally-advanced pelvic tumours may not be adequately controlled with intracavitary techniques due to challenges in dose conformality. ISBT can improve dosimetry through the insertion of catheter needles directly into tumour tissue. However, due to its invasiveness and potential risks of complications, there is a lack of expertise in ISBT. The goal is to evaluate the safety of ISBT by studying the acute complications with a perineal applicator technique.
Methods and Materials: Thirty-nine patients at a single institution treated with high-dose rate perineal ISBT from September 2014 to January 2016 were included in a prospective registry trial. Median age was 65 (range 23-88) with 13 cervical cancer patients, 11 vaginal, 11 recurrent endometrial, one vulvar. Three patients were treated palliatively. No bowel preparation was used prior to implant and no antibiotics were given perioperatively. Post-procedure, patients were imaged with CT or MRI with no attempt to adjust needle depth or position after review of imaging. First follow up visit occurred within 6 weeks after treatment and then 2-3 months later. Post-operative adverse events were graded with CTCAE V3.0 and radiation related toxicity with RTOG common criteria.
Results: Median follow up time was three months. Thirty-four patients were initially treated with external beam radiation therapy to the pelvis with a dose of 45 Gy (median). A total of 56 implants were performed; 22 patients received one implant while 17 had two. Median hospital stay was two days (1-5). The median number of needles for each implantation was 17 (8-26). The most commonly invaded organ by the interstitial catheters was the bladder (13) followed by bowel (10) and rectum (nine). Eighteen patients had radiological evidence of needle intrusion to a pelvic organ and six patients had more than one pelvic organ punctured by the catheters. Two acute organ complications attributable to needle intrusion to the bladder were found. One patient developed G1 hematuria and was discharged without delay and another had G2 hematuria requiring manual saline irrigation. No GI complications were found. Three patients developed perineal cellulitis post-ISBT. Acute radiation-related toxicities were seen in six patients with Grade 1 GI and/or GU.
Conclusions: ISBT is a safe and feasible treatment for locally-advanced gynecological cancers. With no attempted post-treatment adjustment, radiological evidence of needle intrusion into pelvic organs is a common finding. No severe organ complications were found and the rate of acute complications are low. Vulva and perineal infection post-ISBT was the most common complication related to needle implantation. The development of real-time image-guidance may improve implant positioning for tumour coverage but likely will not affect the existing low rate of acute organ complications.

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COMPARING RADICAL PROSTATECTOMY AND PERMANENT SEED BRACHYTHERAPY FOR LOW AND INTERMEDIATE-RISK CANCER
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Purpose: To compare results of radical prostatectomy (RP) and permanent seed prostate brachytherapy (PB) is difficult because of different definitions for recurrence and differences in baseline characteristics. We analyzed treatment results of both treatments in low- and low-intermediate prostate cancer patients from a single tertiary centre using similar definitions for biochemical recurrence.
Methods and Materials: Patients were selected from each department's internal database based on pre-operative selection criteria from NCCN guidelines (2015) for low- and low-intermediate-risk patients. All selected patients had complete data on Gleason score, clinical staging and pre-treatment prostate specific antigen (PSA) value and none had received any neo-adjuvant androgen deprivation therapy. The end point was biochemical recurrence (BCR) or any salvage treatment for both RP and PB at 48 (± 4) months after treatment. The biochemical relapse threshold was set at PSA ≥ 0.5ng/mL for PB and two PSA values ≥ 0.2 ng/mL for RP. Patients from both treatment groups were compared using non-parametric tests. A binary logistic regression analysis was done to test an association of treatment and pre-treatment factors with a BCR at 48 months.