radiotherapy (50.2Gy/27#, 50Gy/25# or 45Gy/25#) followed by brachytherapy (26Gy/4# or 28Gy/4# to HRCTV). In the current study the original treatment plans were re-optimised, using Brachyvision Version 11. The aim was to escalate the GTV(BT) dose to 140% of the original HRCTV prescription dose (8.4Gy and 9.8Gy/# respectively), keeping the HRCTV coverage and organ at risk DVH values within the tolerance which had been accepted for the original clinical plans. GTV (BT) and HRCTV were drawn according to GEC-ESTRO recommendations. The relationship between the volumes can be defined by the following equation. HRCTV2 = HRCTV1 – GTV(BT) The quality of the re-optimised plans was quantified by using dose volume histogram parameters.

Results: Table 1 shows a comparison of the original and the re-optimised plan parameters.In 10 out of the 14 cases (71.4%) more than 90% of the GTV(BT) was covered by the 140% isodose after re-optimisation.The HRCTV1 V100% was reduced for the re-optimised plans by an average of 2.95% (range 0.7-6.01%).Average coverage of HRCTV2 with the prescription isodose was 94.5% for the 6Gy plans, and 81.7% for the 7Gy plans.In 12 out of the 14 cases (85.7%) the treatment time was reduced with the boost plan.

6Gy/#	Original clinical plan				Re-optimised plan			
Patient number	HDRHR-CTV V100% of vol	HDR Bladder D2cc (Gy)	HDR Rectum D2cc (Gy)	HDR Sigmoid D2cc (Gy)	HDRHR-CTV V100% of vol	HDR Bladder D2cc (Gy)	HDR Rectum D2cc (Gy)	HDR Sigmoid D2cc (Gy)
1	97.7	5.3	3.9	4.0	95.1	5.5	3.8	3.9
2	90.8	7.5	3.1	3.7	86.8	7.6	3.2	3.9
3	99.3	5.0	2.8	2.3	93.3	4.3	1.8	2.0
4	97.3	5.3	1.5	3.8	95.2	5.4	1.6	3.7
5	99.0	5.1	2.2	4.1	98.5	4.9	2.2	4.0
6	99.7	3.9	3.1	4.1	97.7	3.1	1.9	3.7
7	97.9	4.8	2.1	4.1	97.2	4.2	2.6	4.1

Patient number	Number of needles inserted into GTV(BT)	IU inserted into GTV(BT)	$V_{100\%\ CTV2}$ (%)	$V\ 8.4_{Gy\ CTV2}$ (%)	GTV(BT) V8.4Gy (%)
1	4	0	94.8	48.60	98.8
2	1	0	88.0	65.60	89.6
3	0	1	92.4	65.70	97.8
4	3	0	93.4	61.80	92.8
5	Needles in close proximity to GTV(BT)	1	98.5	79.80	99.1
6	3	1	98.0	81.10	81.4
7	1	1	96.3	58.00	93.3

7Gy/#	Original clinical plan				Re-optimised plan			
Patient number	HDRHR-CTV V100% of vol	HDR Bladder D2cc (Gy)	HDR Rectum D2cc (Gy)	HDR Sigmoid D2cc (Gy)	HDRHR-CTV V100% of vol	HDR Bladder D2cc (Gy)	HDR Rectum D2cc (Gy)	HDR Sigmoid D2cc (Gy)
8	36.1	4.3	1.5	3.5	36.1	4.3	1.5	3.5
9	76.6	5.0	2.5	3.5	95.6	5.1	2.9	4.5
10	90.8	5.7	1.5	2.2	85.1	5.9	0.9	2.4
11	99.3	4.9	4.2	4.8	97.3	4.9	3.3	4.8
12	96.3	5.5	1.9	4.7	95.1	5.4	1.7	4.6
13	99.6	5.5	3.3	2.9	91.1	5.5	2.0	2.2
14	89.0	6.6	4.6	1.6	88.8	6.4	4.4	1.6

Patient number	Number of needles inserte into GTV(BT)	I inserte into GTV(BT)	V $7_{Gy\ CTV2}$ (cc)	V $9.8_{Gy\ CTV}$ (cc)	GTV(BT) V9.8Gy (%)
8	0	1	27.0	16.8	42.9
9	0	1	94.3	62.1	97.7
10	0	0	84.6	66.0	66.1
11	0	0	94.9	56.4	92.6
12	0	1	94.8	72.6	100
13	0	1	89.3	64.9	100
14	Needles in close proximity to GTV(BT)	1	87.0	42.7	95.5

Table 1: Reporting parameters for the standard and re-optimised GTV (BT) boost plan

Conclusion: It is possible to boost the prescription dose to the GTV(BT) to 140% for treatment plans with interstitial catheters and IU within the GTV(BT) volume. Plans without both interstitial catheters and IU in the GTV(BT) are most likely to be suboptimal. This planning study demonstrates that dose escalation to the GTV(BT) is feasible if clinically indicated, and further work into clinical application and outcome should be considered.

