



Radiotherapy and its physics

Treating prostate cancer

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Prostate cancer, there are two forms of radiotherapy. We can give either external beam radiotherapy where we shine the radiotherapy from outside into the body from different angles, where it cross-fires on the prostate that gets the treatment dose, and to do that we therefore have to treat normal tissue on the way in to get there and by coming in at different angles we can spare tissue to keep within a tolerance dose.

But the other way we can treat is by actually implanting radioactive seeds into the prostate and treat from the inside out. Thereby we can give a much bigger dose to the tumour with a high chance of success and reduce the chance of side effects to the surrounding tissues which receive far, far lower doses of radiotherapy.

And that can be done as a day case, as a day case procedure or an overnight stay. So rather than a patient for example, having a radical prostatectomy, where the prostate is removed with a big operation, where they're in hospital maybe for a week, er and then they have a catheter, err, urinary catheter inserted for two weeks, when that comes out after a radical prostatectomy the patient will have to get used to passing urine in a new way which may involve incontinence for a while, before they regain their continence, and then going back to work six weeks later.

With external beam radiotherapy we would split the treatment up into little fractions over a six or seven week course where the patient comes up and has a two minute treatment each day, Monday to Friday, not the weekend and it will be a ten minute appointment going into the room, getting on the couch, off the couch, for a total of six weeks so it's a regular commitment and if they're coming a long way then that can be inconvenient.

And the side effects of external beam radiotherapy are generally very little to begin with, so if the patients drive into the hospital, they can have their treatment and go home the same way. They may feel a little tired in the evening but very few symptoms around the prostate region itself.

However, after a week or two some of the side effects can add up with radiotherapy and they can develop local symptoms around the prostate region so for example they can pass urine a bit more frequently, symptoms like a urinary tract infection, in fact, so there may be a little bit of stinging passing urine, which can be eased drinking cranberry juice or fluids, its very manageable. And then the other thing that is close by is in fact, is the rectum, the back passage and as that needs to get some of the radiotherapy dose to treat the whole prostate they can get some bowel symptoms towards the end, err, but usually these days where we can treat the prostate in a far more conformal three dimensional shape, the side effects from other tissues are much less. So patients do not get as many bowel symptoms as they used to get. And then those symptoms may last a week or two after the radiotherapy and tail off.

Now the third treatment is Brachytherapy which is planting these radioactive seeds, err and for that procedure the patient comes in and has these seeds put in under an anaesthetic that may last an hour and a half, two hours, and then once they come round from the anaesthetic and the catheter comes out, once they've passed urine, they can go home.

And there after, for the first month really there are very few symptoms and in fact patients may be back on the golf course that weekend, or back at work if they so wished. But the symptoms with Brachytherapy tend to come a little bit later on and are very similar to the radiotherapy side effects but without the to-ing and fro-ing visits to the hospital.

It is now in the US the most popular form of treatment for prostate cancer and they perform over forty thousand Brachytherapy operations, or procedures per year.

Our increase is exponential here in the UK and I set up the Brachytherapy service here with our team about two and a half years ago when we were probably the third centre in the country to, to look at setting up prostate Brachytherapy.

There was the need for it. Our patients were having to travel hundreds of miles in some cases to get their treatment. And so now, together with the urologists, the physicists, the anaesthetists, the theatre team we have set up Brachytherapy service here, and currently we're treating fifty patients per year and it has become very popular and we are now treating patients from around our area and we are looking to expand up to about two hundred patients a year but we will need to have extra physicists and more theatre space and resources like that.