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Purpose/Objective

Background:

Bladder preservation combining surgery and radiotherapy could maintain quality of life without compromising tumor control in selected patients with bladder carcinoma. Several reports confirm good results. Prognosis of patients presented with recurrence after primary treatment with this regimen is not well known.

We report the long term results of treated recurrences after bladder preservation treatment with brachytherapy.

Materials and Methods: Between 1989 and 2011, 192 selected patients with muscle-invasive bladder cancer were treated with a combined regimen of preoperative external radiotherapy, and subsequent surgical exploration with or without partial cystectomy and interstitial brachytherapy. Data of patients presenting with local recurrence after this regimen were retrospectively collected. The primary end points were local recurrence-free survival (LRFS) and overall survival (OS) (after the treatment of recurrence). Complications of the secondary treatment were reported.

Results: The median follow-up after primary treatment was 105 months (6-212 months). In 40/192 (20.8%) patients a local recurrence was detected. Four patients were excluded because of lack of data.

Treatment of the local recurrence was performed in 28/36 (78%) patients. For 18 patients a salvage cystectomy was performed; 10 patients were treated with transurethral resection followed by intravesical BCG. In 4 patients cystectomy procedures were discontinued.

The local recurrence was muscle invasive in 19 patients; mostly treated by salvage cystectomy (14/19). The LRFS after the treatment of recurrence was 70% and 55% after 2 and 5 years, respectively. The OS 2 and 5 years after treatment was 71% and 34%, respectively. The LRFS of the 18 patients treated with salvage cystectomy 71% after 2 years as well 5 years and the OS was 67% and 36% after 2 and 5 years, respectively.

In 11/18 (61%) patients treated with cystectomy, surgical complications were reported, 6/11 patients with Clavien Dindo complications grade ≥ 3 .

Conclusions: The LRFS of patients treated for local recurrence after bladder-sparing regimen using brachytherapy offers good long-term oncological outcome. Salvage cystectomy gave the best long term local control, unfortunately with more surgical complications.

OC-0040

Risk adapted interstitial brachytherapy for breast cancer treatment: analysis of a single institution results

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Purpose/Objective: Interstitial multicatheter brachytherapy is the most frequently used technique of partial breast irradiation, and could be used to deliver surgical bed boost and moreover exclusively accelerated partial breast irradiation (APBI). Our purpose is to evaluate our clinical results using both options of high dose rate (HDR) brachytherapy, in a risk adapted way.

Materials and Methods: Between 1999 and 2014, 276 breast cancer patients has been treated with brachytherapy in our institution, with a mean follow-up of 65 months. It has been

used as a boost combined with external beam radiotherapy (EBRT) in 125 patients with a median dose of 8 Gy in tumorectomy bed added to conventional doses of EBRT (50 Gy). In the others 151 patients it has been delivered as exclusive APBI, with a dose of 32 Gy separated in 8 fractions of 4 Gy. ASTRO and GEC-ESTRO APBI recommendations has been registered for every patient.

Results: The mean age at diagnosis was 61.67 years (range: 24-92), 80.4% presented a postmenopausal status, in 82% tumor size was < 2 cm, 47 % grade I, 35% grade II and 13% grade III. Using APBI GEC-ESTRO recommendations, patients were classified as low risk in 41%, intermediate risk 21% and high risk 38%. For the ASTRO criteria, patients were classified as suitable 31%, cautionary 37% and unsuitable 32%. Most intermediate and high risk patients treated with APBI were elder than 70 years or they lived far from our institution.

With a mean follow-up of 65 months (range: 4-179), actuarial local disease free survival was 98.1% at 5 years and 94.1% at 10 years. Actuarial cause specific survival was 96.8% at 5 years and 94.2% at 10 years. Five years and 10 years actuarial overall survival were 90.1% and 85.7% respectively.

For the whole group, the best risk fit was obtained using GEC-ESTRO recommendations for APBI, with a local disease free survival at 5 and 10 years of 100% for those patients with low risk of recurrence.

