Open cancer surgery set to become a thing of the past

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The surgeon's knife is playing an ever smaller role in the treatment of cancer, as it is replaced by increasingly efficient and safe radiation therapy techniques. Progress in radiation technology will also lead to better detection rates for cancer. This is according to Professor Freek Beekman, who will give his inaugural speech at Delft University of Technology on Wednesday, 24 September.

In his inaugural address, Kanker, krijg de straling , Professor Beekman says that radiation in the form of photons or particles is playing an increasingly important role in the detection and treatment of cancer. The low concentrations of radioactive molecules which gather in tumours, known as 'tumour seekers', show up well with techniques such as Positron Emission Tomography (PET) and Single Photon Emission Computed Tomography (SPECT). Such techniques mean that tumours can be discovered earlier more often than using X-rays, and it is also more often possible to ascertain properties of tumour cells without removing a sample of the tissue. Doctors can choose the best treatment for the individual patient more quickly and easily.

Destroying tumours by using radiation, rather than chemotherapy and operations, is also becoming an ever more common method of treatment and, Beekman says, the accuracy of this kind of therapy has improved considerably in recent years. When cancer is treated using external beams of radiation (as in radiotherapy), it is actually not only the tumour that is exposed to large amounts of radiation, but also any healthy tissue that is in the way of the beam. 'One example of a very powerful

emerging technique is the use of a radiation beam consisting of particles (protons), instead of photons. This kind of beam reaches its peak intensity at the site of the tumour. This greatly reduces radiation damage in healthy tissue around the tumour.'

Finally, it is increasingly possible to treat tumours internally, for example by using tumour seekers that emit particles and destroy the tumour on the spot. If this kind of treatment only reaches the tumour and avoids harming healthy tissue, it will make this method superior to proton therapy.

At Delft University of Technology, Beekman will focus particularly on improving medical instruments, such as the U-SPECT scanner he developed himself. This Ultra-high resolution Single Photon Emission Computed Tomographer has significant advantages over other scanning techniques. The challenge is now to make the U-SPECT more precise and more versatile and use it to create better tumour seekers. The U-SPECT is now only available for use with small laboratory animals, but a version for humans is in the design phase. The diagnosis and treatment of cancer could, according to Beekman, be greatly improved by sharper SPECT images of patients. Various tracers mean that metastases, for example, are visible more quickly. We also hope that the effectiveness of chemotherapy can be seen very soon after beginning treatment by using the right tumour seekers, or even stop therapy with little chance of success from being started at all.

Source: Delft University of Technology