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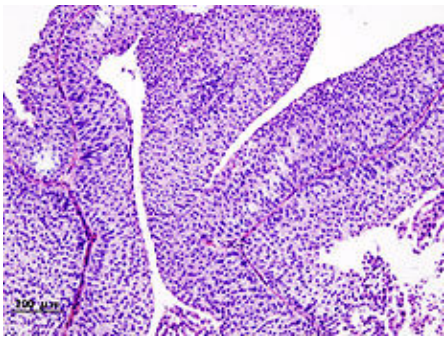
Bladder cancer



Bladder cancer refers to any of several types of malignant growths of the urinary bladder. It is a disease in which abnormal cells multiply without control in the bladder.[1] The bladder is a hollow, muscular organ that stores urine; it is located in the pelvis. The most common type of bladder cancer begins in cells lining the inside of the bladder and is called transitional cell carcinoma (sometimes urothelial cell carcinoma).

Signs and symptoms

Bladder cancer characteristically causes blood in the urine; this may be visible to the naked eye (gross hematuria) or detectable only by microscope (microscopic hematuria). Other possible symptoms include pain during urination, frequent urination (Polyuria) or feeling the need to urinate without results. These signs and symptoms are not specific to bladder cancer, and are also caused by non-cancerous conditions, including prostate infections and cystitis. Kidney cancer also can cause hematuria.

Causes

Tobacco smoking is the main known contributor to urinary bladder cancer: in most populations, smoking is associated with over half of bladder cancer cases in men and a sizeable proportion in women. There is a linear relationship between smoking and risk, and quitting smoking reduces the risk.[2] In a 10-year study involving almost 48,000 men, researchers found that men who drank 1.5L of water a day had a significantly reduced incidence of bladder cancer when compared with men who drank less than 240mL (around 1 cup) per day. The authors proposed that bladder cancer might partly be caused by the bladder directly contacting carcinogens that are excreted in urine. Thirty percent of bladder tumors probably result from occupational exposure in the workplace to carcinogens such as benzidine. 2-Naphthylamine, which is found in cigarette smoke, has also been shown to increase bladder cancer risk. Occupations at risk are metal industry workers, rubber industry workers, workers in the textile industry, and people who work in printing. Some studies also suggest that auto mechanics have an elevated risk of bladder cancer due to their frequent exposure to hydrocarbons and petroleum-based chemicals.[3] Hairdressers are thought to be at risk as well because of their frequent exposure to permanent hair dyes. A 2008 study concluded "specific fruit and vegetables may act to reduce the risk of bladder cancer."[4]

Diagnosis

The gold standard for diagnosing bladder cancer is biopsy obtained during cystoscopy. Sometimes it is an incidental finding during cystoscopy.[5] Urine cytology can be obtained in voided urine or at the time of the cystoscopy ("bladder washing"). Cytology is very specific (a positive result is highly indicative of bladder cancer) but suffers from low sensitivity (a negative result does not exclude the diagnosis of cancer). There are newer urine bound markers for the diagnosis of bladder cancer. These markers are not currently used routinely in clinical practice due to absence of clear professional guidelines. They are much more expensive as well. Many patients with a history, signs, and symptoms

suspicious for bladder cancer are referred to a urologist or other physician trained in cystoscopy, a procedure in which a flexible tube bearing a camera and various instruments is introduced into the bladder through the urethra. Suspicious lesions may be biopsied and sent for pathologic analysis.

Pathological classification

90% of bladder cancers are Transitional cell carcinoma. The other 10% are squamous cell carcinoma, adenocarcinoma, sarcoma, small cell carcinoma and secondary deposits from cancers elsewhere in the body.

CIS invariably consists of cytologically high grade tumour cells.

Staging

The following stages are used to classify the location, size, and spread of the cancer, according to the TNM (tumor, lymph node, and metastasis) staging system:

Stage 0: Cancer cells are found only on the inner lining of the bladder.

Stage I: Cancer cells have proliferated to the layer beyond the inner lining of the urinary bladder but not to the muscles of the urinary bladder.

Stage II: Cancer cells have proliferated to the muscles in the bladder wall but not to the fatty tissue that surrounds the urinary bladder.

Stage III: Cancer cells have proliferated to the fatty tissue surrounding the urinary bladder and to the prostate gland, vagina, or uterus, but not to the lymph nodes or other organs.