Conclusions: HDR risk adapted brachytherapy represents a good approach in breast cancer conservative treatment in terms of local control and survival. GEC-ESTRO recommendations has demonstrated to be a good tool to select patients treatment option.

OC-0041

PBI with interstitial high-dose-rate brachytherapy: results of a phase II prospective study

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Purpose/Objective: To investigate the outcome after PBI with ¹⁹²Ir interstitial HDR brachytherapy in patients with early breast cancer.

Materials and Methods: From August 2003 to May 2014 260 patients aged 42-85 years (median 67) were enrolled. There were 237 infiltrating tumors and 23 DCIS (median tumor size 9 mm, range 1.25-28) ER and PgR were positive in 236 and 210 cases respectively. Axillary nodes were negative in 257 patients; 3 patients had the sentinel positive node, 1 with micrometastasis. 29 patients received adjuvant chemotherapy, 221 hormonal therapy. Treatment schedule was 4 Gy twice a day for 4 days, up to a total dose of 32 Gy with an interval between fractions of at least 6 hours. Survival was analyzed by Kaplan-Meier estimator. Cosmetic results were evaluated, using the Harvard criteria, by radiation oncologists and patients, Cohen's k-test of inter-rater agreement (k-value ranging from 0 to 1) estimated concordance between patients and physicians.

Results: Median follow-up was 74 months (range 2-128). Four local relapses (1.5%) were observed 12, 24, 48, 96 months after PBI. One regional relapse was observed in the

supraclavicular and axillary nodes 7 months after PBI in a patient with negative sentinel node. Nine patients developed distant metastases, 16 patients a contralateral breast cancer and 35 patients a second primary cancer. At the last check-up 240 patients were alive: 238 with no evidence of cancer, 2 with metastatic breast cancer. 15 patients died: 4 of metastatic breast cancer, 5 of another cancer, 3 of different causes. The 5-year probability of breast relapse-free survival, nodal relapse-free survival and cause specific-free survival were 98.1% (95% CI: 96.3-100) 99% (95% CI: 97.7-100) and 99.5%(95% CI: 98.4-100) respectively. Acute toxicity occurred in 95 patients and late toxicity in 85 patients. From different risk factors for toxicity (age, tumor size, hormonal therapy, chemotherapy) only tamoxifen, was significant factor for late toxicity ($p < 0.0001$). Cosmetic results were excellent/good in 250 patients, fair in 6, unknown in 4. Overall inter-rater agreement by physicians and patients on cosmesis was good (K value: 0.67).

Conclusions: Our data demonstrate that PBI with ^{192}Ir interstitial multi-catheter HDR brachytherapy is associated with a relapse rate comparable to the best published results and low late toxicity.

Poster Discussion: An anthology of clinical posters

PD-0042

APBI versus whole breast irradiation in women age 70 years or older: a subgroup analysis of a phase 3 randomised trial

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Purpose/Objective: Incidence of breast cancer (BC) is increasing in the elderly population because of the increase in life expectancy and the diffusion of screening trials. Even in patients with BC of excellent prognosis, ipsilateral breast tumour recurrence (IBTR) after conservative surgery without adjuvant therapy is still very high. IBTR was reduced by either radiotherapy (RT) or hormonal therapy but to a greater extent by the receipt of both treatments. Whole breast irradiation (WBI) remains the standard of care after conserving surgery but the management of adjuvant radiation therapy in the elderly has become a medical challenge because of the poor compliance of patients to conventional RT. We analyzed the recurrences rate and the safety profile of a subset of patients age 70 years or older of a phase 3 trial comparing APBI and WBI.

Materials and Methods: The trial enrolled 520 women aged more than 40 years affected by early BC, with a maximum pathological tumour size of 25 mm. Patients were randomly assigned in a 1:1 ratio to receive either WBI or APBI using IMRT. The APBI arm received a total dose of 30 Gy to the tumour bed in 5 daily fractions. The WBI arm received 50 Gy in 25 fractions, followed by a boost of 10 Gy in 5 fractions. The primary endpoint was occurrence of IBTR; this trial is registered with ClinicalTrials.gov, number NCT02104895.

