

Material and Methods

This retrospective study reported the carcinologic and functional results of patients (pts) presenting a cT2/T3 NOMO operable IBC, treated by a conservative strategy. Treatment consisted of a transurethral resection, as complete as possible, followed by concomitant bifractionated split-course chemoradiation (CCR) with 5FU-Cisplatin chemotherapy. A control cystoscopy was performed 6 weeks after the first part CCR (eq45Gy) with systematic biopsies. Pts with complete histologic response achieved CCR protocol. Salvage surgery was proposed to pts with persistent tumor.

Results

313 patients (83% cT2, 17% cT3) treated between 1988 and 2013 were included in this study, with a median follow-up of 59 months and 67 year mean age. After the first part of CCR histologic response rate was 83%. After 5 years, overall, disease-free, metastasis-free and functional bladder-intact survival rates were respectively 69%, 61%, 78% and 69%, significantly better for patients in complete response after induction CCR (77% vs 32%, p= 0,001 for 5 years OS). Late urinary and digestive toxicities were limited, with respective rates of 3.2% and 1.3% of grade 3 toxicity.

Conclusion

Chemoradiation after transurethral resection is a good treatment option, especially for older or frail pts.

EP-1588 The preliminary result of combination of chemoradiotherapy and arterial infusion for bladder cancer

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Purpose or Objective

We present the preliminary results from our clinical study evaluating the effectiveness of combination of chemoradiotherapy with balloon-occluded arterial infusion (BOAI) and hemodialysis (HD) for bladder cancer

Material and Methods

We investigated 200 patients and the median age was 66 (range; 32-85) . According to the UICC classification, 4 patients were at clinical stage Tis, 19 at T1, 120 at T2, 40 at T3, and 17 at T4. About N stage, 167 patients had no lymph node metastasis. All patients received external beam radiation therapy (EBRT) of 40- 50 Gy to the whole pelvis with 10 Gy to the bladder as a boost. During EBRT, combination chemotherapy of gemcitabine (GEM) and cisplatin (CDDP) was described. After chemoradiotherapy, BOAI of CDDP was administered from bilateral internal iliac arteries with simultaneous HD to prevent back-flow of CDDP into the systemic circulation.

Results

The median follow-up time was 38 months(range; 4-58). Complete response (CR) rate was 78% after 2 months of treatment. Three-year local control (LC) and overall survival (OS) rates were 72% and 87%, respectively, and 3-year bladder preservation rate was 99%.Grade 3 acute complication occurred in 25 patients (13%) (genitourinary: 9; gastrointestinal: 17) and Grade 4 acute complication was not observed.

Conclusion

Combination of chemoradiotherapy with BOAI and HD may be regarded as a curative therapy for patients with bladder cancer.

EP-1589 Establishing international variation in target delineation using MRI for bladder radiotherapy.

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Purpose or Objective

MRI has an established diagnostic role in local staging of muscle invasive bladder cancer (MIBC). Improved soft tissue definition with MRI compared to CT should facilitate radiotherapy target definition. However, experience of MRI in bladder radiotherapy planning is limited, with no current guidance available on its use. This multicentre, international study aims to establish current inter-observer variability of target delineation for MIBC using MRI in order to develop future consensus.

Material and Methods

24 participants with a specialist interest in MIBC (19 radiation oncologists, 2 radiologists and 3 treatment radiographers) from 15 institutions (11 UK, 1 Danish, 2 Australian, 1 Canadian) were provided with MRI scans of 3 patients with MIBC. One CT based case was also included. Consultant radiation oncologists also completed a questionnaire on their MIBC radiotherapy experience and MRI use. Case vignettes were given but participants were not coached on MRI or CT interpretation. CTV and GTV delineation was performed on T2W images and outer bladder wall (BW) delineation completed on T1W images. Diffusion weighted images were also available for reference. For the CT benchmark case, only CTV and GTV were defined. Delineation was carried out on the MONACO treatment planning system research version v5.10 (Elekta AB, Stockholm, Sweden).

On completion of all contours a Simultaneous Truth and Performance Level Estimate (STAPLE) was created for each structure set. Individual contours were compared to this, enabling inter-observer comparisons. Four variability tests were performed using ADMIRE research version v2.0 (Elekta AB, Stockholm, Sweden).

Results

Participating consultant radiation oncologists had a median 10 years of experience (IQR 7-15) in MIBC radiotherapy. Use of MRI in the radiation pathway was mixed, 53% (9/17) of clinicians had access to diagnostic MRIs, 18% had access to radiotherapy planning MRs, while 41% did not routinely use MR in their radiotherapy pathway.

In total, 264 contours were completed, of which 2 could not be analysed due to technical reasons.

Table 1 shows the combined median variability indices across the MRI based cases with the CT based case as a comparator.

