

21

THE INFLUENCE OF BLADDER VOLUME ON DOSIMETRY DURING VAGINAL VAULT BRACHYTHERAPY

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The influence of varying bladder volumes on dosimetry has been evaluated in patients receiving intravaginal HDR following hysterectomy for endometrial carcinoma. A sequential series of 106 patients attending for vault brachytherapy were catheterised prior to treatment and their residual bladder volumes after voiding measured. The median residual volume was 35ml (range 5-600). Subsequent patients have been evaluated using CT scans with the bladder empty, an indwelling catheter insitu, and with either 35, 70 or 100ml of water introduced into the bladder; and analysed with respect to a single line source vaginal applicator. The first 7 sets of scans have been analysed comparing the empty bladder scans with either 70mls (4 patients) or 100mls (3 patients) bladder volume. The scan slice taken through the mid-point of the indwelling catheter balloon (the "O" position) has been taken as a reference point. The bladder area on this scan slice when empty was a mean of 40.1cm² (+/- 12.9) rising to 49.9cm² (+/- 11.7) with 70ml of fluid and 54.6cm² (+/- 8.0) with 100ml bladder volume. The median height of the bladder above the inferior margin of the catheter balloon was 2cm (range 2-5cm) with the bladder empty increasing to 4.5cm (range 2-5cm) with a 70ml bladder volume and 5cm (range 4-6) with a 100ml bladder volume. At the slice in which the most superior source dwell position was present the bladder was absent in all cases with an empty bladder but present in all cases with either 70 or 100ml bladder volume and with both empty and full bladder, small bowel could be identified in this CT slice. A median reduction in small bowel area on the full bladder scan of 50% (range 25-75) was seen compared to the area of small bowel present with the bladder empty. The maximum dose to the bladder wall 1cm below the "O" slice was a mean of 1.5Gy greater when the bladder was full compared to the scans with the bladder empty. In summary the dose delivered to the bladder and small bowel during vault brachytherapy is dependent upon bladder volume. The results of this study show an increased radiation dose to small bowel but reduced bladder dose when the bladder is empty. A fixed volume of 70-100ml within the bladder produces a compromise between maximum bladder dose and dose to small bowel.

23

WHAT ABOUT LOW-RISK FIGO STAGE IA AND IB, G1-G2 ENDOMETRIAL ADENOCARCINOMA?

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Objective: To evaluate the therapeutic outcome of low-risk FIGO Stage IA-IB, G1-G2 patients (pts). **Patients and methods:** From 1979 to 1995, 350 pts with FIGO Stage I endometrial adenocarcinoma were referred to us: 67 pts (19%) were in Stage IA, 186 (53%) were in Stage IB, and 97 (28%) were in Stage IC. Within Stage IA, 34 pts had well-differentiated (G1), 24 pts had moderately well differentiated (G2), and 9 pts had poorly differentiated tumor (G3). Within Stage IB, 93 pts had G1, 61 pts had G2, and 32 had G3 tumor. Within Stage IC, 39 pts had G1, 38 pts had G2, and 20 had G3 tumor. The median age was 65 years. All pts underwent surgery and intravaginal vault irradiation (22.5 Gy in 3 fractions over 3 weeks with a high dose rate remote afterloading technique). In addition 56/186 Stage IB pts with greater than 30% myometrial invasion, and 85/97 Stage IC pts received external pelvic radiation (45 Gy). **Results:** According to differentiation, the 5-year overall survival (OS) was 96% in Stage IAG1, 95% in Stage IBG1, 74% in Stage ICG1, 84.7% in Stage IAG2, 88.2% in Stage IBG2, 73.3% in Stage ICG2, 80% in Stage IAG3, 69.4% in Stage IBG3, and 65.5% in Stage ICG3. Similarly the 5-year disease-free survival (DFS) decreased with increasing grade and substage from 93% for G1 and Stage IA-IB to 67% for G3 and Stage IC. Late complications included grade 2-3 vaginal stenosis (in 6% of Stage IA pts, in 26% of Stage IB pts, and in 34% of Stage IC pts), intestinal stenosis/fistula (in 3% of Stage IA pts, in 2% of Stage IB pts, and in 8% of Stage IC pts). **Conclusion:** Facing the excellent results obtained in low grade Stage IA and IB, we decided to participate to the current Stockholm protocol, investigating the necessity of vaginal irradiation.