Results: A total of 114 patients aged more than 70 years were analysed (58 in the WBI arm, 56 in the APBI arm). Most patients had pathological T1 stage (86%), nuclear grade G1-2 (73.2%), positive hormonal status (94.7%), negative HER2 status (83.3%), and luminal-A molecular subtype (74.6%); all these features were well balanced between the two arms. At a median follow-up of 5.0 years (range 3.4-7.0), the IBTR rate was 2% (one case) in the APBI group and 1.9% in the WBI group (one case). No significant difference emerged between the two groups (log rank test $p = 0.93$). The APBI group presented significantly better results considering acute skin toxicity ($p = 0.0001$). Major recorded events and safety profile of this subgroup of patients were presented in *Table 1*.

Table 1. Skin toxicity, physician-rated cosmesis and major recorded outcome events.

	WBI (n:58)		APBI (n:56)		p-value
	N	%	N	%	
Acute skin toxicity					
None	21	36.2	45	80.4	0.0001
Yes, any Grade	37	63.8	11	19.6	
None	21	36.2	45	80.4	0.0001
Grade 1	19	32.8	11	19.6	
Grade 2	15	25.9	0	-	
Grade 3	3	5.1	0	-	
Grade 4	0	-	0	-	
Late skin toxicity					
None	50	86.2	54	96.4	0.094
Yes, any Grade	8	13.8	2	3.6	
None	50	86.2	54	96.4	0.094
Grade 1	8	13.8	2	3.6	
Grade 2	0	-	0	-	
Grade 3	0	-	0	-	
Grade 4	0	-	0	-	
Physician-rated cosmesis					
Excellent	52	89.7	51	91.1	1.0
Good	6	10.3	5	8.9	
Fair	0	-	0	-	
Poor	0	-	0	-	
5 years rate events					
IBTR	1	1.9	1	2.0	0.93
Local relapse	1	1.9	0	0	0.35
New ipsilateral BC	0	0	1	2.0	0.29
Locoregional Relapse	2	3.9	1	2.0	0.64
Contralateral BC	2	4.2	0	0	0.17
Distant metastases	1	2.3	1	2.1	0.95
Total deaths	4	8.6	0	0	0.054
Breast cancer	0	0	0	0	
Other cause	4	8.6	0	0	0.054

Conclusions: Our results confirmed the low rate of IBTR in this subgroup of patients, which could benefit in terms of quality of life in a reduction of irradiated volume. Omission of WBI after conservative surgery in elderly is still controversial, according to the indolent behaviour of BC in these patients. Further investigations are strongly needed to select a subset of tumours of excellent prognosis, such as luminal A, to treat with exclusive APBI or hormonal therapy.

PD-0043

2-year cosmetic outcome of large breasted women randomized between prone and supine whole-breast irradiation

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Purpose/Objective: To report 2-year cosmetic outcome of a randomized trial comparing prone and supine whole-breast irradiation (WBI) in large breasted patients
Materials and Methods: Between December 29, 2010, and December 12, 2012, 100 patients with at least a (European) cup size C presenting for WBI were randomized between supine multi-beam and prone tangential field intensity modulated radiotherapy. All patients were treated to 40,05 Gy in 15 fractions, followed by a boost of 10 Gy in 4 fractions if indicated. Digital photographs were taken in standard conditions before and 2-year after radiotherapy with markers on the nipples, the suprasternal notch and the xyphoid. A photograph was taken with the arms alongside the body one with the arms up. Cosmesis was objectively scored using the commercially available BCCT.core software of the INESC Porto Breast Research Group (1). A subjective scoring was done by 3 observers on a 4-point scale: excellent - good - fair - poor. The difference in cosmesis was analyzed with 0 - no difference or better cosmesis, 1 - cosmesis one category