



Clinical-Medical Image

Evolution of Low-dose-rate Brachytherapy Imaging Equipment in the Prostate

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Short Communication

Low dose rate brachytherapy has traditionally been used to treat cancers of the prostate, head and neck, breast, cervical, endometrium, oesophagus, bronchial lesions [1]. Permanent implants have gained wide acceptance as a treatment modality for early stages of prostate cancer, without which the disease still remains confined to the prostate gland. Permanent placement of radioactive seeds with reduced half-life, emitting low-energy photons, is an option as a primary treatment. In the 1960s, physicians at the Houston College of Medicine [2] started implanting interstitial prostate brachytherapy. Brachytherapy, using 198-Au seeds, was performed alone or combined with teletherapy. These implants were performed by introducing themselves as sources (seeds) manually via the retro pubic route. In 1980, seed implants to be performed perennially using a template as a guide for applicators (needles) [3]. The method of using transrectal ultrasound for real-time visualization of needle and seed insertion was introduced by Holm HH et al. [4]. Transrectal ultrasonography (TSR), showing good accuracy with the real prostate weight, which is already well established in the literature [5-6]. The use of this tool as a guide has increased the accuracy of locating needles and seeds in the prostate. In addition, it is a method with wide availability in the most diverse centers, cheap and non-invasive, being recommended by the American Association of Physicists in Medicine [7]. Prostate seed implantation is performed in two steps. In the first step, the study of the volume of the prostate is carried out. The evaluation of this parameter is important to assist in the adequate surgical planning of patients, reducing the rate of complications, improving the results obtained and reducing the costs involved in the treatment [8]. The ultrasound probe is rigidly fixed in a stepper device such that, during the brachytherapy procedure, the probe can move longitudinally for specific distances and always remain in a fixed position [1]. Guide plates (templates) are kept rigidly and stably attached to the stepper. After the study, the planning is carried out by software where the quantity, orientation and positioning of the needles are decided; as well as the quantity and activity of the seeds, to determine the dose received by the tumour and healthy neighbouring tissues. In the second stage of brachytherapy, the seeds are implanted following the protocol established in the previous stage. Due to the importance of using the USTR, extensive training of the clinical staff is necessary for the expert handling of this tool.

Keywords: Brachytherapy; Prostate cancer; Low dose rate

Declaration of Interests

The authors declare that they have no competing interests.

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