Stage IV: Cancer cells have proliferated to the lymph nodes, pelvic or abdominal wall, and/or other organs.

Recurrent: Cancer has recurred in the urinary bladder or in another nearby organ after having been treated. [6]

Bladder TCC is staged according to the 1997 TNM system:

Ta Non-invasive papillary tumour
T1 Invasive but not as far as the muscular bladder layer
T2 Invasive into the muscular layer
T3 Invasive beyond the muscle into the fat outside the bladder
T4 Invasive into surrounding structures like the prostate, uterus or pelvic wall

The nomenclature "G1", "G2" and "G3" refers to the degree of differentiation, or histopathological grade. "G1" superficial tumour is well differentiated, while a "G3" tumour is poorly differentiated.

Treatment

The treatment of bladder cancer depends on how deep the tumor invades into the bladder wall. Superficial tumors (those not entering the muscle layer) can be "shaved off" using an electrocautery device attached to a cystoscope. Immunotherapy in the form of BCG instillation is also used to treat and prevent the recurrence of superficial tumors.[7]

BCG immunotherapy is effective in up to 2/3 of the cases at this stage. Instillations of chemotherapy, such as valrubicin (Valstar) into the bladder can also be used to treat BCG-refractory CIS disease when cystectomy is not an option[8].

Untreated, superficial tumors may gradually begin to infiltrate the muscular wall of the bladder. Tumors that infiltrate the bladder require more radical surgery where part or all of the bladder is removed (a cystectomy) and the urinary stream is diverted. In some cases, skilled surgeons can create a substitute bladder (a neobladder) from a segment of intestinal tissue, but this largely depends upon patient preference, age of patient, renal function, and the site of the disease.

A combination of radiation and chemotherapy can also be used to treat invasive disease. It has not yet been determined how the effectiveness of this form of treatment compares to that of radical ablative surgery.

There is weak observational evidence from one very small study (84) to suggest that the concurrent use of statins is associated with failure of BCG immunotherapy.[9]

The hemocyanin found in *Concholepas concholepas* blood has immunotherapeutic effects against bladder and prostate cancer. In a research made in 2006 mice were primed with C. concholepas before implantation of bladder tumor (MBT-2) cells. Mice treated with *C. concholepas* showed a significant antitumor effect as well. The effects included prolonged survival, decreased tumor growth and incidence and lack of toxic effects.[10]

For a flow chart of the Bladder Cancer Treatment Guide, click the image:

http://upload.wikimedia.org/wikipedia/commons/2/28/Bladder_Cancer_Treatment_Guide_v4.png

Epidemiology

In the United States, bladder cancer is the fourth most common type of cancer in men and the ninth most common cancer in women. More than 50,000 men and 16,000 women are diagnosed with bladder cancer each year. One reason for its higher incidence in men is that the androgen receptor, which is much more active in men than in women, plays a major part in the development of the cancer.[12]

See also

BCG as a treatment for bladder cancer

References

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11. ^ "WHO Disease and injury country estimates". *World Health Organization*. 2009. http://www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html. Retrieved Nov. 11, 2009.
12. ^ "Scientists Find One Reason Why Bladder Cancer Hits More Men". University of Rochester Medical Center. 2007-04-20. http://www.urmc.rochester.edu/pr/news/story.cfm?id=1436.

External links

Bladder Cancer Surgery Video

American Bladder Cancer Society A site created for and by Bladder Cancer (BLC) survivors, people with symptoms and the people that care about them. A support group promoting education, awareness, and a discussion forum to help patients, survivors, and caregivers share information and get answers to questions.

Cancer.gov: bladder cancer

The Johns Hopkins Bladder Cancer Web Site

Bladder Cancer Webcafe Patient created site covering wide range of concerns

Bladder Cancer Advocacy Network (BCAN) Non-profit organization dedicated to improving public awareness and increasing research funding

Cancer.Net: Bladder Cancer

Bladder Cancer Treatment Options Podcast from the Medical University of South Carolina

European School of Urology: Management of Superficial Bladder Cancer An educational course of superficial bladder cancer

Medlineplus: Bladder Cancer

A massive aggregation of media articles and data collated by patients for patients & Forum for patients and carers

Retired Cancer Researchers Blog

"Special issue on bladder cancer". *Indian Journal of Urology* **24** (1). 2008. http://www.indianjurol.com/showbackissue.asp?issn=0970-1591;year=2008;volume=24;issue=1.