**AQUABEAM® aquablation system for benign prostate hyperplasia**

**TECHNOLOGY**

The AQUABEAM® system is a heat-free tissue ablation treatment for benign prostate hyperplasia. The system has been developed by PROCEPT BioRobotics.

The AQUABEAM® system combines an ultrasound imaging system to map the prostate and a saline waterjet to ablate excess tissue. The surgeon uses a transrectal ultrasound probe to visualise the prostate and precisely map the area of the prostate to be resected. Secured by an attached articulating arm, a handpiece is inserted transurethrally into the bladder, which then delivers the robotically-controlled waterjet to precisely ablate the pre-selected tissue. The procedure is performed automatically by the robotic handpiece, but can be paused by the surgeon at any point. The average resection time is less than five minutes regardless of prostate size. Resected tissue can be collected for histology. The surgeon has the ability to visualise the resected cavity post-aquadlabation by using either cystoscopy or the ultrasound probe. The company state that, early study data suggests the system may reduce the risk of complications compared to other surgical procedures that resect prostate tissue.

AQUABEAM® received CE marking in December 2014 and the company anticipates availability for the NHS in 2017.

**POTENTIAL FOR IMPACT**

Enlargement of the prostate, a small gland that produces a fluid involved in the production of semen, can cause urinary problems in men particularly over the age of 50 years. It is not clear what causes this enlargement, known as benign prostate hyperplasia (BPH). The enlarged tissue can obstruct the bladder resulting in difficulty starting urination, fully emptying the bladder and a frequent need to urinate. The condition is not life-threatening but...
the symptoms can be troublesome and affect the man’s quality of life.

Medications such as 5α-reductase inhibitors finasteride and dutasteride can reduce the size of the prostate. Alpha blockers can be used to relax the bladder muscles and increase urinary flow. In patients with more severe BPH, surgery to remove the enlarged prostate may be considered. The main surgical treatment for BPH is currently transurethral resection of the prostate (TURPS), which involves inserting a small instrument called a resectoscope into the urethra, and using a wire loop heated by an electric current to remove excess tissue from the prostate. Recent developments have seen the use of lasers to provide the heat for resecting the tissue. Complications of prostate surgery include urinary incontinence, which is usually temporary and erectile dysfunction, which may be experienced by up to 10% patients and retrograde ejaculation, reported in up to 65% of patients.

The company state that careful mapping of the area to be resected using ultrasound means the AQUABEAM® system can avoid key anatomical landmarks that, if damaged, could lead to complications, and as the system does not use heat, patient recovery is likely to be accelerated.

This technology is predicted to have an impact on the following domain of the NHS Outcomes Framework (https://www.gov.uk/government/publications/nhs-outcomes-framework-2016-to-2017):

Domain 3 Helping people to recover from episodes of ill health or following injury.

EVIDENCE

PUBLISHED PAPERS AND ABSTRACTS


Lay summary

The AQUABEAM® system has been developed to treat enlarged prostate glands in men. The prostate is a small gland involved in the production of semen which can enlarge and cause men aged over 50 to have problems urinating. Medicines used to shrink the prostate do not always work, and surgery is then used to cut up and remove the prostate. Prostate surgery leaves patients with a small risk of urinary incontinence or problems with getting an erection. With the AQUABEAM® system, the surgeon uses ultrasound to get a better image of the tissue that needs removing and a waterjet to cut out the tissue. The developer says the system may have fewer complications and may allow the patient to leave hospital sooner than with current treatments.