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Performance of bladder wash cytology during surveillance of non-muscle-invasive bladder cancer in a contemporary patient cohort

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BACKGROUND

- Bladder wash cytology (BWC) is widely used as an adjunct investigation for non-muscle invasive (NMI) bladder cancer (BC) surveillance.
- Traditionally, a high specificity has been reported.
- However, more recent data revealed a less optimistic performance of BWC particularly for low-grade BC.
- We aimed to assess the performance of BWC in daily clinical practice in a contemporary patient cohort followed for NMIBC.

MATERIALS AND METHODS

- We analyzed 2064 BWC's derived from 315 patients followed for NMIBC in a tertiary care academic center between 2003 and 2013.
- All patients were followed using a combination of cystoscopy and BWC.
- Patients with either positive cystoscopy or BWC underwent bladder biopsy. Patients with both negative cystoscopy and cytology were followed.
- All cytologies were performed by a specialized pathologist.
- BWC was considered positive if malignant cells were reported (strict positive).
- The same analysis was performed with an extended definition of positive cytology (defined as presence of either suspicious, atypical or malignant cells).
- Sensitivity (SE), and specificity (SP) were calculated overall, for low-grade (LG) and high-grade (HG) tumors.
- In addition, the influence of postoperative BCG treatment on BWC performance was also assessed (Breslow-Day test).

RESULTS

- Baseline patient characteristics are shown in Table 1. Mean number of BWC performed per patient was 5.6 (± 4.5).
- A total of 95 recurrences were detected (Table 2).
- Overall, LG and HG BWC performance for strict positive and extended positive analysis are displayed in Table 3.
- False negative cystoscopy was observed in only 19 cases (0.9%). Applying extended positive analysis for BWC detected 17 of these cases. (Table 4). Performance was influenced by postoperative BCG treatment only if extended positive BWC was used (p=0.003).

1) PATIENT CHARACTERISTICS

Number of patients (n)	314	
- Male	253	(80.6%)
- Female	61	(19.4%)
Age (y, range)	67	(SD±16)
Primary tumor stage		
- pTa	206	(65.6%)
- pT1	98	(31.2%)
- CIS	10	(3.2%)
Primary tumor grade (2004 Classification)		
- LG	156	(49.7%)
- HG	158	(50.3%)
Concomitant CIS		
- Yes	43	(13.7%)
- No	271	(86.3%)

2) MODE OF DETECTION

Total Recurrences	95	
Cystoscopy only	41	(43.2%)
Cytology only	12	(12.6%)
- Strict positive	2	
- Extended positive	10	
Cystoscopy/Cytology intersection	35	(36.8%)
Biopsy only	2	(2.1%)
Biopsy/Cytology intersection	5	(5.3%)

3) BWC PERFORMANCE

	Sensitivity (%)	Specificity (%)
Strict positive		
- Overall	16.8	99.7
- LG	13.3	100
- HG	20.0	99.5
Extended positive		
- Overall	54.7	94.2
- LG	35.6	95.3
- HG	72.0	93.3

4) FALSE NEGATIVE CYSTOSCOPY

False negative cystoscopy		**19 (0.9%)**	
- LG		3	
- HG		16	
Strict positive:		**Extended positive:**	
BWC positive	3 (15.8%)	BWC positive	17 (89.5%)
- LG	1	LG	2
- HG	2	HG	15
BWC negative	16 (84.2%)	BWC negative	2 (10.5%)
- LG	2	- LG	1
- HG	14	- HG	1

CONCLUSION

- Our analysis revealed large differences in SE depending on the applied criteria for a positive test.
- Extended criteria increase the SE, while keeping the SP almost constant.
- Overall, the benefit of BWC remains questionable, especially in the surveillance of NMIBC.

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