

Exfoliative Cytodiagnosis as a Screening Test in Bladder Tumours*

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SUMMARY

A retrospective evaluation of patients afflicted with tumours of the bladder shows that exfoliative cytology of the urinary sediment can be recommended for early diagnosis of latent tumours of the bladder, particularly of malignant papilloma and carcinoma; early diagnosis of malignant degeneration of benign bladder papilloma; and early diagnosis of a recurrence of bladder tumour after a bladder operation. It is a simple method with great diagnostic value both in the clinic and in urological practice.

S. Afr. Med. J., 45, 1219 (1971).

Exfoliative cytodiagnosis has proved its worth as a screening test in diagnosing tumours of the bladder. Early recognition of carcinomatous initial stages, the classification of manifest tumours, and the early diagnosis of a recurrence during check-up examinations become possible. A series of latent tumours in the entire urogenital tract can be diagnosed at an early stage if the exfoliative cytodiagnosis is used as an additional routine examination with every urinalysis.

MATERIALS

Since 1963, about 3 200 urinary sediments have been cytologically evaluated. The following methods were applied: simple phase-contrast microscopy; Loeffler's methylene-blue staining test;¹ Papanicolaou-staining,² and acridine-orange fluorescence.³ The indications for cytodiagnosis of freshly voided urine were:

- All forms of macro- and microhaematuria.
- Unexplained dysuria and cystalgia.
- Suspicion of a tumour in the urogenital tract.
- Cystoscopically confirmed bladder papillomas (suspected of being malignant).
- Control of tumour recurrence in patients with operated bladder tumours.

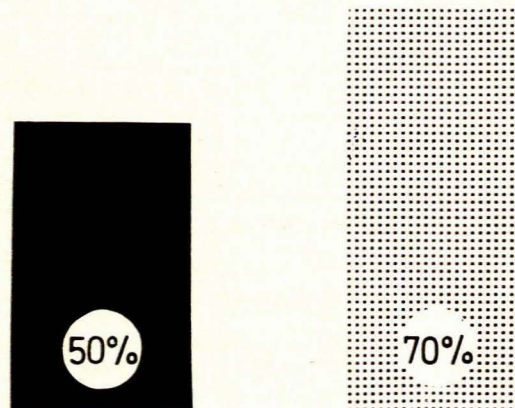
Not less than 3 slide smears were made of the sediment of spontaneously voided urine. Where a tumour was suspected clinically and the cytological findings were negative, the examination was repeated on two subsequent days.

RESULTS AND DISCUSSION

The first cytological examination yielded a positive result in 50% of the cases when the cystoscopic findings were

positive. Following the second or third examination of the sediment, the cytological positive result rose to 70% (Fig. 1). A 70% diagnostic reliability after the second and

POSITIVE CYTODIAGNOSTIC RESULTS



I. EXAMINATION II./III. EXAMINATION

Fig. 1. Comparison of the correlations of a cystoscopically confirmed tumour of the bladder and the tumour-cytological urine findings. The sample consisted of 162 patients with bladder tumours of different histological structures.

third examination does not appear to be very high. However, if the different types of tumours are analysed and related to the diagnostic reliability of cytology, an entirely different picture is obtained. The negative cytological findings are clearly attributable to benign tumours of the bladder for, as a rule, they are cytologically inconspicuous. The histopathological classification of tumours and their correlation with the cytodiagnostic quota of dependability are reflected in Fig. 2.

Group I: Benign Papilloma

The diagnostic reliability quota of 11% in the first examination and 28% in the second and third examinations of the sediment is extremely low. The two major reasons are: the loss of cells or exfoliation from normal epithelium is very slight, and shed cells look exactly like

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normal epithelium of the bladder. If there are any inconspicuous epithelial cell formations, such as erythrocytes, in the bladder urine sediment and there is no calculus or infection of the urinary tract, these findings are suggestive of a papilloma. In diagnosing a benign bladder papilloma, cystoscopy is clearly superior to cytodiagnosis.