Variability Index	MRI GTV	MRI CTV	MRI Bladder Wall	CT GTV	CT CTV
Median DICE coefficient (IQR)	0.69 (0.59-0.76)	0.94 (0.94-0.95)	0.95 (0.93-0.96)	0.70 (0.6-0.8)	0.97 (0.97-0.97)
Median Cohen Kappa (IQR)	0.65 (0.54-0.73)	0.91 (0.90-0.92)	0.91 (0.89-0.93)	0.67 (0.57-0.78)	0.95 (0.94-0.95)
Median Hausdorff Distance (mm)	15.04 (11.99-30.3)	7.70 (6.27-11.22)	7.95 (6.39-10.29)	12.12 (9.83-14.47)	4.02 (3.51-5.19)
Median mean distance (mm)	3.08 (1.80-6.38)	1.22 (1.07-1.43)	1.43 (1.06-1.75)	2.21 (1.13-2.98)	0.60 (0.57-0.71)

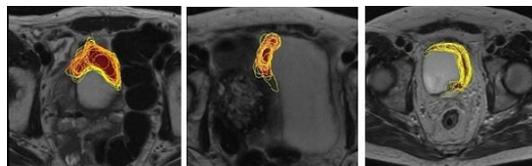


Figure 1 GTV inter-observer variation on T2 image. L-R cases 1-3, STAPLE in red colourwash, participants yellow contour

Conclusion

Current use of MRI in MIBC radiotherapy is mixed. Some institutions have access to MRI for the majority of their patients, others have restricted or no access to these scans.

Despite this, MRI delineated volumes on average show reasonable concordance between participants, this is similar to CT where there is greater experience. Greatest variance was seen in GTV delineation with a median DICE of 0.69.

Further work will now include an education/consensus meeting followed by the production of guidance for the proposed use of MRI in MIBC radiotherapy target delineation with particular attention paid to GTV boost volume delineation.

EP-1590 Hyperthermia-radiotherapy in frail bladder cancer patients unfit for cystectomy or chemoradiotherapy

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Purpose or Objective

Radiotherapy (RT) combined with radiosensitizers such as chemotherapy (CRT) or hyperthermia (HTRT) with curative intent shows superior local tumour control (LC) compared with RT alone in muscle-invasive bladder cancer (MIBC). We aimed to evaluate the LC rate, overall survival, MIBC-specific survival, acute and late toxicity of RT with concomitant deep hyperthermia (HT) in MIBC patients who are too frail for or decline radical cystectomy (RC) or CRT.

Material and Methods

From 12/2012 to 03/2018 we treated 17 patients with unifocal or multifocal MIBC (T1-4, cN0-1, cM0, G3) with HTRT after maximal TURBT. Multifocal MIBCs received 50 Gy/20 fx (5x/week) to the whole bladder. Unifocal MIBCs were treated with 36 Gy/12 fx (3x/week) to the full bladder and a 12 Gy/4 fx boost (once a week) to the resected tumour region to a total of 48 Gy/16 fx (4x/week). HT was delivered weekly over 60 minutes with a mean temperature of 41.3°C using a BSD-2000 applicator. LC was assessed by cystoscopy every 3 months if possible.

Results

One patient did not tolerate HTRT and was excluded from the analysis. Thus 16/17 patients (94.1%) completed HTRT

as per protocol. The median age in these 16 patients (6 unifocal, 10 multifocal) was 81 years (range, 52 - 88 years) while the median age-adjusted Charlson comorbidity index was 5 (range 1 - 9). LC was achieved in 100% (12/12) of patients at 3 months and in 87.5% (7/8) of patients at 12 months (Tab. 1). Median cystoscopic follow-up was 7.5 months (range, 2 - 59 months). Two local recurrences were detected. One local relapse was a noninvasive papillary carcinoma (pTa) at 9.5 months, which was successfully salvaged by TURBT. The other relapse presented at 17 months with lymph node and bone metastases. MIBC-specific survival during follow-up was 100%. Overall survival at 1 year was 71.4% (95% CI 47.7% - 95.1%) (Fig. 1). Grade 3 gastrointestinal (GI) and genitourinary (GU) toxicity (CTCAE v4.0) was evident in 12.5% (2/16) patients while none had grade 4 toxicity. During follow-up, only one grade 3 (CTCAE v4.0) late toxicity occurred. This was a transient episode of macrohematuria under anticoagulation due to bladder telangiectasia and was locally treated by coagulation. Bladder function was well preserved in all patients.

Assessed at 3 months

Patients available:	12/16 (75%)
not available due to:	<ul style="list-style-type: none"> • 2/16; not yet reached follow-up timepoint • 2/16; unable for cystoscopy due to health deterioration
Local control:	12/12 (100%)

Assessed at 12 months

Patients available:	8/16 (50%)
not available due to:	<ul style="list-style-type: none"> • 3/16; not yet reached follow-up timepoint • 1/16; declined further cystoscopic follow-up • 4/16; died (not MIBC-related)
Local control:	7/8 (87.5%)
	• 1/8 with recurrence at 9.5 months

Tab. 1. Cystoscopic local disease control

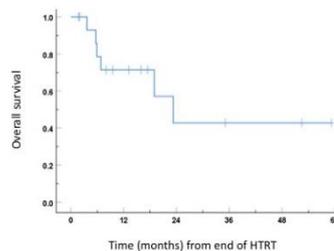


Fig. 1. Kaplan-Meier plot for rates of overall survival

Conclusion

Elderly, polymorbid patients with MIBC have limited therapeutic options. To preserve quality of life, treatment achieving LC with a minimum of adverse effects is required. Several hypofractionated RT schedules have been reported for this population group, but this is the first report of RT combined with HT as radiosensitizer. Our results showed good tolerance of HTRT, minimal late toxicity and an excellent LC. These data are comparable or even better than those from hypofractionated RT alone in this population of frail patients unfit for definitive surgery or CRT.

EP-1591 Dose mapping local failure following radical image guided bladder radiotherapy

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