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Localized prostate cancer: Is brachytherapy better than other options?



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Brachytherapy (internal radiotherapy) is one of several treatment options in early-stage prostate cancer (localized prostate carcinoma). It involves implanting radioactive sources in the prostate gland, with the aim of specifically targeting the cancerous cells. This approach is called LDR or “low dose rate” brachytherapy. You can read more about brachytherapy in our fact sheet (URL: <http://www.informedhealthonline.org/index.303.en.html>).

The prostate is a walnut-sized gland that is part of the male reproductive system. It is located in front of the rectum (at the end of the bowel) and wraps around the urethra (urinary tube). In prostate cancer, cells of the gland change and become cancerous (malignant). Yet even if cancer cells are found, it does not mean that the illness will definitely cause problems or even lead to death. Prostate tumors often only grow slowly, or not at all, and do not always spread to other parts of the body and form metastases (secondary tumors). It is estimated that, in 8 out of 10 men with localized prostate cancer, the tumor neither grows nor spreads, and it does not become life-threatening. However, it is not possible to predict in which men the tumor will progress and in which it will not.

Treatment approaches in localized prostate cancer

The following options are available for the treatment of cancer that is confined to the prostate gland:

- Careful monitoring (also called “watchful waiting”): This strategy is based on the fact that prostate tumors usually only grow slowly or stop growing altogether. It is quite common for tumors to stay the same for years after being diagnosed. If the “watchful waiting” approach is chosen, the individual risk of the patient plays a role. It is important for the prostate gland to be checked regularly by a doctor.
- Conventional external radiotherapy (irradiated from outside the body). You can read more about this option in our fact sheet.
- LDR brachytherapy: This approach uses capsules the size of a grain of rice that release low levels of

radioactivity for a limited length of time (seeds). These seeds are implanted directly in the prostate using a hollow needle. The aim is to irradiate the tumor in a targeted way and avoid excessive damage to the surrounding organs (bladder and rectum). This is usually done under a general or local anesthetic. The seeds remain in the body after the course of therapy is complete, but the level of radioactivity continues to fall lower and lower.

- Prostatectomy: surgical removal of the whole organ including the seminal vesicles.

Comparing brachytherapy with other options

Researchers at the German Institute for Quality and Efficiency in Health Care (IQWiG) – the institute that publishes this website – compared the benefits of brachytherapy for localized prostate cancer to those of the other three treatment options. In order to evaluate the treatments, they looked for randomized controlled trials (RCTs) and other good studies that allowed a direct and fair comparison over relatively long periods of time. In RCTs participants are randomly divided into two or more treatment groups. These kinds of trial are the best way to assess the benefit of treatments. You can read more about this type of research here (URL: <http://www.informedhealthonline.org/index.61.en.html>).

The researchers found 31 trials, including one randomized controlled trial. But because many of the trials had flaws, no reliable conclusions could be drawn about the benefits and harms of brachytherapy. For example, various brachytherapy techniques were used in the different trials so it was difficult to compare the data directly. It was not possible to say anything about the long-term chances of survival after therapy. The researchers could only draw few conclusions about possible adverse effects.

There were no conclusive trials comparing the watchful waiting approach with brachytherapy. Some evidence suggests that, compared to conventional external radiotherapy, brachytherapy less often leads to adverse effects: there were fewer problems with rectal function after brachytherapy than there were after external radiotherapy. When compared to surgery (prostatectomy), the available research suggests that men had fewer problems with sexuality and urinary incontinence after brachytherapy. But they did more frequently have trouble

urinating after brachytherapy than after undergoing a prostatectomy. It was not possible to compare other adverse effects. It is also unclear how the various treatments affect quality of life.

At the moment it is not possible to draw definite conclusions about the benefits and harms of brachytherapy. This is especially true of patient survival, which can only be established in trials that include several years of follow-ups. The IQWiG researchers therefore urgently recommend that more good-quality clinical trials be carried out to allow more reliable conclusions about the effects of brachytherapy, particularly in terms of survival. In Germany there are already concrete plans to do such a trial comparing brachytherapy with other treatment options. It is to begin in 2011 and be completed in 10 years.

