Markers of Bladder Cancer

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For the urologist who is treating a patient with a flat or papillary lesion of the bladder, the most important question is whether the lesion will invade and/or metastasize. Traditionally, the criteria used to make a prognosis have been the multiplicity, size, and grade of the tumor. However, since most initial tumors are single, small, and of low grade, these criteria have not been reliable. In recent years, other methods of diagnosis have been explored and include imaging techniques, blood group isoantigens and other immunological procedures, DNA analysis with the use of flow cytometry or Feulgen stain, chromosome studies, morphometry, and correlation of urinary proteins with tumor stage.

However, to date, no specific marker has been found for transitional cell carcinoma (TCC) of the bladder. In addition, most of these approaches involve repeated cystoscopic examinations and removal of tissue for pathological study and often require hospitalization of the patient. Thus a procedure for analysis of the urine is needed that is simple, noninvasive, dependable, specific, and easily reproducible and that can guide the urologist in the care of the patient. If such an evaluation indicates a serious tumor, radical surgery in the earliest preinvasive stages of tumor development may be curative.

In 1986 Lance Liotta and co-workers identified a tumor autocrine motility factor (AMF) in a human melanoma cell line. In this issue, Liotta et al. report on a new, relatively simple, noninvasive assay for detection of AMF in urine as a marker for TCC of the bladder.

Having determined that the T24 TCC cell line responded to known AMF preparations and had a higher background of spontaneous motility compared with that of other cell lines, Liotta et al. chose the breast cancer cell line MDA-435s that had a much lower background motility for screening the urine samples. They determined the AMF contents of 24-hour urine samples from patients and compared them with samples from controls by the enzyme-linked immunosorbent assay (ELISA). The AMF content correlated with the grade of the tumor. The close correlation between the ELISA values and the motility values measured separately was indicative of a functional relationship between the antigen and motility stimulation. Thus the authors have demonstrated a correlation between the amount of AMF and the degree of invasiveness of the tumor. In addition, they have shown that the motility assay can reliably distinguish between tumor-free and TCC conditions in the follow-up of the patient, even though the urine sample from the patient is small.

Liotta et al. admit that the number of patients available for study was small. If the findings are confirmed by other laboratories and they hold true for a larger number of patients, the specificity and the simplicity of the procedure and the fact that it can be done on voided urine would make this one of the most valuable tests in the care of patients with cancer of the bladder.

1 Received August 29, 1988; accepted August 31, 1988.
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