



Sound and light to the rescue

The use of focal therapy which treats the cancer alone and leaves the healthy tissue intact promises to make the side-effects of treatment for prostate cancer something of the past.

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Traditional treatment of early prostate cancer using surgery or radiotherapy to destroy the whole prostate can make one in every two men lose their erections and one in five become incontinent of urine.

The key challenges facing those of us who treat men with 'early' prostate cancer - in other words cancer that is confined to the prostate - is the avoidance of the side-effects of treatment.

Advances in radiotherapy have meant that men experience fewer side-effects than in the past but they can remain troublesome when they do occur. Robotic surgery has certainly improved recovery and minimised bleeding, but sadly, the expected improvements in preservation of continence and maintenance of erections have not materialised.

To date, active surveillance (watching the disease closely and treating those men who show signs of progressing) has been the only real treatment option available to those

men who do not wish to risk losing their erections or fear a future life that requires the use of absorbable pads because of urine leak.

Unfortunately about one-third of men on active surveillance will show signs of progression and will be then offered traditional treatment with the one in two chance of impotence and the one in five chance of urinary leakage.

These men, indeed probably all men, would favour a treatment that was a "one-off, delivered in an outpatient setting, possibly under local anaesthetic, could be repeated if necessary, and that would preserve sexual and urinary function in the broadest sense and, of course, treat the cancer. Such an apparently fanciful set of attributes is not the stuff of science fiction but is on offer to men today and moreover, the UK leads the field.

The way that all this can be achieved is to do what surgeons do in almost all other cancers.

Treat the cancer and preserve as much healthy tissue as possible. Interestingly, this approach was equally controversial when it was proposed for women with breast cancer and in patients with cancer of the kidney.

Breast conserving surgery, or the lumpectomy, as opposed to mastectomy is now the standard of care. 'Nephron preserving' as opposed to removal of the whole kidney is now also the standard of care in all but the biggest kidney tumours.

Treatments for prostate cancer result in side-effects because the surrounding structures are damaged. Structures like nerves and vessels and organs like the rectum and bladder can be either irradiated, cut, de-nervated (have their nerve supply disturbed) or displaced. As most men have three cancers in their prostate (one large and two small) that on average occupy five per cent of the prostate, we can limit treatment to the cancers only. In this way, we should be able to preserve about three quarters of the



prostate in most men and little to no damage to other structures.

A team of researchers at University College London Hospital (UCLH) led by Mark Emberton are putting all this to the test. We are conducting a number of clinical trials that look at different types of focal therapy.

Two of the studies use sound waves to target the cancer with a technology called High Intensity Focused Ultrasound or HIFU. This is done on a day case basis with patients leaving hospital an hour or two after treatment.

The early results look promising with no incontinence reported in the patients treated to date and potency preserved in nearly all (95 per cent). The team at UCLH are about to begin a completely new form of therapy using a derivative form of Chlorophyll combining this with laser light. This combination seems to generate very discrete lesions within the prostate that - in previous studies with a prototype agent - appeared to preserve the structure of the prostate. The team at UCLH are the first in the world to use this combination for men with prostate cancer. Of course many challenges lay ahead before we have the perfect treatment.

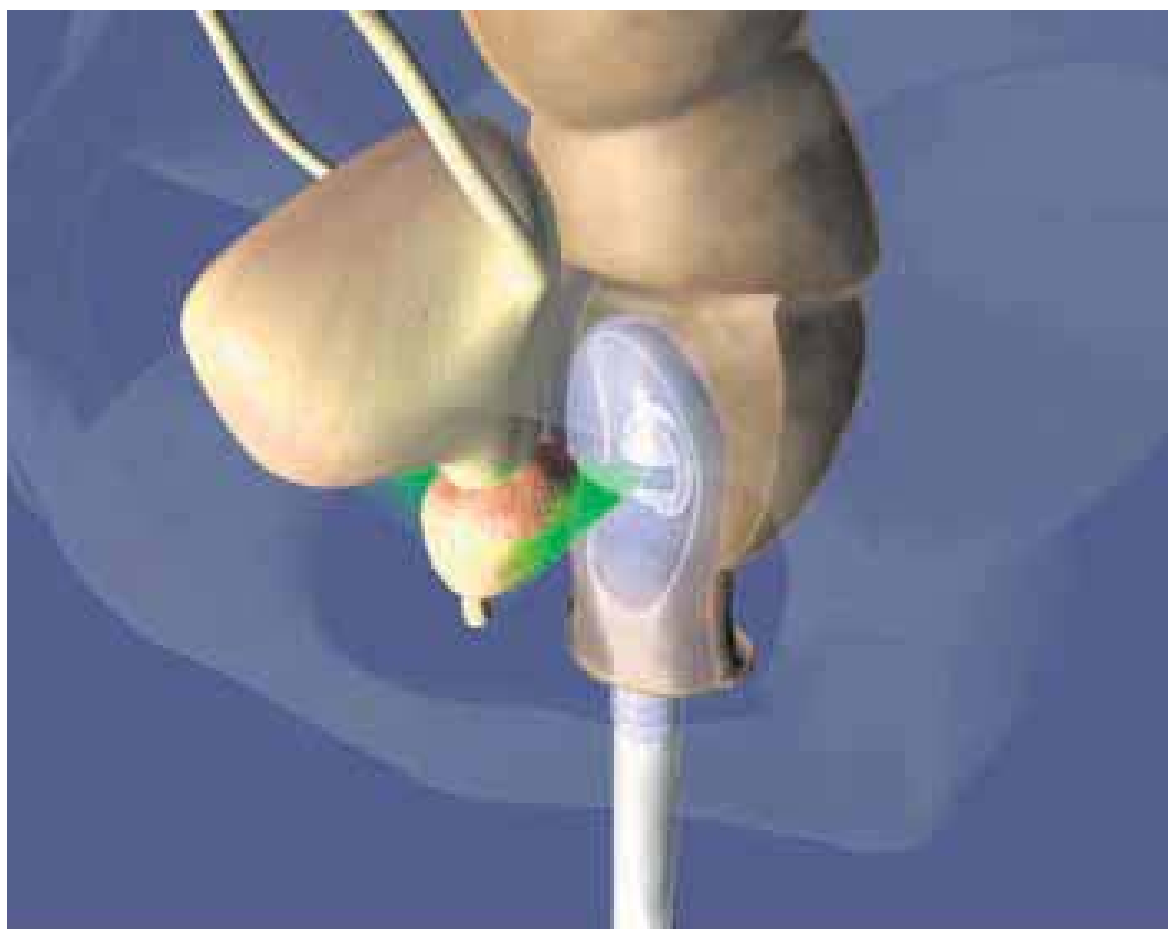
•Localising the cancer accurately remains difficult and often means that patients have to undergo an intensive form of biopsy known as prostate mapping.

•Controlling the energy sources so that we can reliably kill the cancer cells and at the same time preserve the normal surrounding tissue that is only a millimetre or two away

•Verification - making sure that the area targeted was in fact the area treated as well as making sure the long term cancer control is acceptable.

Fortunately most of these challenges are merely technological and there is very good evidence that the mighty resources of the biotech community are beginning to rise to the call.

As a result, we may have a treatment that may feel a little bit more like going to the dentist and possibly have to be endured no more than once or twice in a lifetime as opposed to the current major life event that is contemporary prostate cancer management.



High intensity focused ultrasound can be used to treat localised prostate cancer with minimal side-effects