PO-0958

Locally advanced cervical cancer treated with IGABT: impact of the D90 HR-CTV on patterns of relapse

C. Chargari[1], R. Mazeron[1], P. Maroun[1], I. Dumas[1], F. Martinetti[1], A. Tafo-Guemnie[1], E. Deutsch[2], P. Morice[3], C. Haie-Meder[1]
[1]*Institut Gustave Roussy, brachytherapy, Villejuif, France*
[2]*Institut Gustave Roussy, Radiotherapy, Villejuif, France*
[3]*Institut Gustave Roussy, Surgical Oncology, Villejuif, France*

Purpose or Objective: Locally advanced cervical cancer patients with a bulky high-risk clinical target volume (HR-CTV) get the largest benefit of dose escalation in terms of local control. But the expected survival benefit could be lessened by a higher metastatic risk. We examined the patterns of relapse according to the HR-CTV and to the ability to reach the target dose.

Material and Methods: Pts treated with chemoradiation between 04/2007 and 02/2012 were included if they had a disease limited to the pelvis after an exhaustive primary staging (PET/CT plus primary laparoscopic para-aortic lymphadenectomy) and if they had received concurrent chemotherapy. Pts received pelvic irradiation (45 Gy) then a PDR brachytherapy boost +/- a pelvic sequential boost for PET positive pelvic lymph nodes. First sites of relapse were examined.

Results: 109 pts were included, with median follow-up of 39 months. Median D90 HR-CTV was 73.5 Gy in case of HR-CTV ≥ 30 cm3 (n = 28) *versus* 86.4 Gy in case of HR-CTV < 30 cm3 (p < 0.001). Pts with a not-bulky HR-CTV (< 30 cm3) experienced local failure in 5/81 (6.2%), *versus* in 6/28 (21.4 %) in case of bulky HR-CTV (p =0.03), but the HR-CTV volume did not correlate with the risk of local failures as only events. Pts with a bulky HR-CTV volume had a higher risk of distant failures: 10/28 (35.8 %) *versus* 7/81 (8.6 %) in case of not-bulky HR-CTV (p = 0.002). Local failures were seen in 3/47 (6.4 %) for pts with a D90 HR-CTV ≥ 85 Gy and in 8/62 (12.9 %) for pts with a D90 HR-CTV < 85 Gy, respectively (p=0.055). Distant failures were seen in 1/47 (2.1 %) and in 16/62 (25.8 %), respectively (p<0.001). This higher frequency of distant events in pts with a D90 HR-CTV < 85 Gy remained significant after exclusion of local failures: 0/44 (0 %) *versus* 11/54 (20.4 %), respectively (p < 0.001).

Conclusion: The inability to reach the target dose seems correlated with a higher propensity to metastases. Strategies integrating the metastatic risk are mandatory for maximizing the benefit of dose escalation.

PO-0959

Dosimetric outcome and perioperative toxicity using Utrecht applicator in cervical brachytherapy

F.J. Celada Alvarez[1], J. Burgos[2], S. Roldán[2], R. Chicas[2], D. Farga[2], M. Pérez[2], I. Paredero[3], J. Pérez-Calatayud[4], A. Tormo[2]
[1]*Universidad de Valencia, Programa de Doctorado de Medicina, Valencia, Spain*
[2]*Hospital Universitari i Politecnic La Fe, Oncología Radioterápica, Valencia, Spain*
[3]*Hospital Doctor Peset, Oncología Médica, Valencia, Spain*
[4]*Hospital Universitari i Politecnic La Fe, Radiofísica, Valencia, Spain*

Purpose or Objective: GEC-ESTRO recommendations for IGRT in brachytherapy, the incorporation of MRI in the planning and new MRI-compatible applicators have improved our treatments. But, in big tumours, intrauterine applicators don´t seem enough in order to reach a good coverage. Interstitial CT-MRI Utrecht (Elekta®) applicator with plastic needles lets improve HR-CTV and IR-CTV coverage sparing organs at risk. However, a further complication using interstitial applicators may be gynaecological bleeding during the withdrawal of the applicator.
The purpose of this study is to review perioperative toxicity and dosimetry in patients with cervix tumours using interstitial CT-MRI Utrecht applicator.

Material and Methods: Retrospective review of the records of 122 cervical cancer patients treated in our institution from