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Brachytherapy

160 Gy dose-escalation in I-125 prostate implants: Updated outcomes and toxicity

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Introduction. D90 of 145 Gy was adopted as the standard for I-125 seed implants. Dose-escalation in EBRT benefit is widely demonstrated for prostate cancer.

Objective. The aim of this dose escalating study (from D90 > 145 Gy to D90 > 160 Gy) is to analyze the biochemical recurrence-free survival (bRFS) and toxicity profile of prostate cancer patients treated with I-125 seeds implant.

Materials and methods. From January 08 to December 10, 219 low-risk and one factor intermediate-risk patients were chosen for 160 Gy I-125 therapies. Previous MRI, urinary flowmetry and IPSS questionnaire were realized. Using real-time intraoperative interactive planning, prescribed dose was 160 Gy, keeping the same urethral and rectal constraints as when 144 Gy was the prescribed dose. One month post-implant CT and MRI were realized for post-planning. Median age was 68 years old (range 41–79), median PSA 7.7 ng/ml (range 2–33) and median Gleason 6. 79 patients were treated with hormone therapy (HT) (media duration 4 months). Median US prostate volume was 35 cm^3 (range 10–72). Retrospectively maximal acute and chronic toxicity, using CTCv4.0 and RTOG scales, and bRFS, using Phoenix definition, were evaluated.

Results. The incidence of grade 3–4 acute toxicity was 3% (8 patients required urinary catheter because of acute retention, all solved with medical treatment). No grade 3–4 chronic toxicity was observed. 73% of patients remained sexual function. 13 (6%) patients presented biochemical failure. All patient with negative complementary exams (12/13) underwent to trans-perineal prostate saturation biopsy, always, at least, 2 years after treatment. One of them presented histological failure and salvage treatment with a new seed implant (120 Gy) was done. Unique distant failure was an isolated bone metastasis treated with HT and SBRT.

Conclusion. Dose escalation to 160 Gy in I-125 prostate implants does not give rise more toxicity than 145 Gy. Clinical results are encouraging, but with a short follow-up.

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Acelerated partial breast irradiation (APBI) with high dose rate brachytherapy: Feasibility, clinical results in terms of survival, relapse and toxicity

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Introduction. Most recurrences alter breast conserving surgery occur within the index cuadrant despite the presence of multi-centric cancers elsewhere in the breast. Thus, partial breast irradiation might be adequate for selected patients. High dose rate brachytherapy (HDR-BT) is a feasible and comfortable technique for this partial approach.

Aim. After previous experience using HDR-BT as a boost, the aim of the study was to evaluate the feasibility, clinical results and toxicity of HDR-BT delivered following the national protocol from SEOR Brachytherapy Group.

Methods. Between 2002 and 2013, 95 patients with early stage breast cancer were treated after conservative surgery with HDR-BT using metallic needles adapted to surgical bed, with CT-based 3D dosimetry, delivering a dose of 32 Gy in 8 fractions of 4 Gy, as the unique adjuvant radiation treatment.

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Results. From the 95 patients treated, we analyse the subgroup of 85 patients who had enough follow-up to evaluate late toxicity. The mean age at treatment was 67 (range 45–92). Most of the tumors were located at external superior cuadrant (41.2%) or joint of superior cuadrants (15.3%). Eighty per cent were infiltrating ductal carcinomas with an 84.7% of stage IA tumors and 70% of luminal A molecular subtypes. Only 6 patients were grade 3, they were treated with HDR-BT due to their age. Fifty-one patients received adjuvant hormonal therapy. Most patients (70.6%) were treated using 7 needles (range 4–12) in 2–3 planes, with a mean active length of 4.5 cm (range 2–7 cm). With a mean follow-up of 23.47 months (range 6–124), only one patient has experimented a recurrence in the ipsilateral breast 21 months after the procedure, she had a triple negative tumor and was treated with mastectomy without disease nowadays. Three patients died from another non-related disease (cerebral-vascular stroke), none of them died from breast cancer disease. Late toxicity was mild, with 27% and 5% of grade I cutaneous and subcutaneous toxicity respectively.
Conclusions. Accelerated partial breast irradiation using HDR-BT is a proper approach, with excellent results in terms of disease free survival and very good tolerance in terms of normal tissue late toxicity.

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Brachytherapy implant for patients with transurethral resection in prostate cancer

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Purpose. Low dose rate (LDR) prostate brachytherapy is an accepted, effective and safe therapy for localized prostate cancer in patients with transurethral resection. We analyzed oncologic outcome, side-effects and complications after I-125 brachytherapy based on 11 years of experience.
Methods and materials. Between June 2000 and December 2005, 56 consecutive patients were treated with clinically localized prostate cancer. No patients received external beam radiation. All of them underwent LDR prostate brachytherapy. Biochemical failure was defined according to the "Phoenix consensus". Patients were stratified as intermediate risk based on D'Amico definition.
Results. The median follow up time for these 56 patients was 100 months; 2 had a clinical relapse and 4 had biochemical relapse. The 11-year actuarial biochemical control was 92%, (SD ±3%) for overall group. The multivariate Cox regression analyses no identified, independent prognostic factors for biochemical failure. The actuarial biochemical control with Gleason score was 93% and 88% for patients with Gleason score of ≤6 and =7, respectively. The biochemical control was 95%, and 85% for patients with PSA of ≤10 and >20 ng/ml, respectively. A patient reported incontinence after treatment (1,7%). Acute urinary retention was seen in 2 (3.5%). Gastrointestinal toxicity grade III–IV has been observed in 2 patients (3.5%).
Conclusions. The excellent long-term results and low morbidity presented, as well as the many advantages of prostate brachytherapy over other treatments, demonstrates that brachytherapy is an effective treatment for patients with transurethral resection and clinical organ-confined prostate cancer.

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Doppler analysis in regression of uveal melanoma after radioactive plaque

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Purpose/objective. Study the blood supply of uveal melanoma as a sign of tumoral activity and quantify its presence after brachytherapy.
Materials and methods. 50 cases treated with brachytherapy were reviewed from July 2005 to June 2010. Mean follow-up was 29 months (13.7–69 months). Duplex Doppler scans (gray scale and Doppler scans) were done at diagnosis and every 6 months after treatment. Presence of intratumoral vessels, maximum systolic and diastolic velocity and resistance index were evaluated. The average age was 60 years; 26 ♂ and 24 ♀. Mean basal size and thickness at diagnosis were 12.1 mm × 5.6 mm (SD 3.0–5.6). The most used plaque was COMS type. Apical dose was 85 Gy.
Results. Doppler detected intratumoral vascularization at diagnosis in 21/50 cases, 7 persisted at 6, 12 and 18 months, to 24 months 5/31, 30 months 3/20, 36 months 1/12, 42 months 1/6, 48 months 1/3, 54 months 1/2 and 60 months 0/1. Mean systolic