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Next planned update: February 2014. You can find out more about how our health information is updated in our text "Informed Health Online: How our information is produced" (URL: [http://www.informedhealthonline.org/our-methods.643.en.html?bab\[subpage_id\]=0-8](http://www.informedhealthonline.org/our-methods.643.en.html?bab[subpage_id]=0-8))

Note

This health information is a summary of a scientific report published by IQWiG. It is not an assessment of the right to have health care services reimbursed by statutory health insurance funds in Germany. By law, decisions about the reimbursement of diagnostic and therapeutic procedures can only be made by the German Federal Joint Committee (G-BA). The Federal Joint Committee takes IQWiG reports into consideration in its decision-making process. You can find information about the decisions of the German Federal Joint Committee on its English-language website, www.english.g-ba.de (URL: <http://www.english.g-ba.de/>).

Glossary

rectum

The rectum is the last 15 to 20 centimetres of the large bowel, that ends with the anus (back passage).

evidence

Evidence is what we call scientific proof from well-conducted, good-quality scientific trials that have been carefully designed to answer specific questions. Depending on the types of questions, different scientific research methods (types of study) are most appropriate to find reliable answers to these questions. Randomized controlled trials (RCTs), for example, are the best way to get reliable evidence on the effectiveness of medical treatments (interventions). This type of study, however, is not the best form of evidence for all possible questions, and does not provide the best answers to all kinds of questions, either. Epidemiological studies, for example, are very suitable for establishing well-founded proof for the spreading of a disease in the population.

bladder

The urinary bladder is the organ that collects urine before it is released from the body through the urethra. The urine passes from the kidneys to the bladder by travelling through tubes called ureters. An adult bladder can hold between 0.5 and 1 liter of urine (about 17 to 34 ounces), but the urge "to go" is usually already felt when there are smaller amounts of urine. The bladder can change in size depending on how much urine it is holding thanks to the muscles surrounding it. The urine is held back by sphincter muscles. When we urinate, the muscles of the bladder contract and the sphincter muscles relax, causing the bladder to open.

incontinence

Incontinence is the medical term for not having voluntary control over holding in stool or urine. The term is usually used to refer to urinary incontinence, where bladder control is impaired. There are different types of incontinence: Involuntary loss of urine when someone coughs or sneezes is called stress incontinence. This is mostly caused by a weak bladder outlet, as can happen in women who have weak pelvic floor muscles, for example. Neurological conditions such as multiple sclerosis or dementia, but also an enlarged prostate gland in men, may

cause what is called urge incontinence: this is where only small amounts of urine can be stored in the bladder before the urge to urinate is felt. Damage to the spinal cord, for example in people with paraplegia, affects the bladder's sphincter muscle directly. This is referred to as reflex incontinence.

Sources

Institute for Quality and Efficiency in Health Care (IQWiG). *Interstitial brachytherapy in localized prostate cancer. Final report N04-02 Version 1.0*. Cologne: IQWiG. January 2007. [Executive summary (URL: http://www.iqwig.de/download/N04-02_Executive_summary_Brachytherapy.html)] [Full text – in German (URL: http://www.iqwig.de/download/N04-02_Abschlussbericht_Brachytherapie.html)]

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The German Institute for Quality and Efficiency in Health Care (IQWiG)

The German Institute for Quality and Efficiency in Health Care (IQWiG) was established by legislation to provide evaluations of the effectiveness, quality and efficiency of healthcare services. This includes the assessment of medicines as well as the publication of health information for consumers and patients.

Evidence basis of our health information

Our information is based primarily on systematic reviews of the effects of health care. Systematic reviews are necessary to gain an objective picture of health care. In order to do this, a clear question is formulated. Researchers then find all the relevant studies that could answer this question. They then evaluate those studies.

You can find a list of the evidence and other scientific literature on which this information is based at [**www.informedhealthonline.org**](http://www.informedhealthonline.org)

Disclaimer

This information was prepared and published by the German Institute for Quality and Efficiency in Health Care (IQWiG). It is based on the evidence and other scientific literature available at the time of publication. The information is intended for the use of patients in Germany. It is not intended to for use to diagnose illnesses and the information is not intended to substitute for medical advice.