

IMG-99-002 - ULTRASOUND - 3D Ultrasound- Guided Method for Prostate Brachytherapy

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Technology description

An ultrasound image-guided system and method for obtaining an accurate knowledge of the 3-D geometry of the prostate; allowing for exact positioning of needles for the delivery of seeds to cancerous cells; and if necessary, a means to verify or correct the placement of an implant.

Description

Prostate brachytherapy is a type of radiation therapy where radiation “seeds” are strategically placed within the prostate gland or as close as possible to the tumor. Clinical data have shown prostate brachytherapy to be as effective as traditional surgery with fewer long-term side effects (e.g., incontinence, impotence). Original methods of prostate brachytherapy involved surgical exposure of the prostate gland followed by the freehand insertion of seeding needles. Aside from problems associated with the invasiveness of these approaches, a high rate of recurrence was observed within the treated area. Advancements in technology, in particular imaging, have greatly improved the quality of delivery techniques used for prostate brachytherapy. This invention concerns an ultrasound image-guided system and method for obtaining an accurate knowledge of the 3-D geometry of the prostate; allowing for exact positioning of needles for the delivery of seeds to cancerous cells; and if necessary, a means to verify or correct the placement of an implant. In comparison to earlier prostate brachytherapy protocols, that involve the scheduling of multiple outpatient visits, all necessary steps leading up to implantation of seeds can be performed in a single session. As a result, 3-D ultrasound-guided methods of prostate brachytherapy are considered more cost effective and safer than prior methods of performing these procedures.

Prostate cancer is one of the most common cancers occurring in males. Nearly 550,000 cases of prostate cancer have been diagnosed worldwide. Around 75% of these cases were in developed countries, where the incidence of prostate cancer is reported to increase by 10 to 15% every five years. Within the United States, approximately 210,000 new cases of prostate cancer are diagnosed each year, contributing to the death of an estimated 40,000 men. Approximately 60% of these cases can be treated with prostate brachytherapy. This represents the largest single market for the use of radioisotopes in therapy. On average, the estimated cost of performing prostate brachytherapy is between \$9,000 and \$15,000 per procedure. Taking into consideration the availability of other

treatment options that exist for prostate cancer (e.g., surgery, radiation, hormones, chemotherapy), the market that exists for prostate brachytherapy is estimated to be \$500 million. The size of this market is expected to increase with greater acceptance and further refinements in brachytherapy treatments for prostate cancer.

Institution

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