

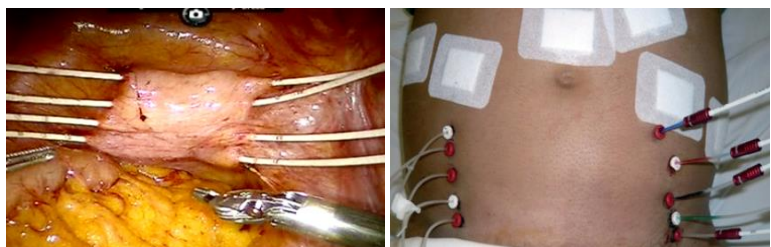
Good functional outcomes after bladder preserving robotic surgery, with or without partial cystectomy, and brachytherapy for muscle-invasive urothelial cell carcinoma of the bladder.



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Bladder preserving surgery, in combination with external beam radiotherapy and interstitial radiotherapy (=brachytherapy), results in good oncological outcomes: in our series 5-yrs local control rate of 82%, in selected patients with muscle invasive urothelial cell carcinoma of the bladder (MIBC). Inclusion criteria for brachytherapy are a solitary tumour, <5cm, N0 and no CIS. Radiotherapy on the bladder is associated with an increase of LUTS and potential loss of bladder function. Bladder preserving therapy is only profitable over cystectomy if bladder function remains satisfactory for the patient. In this study we evaluate the influence of robot-assisted minimal invasive surgery plus brachytherapy on bladder symptoms and bladder function compared to the situation before brachytherapy treatment.

From 2009-2017 all patients undergoing bladder preserving brachytherapy for MIBC were included in the study. Data on functional outcomes (degree of nocturia, use of anticholinergics postoperatively and functional bladder outcome during follow-up cystoscopy) were collected. The treatment regime consisted of external beam radiotherapy (20x2Gy, in 4 weeks) on the bladder and regional lymph nodes, followed after 1 week by a robot-assisted, laparoscopic or converted (N=2) brachytherapy catheter placement under simultaneous cystoscopic control with or without partial cystectomy. Afterloading with radiotherapy started immediately after surgery in a clinical setting with in general 10x2.5Gy over 3 days.



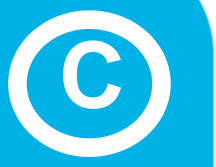
Interpretation of results

In the majority of patients studied, functional bladder capacity after robotic minimal invasive surgery plus brachytherapy (with or without partial cystectomy) appeared to be very good. Furthermore, most patients showed an improvement or comparable degree of nocturia pre- and postoperatively. Only a few patients requested anticholinergic therapy because of worsening of bladder symptoms after brachytherapy.



	Value (spread)	No of pts/total pts (%)	
Freq of nocturia before BT (total)	1.67 times (0-4)	60/95 (63.2%)	
Freq of nocturia after BT (total)	1.51 times (0-6)	60/95 (63.2%)	P = 0.15
Freq of nocturia before / after BT (only with PC)	NA	NA	P = 0.39
Improvement or no difference in frequency of nocturia pre- and post BT	NA	43/60 (71.7%)	
Worsening frequency of nocturia pre- and post BT	NA	17/60 (28.3%)	
Use of anticholinergics	NA	5/95 (5.3%)*	
FBC after therapy (solely BT)	362.2 ml (200-450)	40/60 (71.7%)	
FBC after therapy (PC + BT)	357.7ml (200-500)	17/60 (28.3%)	P = 0.89
Symptomatic ulcers	NA	3/95 (3.2%)	

*1 pt with indwelling catheter, 2 pts received BCG instillations due to secondary NMIBC during follow up
 BT = brachytherapy, PC = partial cystectomy, NA = non applicable, FBC = functional bladder capacity



This is the first study showing the positive functional outcomes of Robot-assisted brachytherapy for MIBC in a large study population. More studies on the functional outcomes of brachytherapy are required to support the current positive findings. Ideally, functional outcomes should also be monitored using questionnaires on LUTS and quality of life before and after treatment to evaluate patient satisfaction. Furthermore, long term results are desirable to investigate preservation of bladder function even years after brachytherapy since radiation therapy effects can sometimes be seen many years after initial treatment. Nevertheless, functional outcomes in our study proved to be that satisfactory that robot-assisted minimal invasive surgery plus brachytherapy has to be considered a real alternative for cystectomy in oncologically justified selected patients.