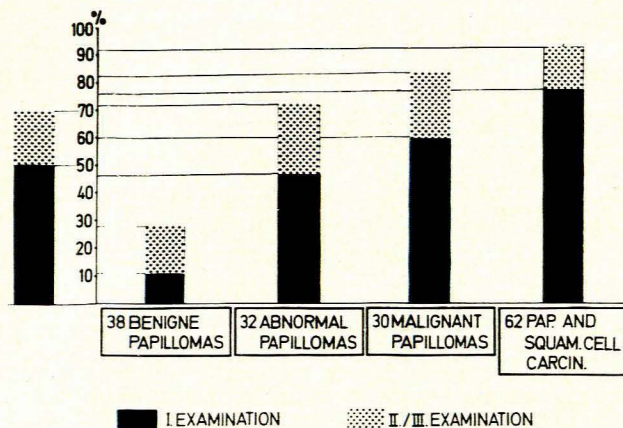


Fig. 2. Percentage of positive cytological results in correlation to histologically certified bladder tumours in a sample of 162 diagnosed tumours.

Group II: Atypical Papilloma

The reliability of cytodiagnosis is clearly higher with atypical papillomas, the quota for the initial examination being about 47%, and for the second and third examinations 72%. The diagnostic range is therefore effective. The malignant transformation often cannot be seen during cystoscopy. Sample excisions may under certain circumstances lead to an erroneously negative result if the malignant portion of the tumour was not removed.

Group III: Malignant Papilloma

In 30 patients malignant papillomas were diagnosed, which included also tumours where the borderline between a malignant papilloma and a papillary carcinoma was difficult to draw pathologically. Here the diagnostic quota rose to 60% after the first cytological examination, and to 83% after the second and third examinations.

Group IV: Carcinoma

Of 62 bladder carcinomas, 77% showed a positive cytological result at the first examination, which rose to 92% at the second and third examinations. Here the early diagnosis confirmed by cytodiagnosis is a substantial advantage compared with cystoscopy. We know that the beginning carcinoma of the bladder frequently manifests itself merely as a rawness of the mucosa, with reddening, vascularization and few ulcerous changes. Here again,

sample excisions were found to be of limited value only, while repeated cytological checks proved to have a diagnostic reliability of almost 100%.

If groups I and II are compared, it can be seen that the principal diagnostic value of exfoliative cytodiagnosis lies in the early recognition of the malignant papillomas and carcinomas. It should be added, however, that this division was established retrospectively, after histological confirmation of the type of bladder tumour.

One of the major advantages of cytodiagnosis is in the early diagnosis of a recurrent bladder tumour following a tumour operation. Ninety-six patients operated on for bladder tumours were checked both cystoscopically and cytologically. The findings have been correlated in Fig. 3.

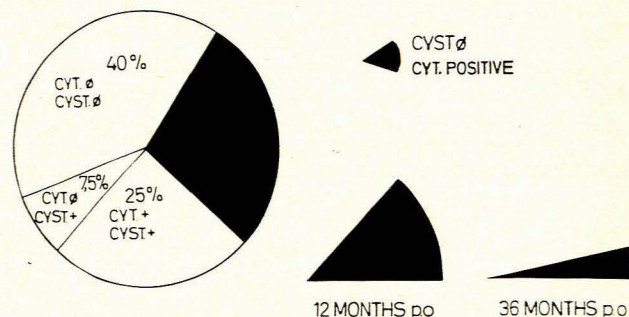


Fig. 3. Control of 96 patients with operated bladder tumours. Comparison of cytology with cystoscopy (542 controls).

Among the patients with a cystoscopically confirmed tumour recurrence, the first analysis of the urinary sediment showed 76% suspected clusters of tumour cells, and the second and third urinalyses as much as 90%, thus clearly showing the advantage of the multiple examination.

In a long-term postoperative follow up of 96 patients with bladder tumour the cystoscopic and cytological findings were correlated. Altogether 542 cytological and cystoscopic checks were compared. In 40% of the sample cystoscopy and cytology rendered negative results. In 25% the positive cytological findings agreed with the positive cystoscopic findings. In only 7.5% the cytology was negative and the cystoscopy positive. However, in 27.5% a negative cystoscopy was accompanied by a positive cytological result. This discrepancy between the positive cytological result and the negative cystoscopic result suggests that small tumour recurrences can not yet be cystoscopically diagnosed, if they become cytologically manifest. It is this group of cystoscopically negative and cytologically positive results that deserves long-term observation. After 12 months a cystoscopically negative result was found in only 12.5% and after 36 months in only 3.75%. Therefore, in bladder carcinoma the time intervals between the cystoscopic check-ups should not exceed 6 months.

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