22

INTERSTITIAL Ir-192 BRACHYTHERAPY FOR PRIMARY CARCINOMA OF THE VAGINA

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PURPOSE: Brachytherapy techniques have played an important role in the management of primary vaginal cancer. A retrospective review was performed to assess the long term results of an interstitial Ir-192 afterloading implant technique for vaginal lesions. **MATERIALS AND METHODS:** Between 2/76 and 1/92, a total of 71 patients (pts) underwent interstitial implantation using an afterloading template technique for primary vaginal cancer. Mean age of pts was 59 yrs (16086). Histologies treated included squamous (58), adenocarcinoma (7), adenosquamous (1), and clear cell (5). Pts were staged according to the Perez modification of the FIGO system, and included Stage I (10), Stage IIA (14), Stage IIB (27), Stage III (15), and Stage IV (5). Implantation was integrated with pelvic irradiation in 62 pts, or was used alone in 9 pts. 19 pts underwent implantation with intra-pelvic laparotomy guidance. **RESULTS:** Followup is complete >5 yrs for 48/71 pts (range 3-163 months). Local control was achieved in 56/71 pts (79%). Local control by stage is as follows: Stage I, 90% (9/10), Stage IIA, 93% (13/14), Stage IIB, 81% (22/27), Stage III, 53% (8/15), and Stage IV, 80% (4/5). For the total group, actuarial 2, 5, and 10 year survivals are 73%, 58%, and 58%. By stage, 2 and 5 year actuarial survivals are as follows: Stage I, 100%, 100%; Stage IIA, 86%, 60%; Stage IIB, 81%, 71%; Stage III, 45%, 30%; and Stage IV, 20%, 0%. Significant complications were seen in 9/71 pts (13%), including soft tissue necrosis (4), fistulae (4), and small bowel obstruction (1). **CONCLUSION:** Local control can be achieved in the majority of patients with primary carcinoma of the vagina with acceptable risk of morbidity. The curative potential for patients with Stage I-III disease was demonstrated. Strategies to improve the results of therapy will be discussed.

24

Ir-192 HDR PLESIO-BRACHYTHERAPY OF THE VAGINA WITH A DEDICATED TEMPLATE. A SERIES OF 128 ENDOMETRIAL CARCINOMAS.

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Aim of study : evaluation of a dedicated vaginal template to irradiated the upper vagina after hysterectomy.

Material : between 8/1990 and 12/1995, 128 patients with adenocarcinoma of the endometrium were included. There was 108 T1 and 20 T2. Invasion of 30% or more of the myometrium was always present. 20 patients had positive lymph nodes.

Treatment: all the patients underwent total hysterectomy (with lymphadenectomy in 67% of cases). Postoperative external beam irradiation was given with a 4 field box technique: 46 Gy/23 F/4w 1/2 ICRU point. 2 weeks later brachytherapy was given with Iridium HDR. 2 applications 1 week apart with a mucosal surface dose of 7 Gy.

Vaginal template: it is designed in lucite in such a way that the surface of the template conform exactly to the 7 Gy isodose. 2 channels are drilled to be loaded with the iridium 192 source. The length of upper vagina irradiated is 4 cm. The dose at 5 mm is 4.3 Gy.

Results : the median follow-up time is 38 months. The overall survival is 85%. There has been 1 vaginal relapse and 4 pelvic relapses. The acute and late complications have been negligible in all patients. No vaginal telangiectasia or stenosis were observed.

Conclusion : this dedicated template which provides an homogeneous dose in the upper vagina with HDR Iridium gives very good early and late results.