Policy Position – Transperineal Biopsy of the Prostate

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What is it?

There are different types of prostate biopsy (sampling of cells from various regions of the prostate), depending on equipment, MRI results, PSA results and other factors. One key difference between biopsy types is the route of access to the prostate: through the rectal wall using a transrectal ultrasound-guided (TRUS) biopsy performed with local anaesthetic (LA), or a transperineal (TP) biopsy, which goes through the skin of the perineum and is performed under general anaesthetic (GA). New technology has enabled TP biopsy to be performed in the outpatient clinic under local anaesthetic (LATP).

What do we think?

The purpose of a prostate biopsy is to test cells for cancer and to determine the stage of any cancer present. Currently, the level of published, peer-reviewed evidence is not sufficient to demonstrate that TP is better at diagnosing cancer than TRUS. However, it is also not shown that TP is worse than TRUS at diagnosing cancer. This equivocal evidence base means **we currently cannot call for TP to exclusively replace TRUS biopsy** on grounds of improved rates of prostate cancer diagnosis.

There are other considerations in the choice of biopsy technique. Evidence shows that a TRUS biopsy can result in side effects, the most serious of which is sepsis. TP biopsies cause side-effects too, but have much lower rates of sepsis compared to TRUS. This is an unequivocal benefit of the TP technique. Other side effects of prostate biopsy include urinary retention and erectile issues. There is some evidence TP biopsy causes more of these effects, but they are deemed less serious and usually resolve within a few months. Men should always be counselled about possible side effects before any prostate biopsy procedure.

Procedures of this nature will always involve some discomfort. Patient reports of their experience suggest there is little difference between TRUS and TP in this regard.

Based on this reduced risk of harm through sepsis, we want both types of biopsy to be available to men and for them to make an informed choice about which one is right for them, when this is clinically appropriate.

Why do we think this?

The studies that have been published on TP biopsy are quite difficult to compare directly, as they often do not compare like-for-like techniques (biopsy guidance, number of cores, anaesthesia, etc).

Many were also published before multiparametric MRI (mpMRI) was routinely conducted prior to biopsy, meaning the biopsy was not targeting identified lesions. It has subsequently been demonstrated that targeted biopsies are more accurate than random sampling.[1] The one study that did directly compare MRI-targeted TRUS and TP biopsy had only a small cohort, and used a broad definition of clinically significant cancer to confirm cancer diagnosis. However, its results showed better cancer diagnosis by TP biopsy, especially in the anterior region of the prostate.[2] Targeting of biopsy samples based on MRI results can be done through fusion software or through a "cognitive" method, though evidence suggests there are no significant differences in outcome.[3] The current implementation of mpMRI before biopsy across the NHS should make biopsy targeting more widespread. Random biopsy sampling should only be used when the mpMRI scan is equivocal, or is negative but other risk factors still recommend a biopsy. Where guidance was only through ultrasound, TP and transrectal (TR) biopsy showed no difference in cancer detection.[4] As a result of this, Prostate Cancer UK does not feel in a position to unequivocally recommend TP over TRUS biopsy.

Traditionally, TP biopsy under GA was associated with a mapping protocol, taking many core samples (often in the order of 50+). LATP takes fewer cores, either in a systematic or targeted fashion.[5] There is not yet any conclusion on the optimum number of cores for reliable cancer detection in a reasonable time and burden on the patient, with protocols varying from as few as 6 to 30+.

The evidence on sepsis rates is much more definitive. A trial in London with 634 men undergoing template-mapping TP biopsy resulted in zero cases of sepsis.[6] Similarly, a cohort of 245 men in Australia saw zero hospital re-admissions after TP biopsy.[7] A meta-analysis totalling 6609 patients found only five hospitalisations for sepsis.[8] Estimations of infection arising from TRUS biopsy vary in the literature, but analysis of Hospital Episode Statistics showed a 1.1% hospital admittance rate for infection/sepsis within 30 days of TRUS biopsy in 2000-2008 (a cohort of nearly 200,000 patients). Over this period the risk of sepsis was shown to have increased by 70% - likely due to increasing levels of antibiotic resistance, especially to the quinolone family of antibiotics.[9] A further advantage of TP biopsy is that, due to the cleaner site of needle entry, a course of antibiotic prophylaxis is not required before the procedure. Evidence shows a single dose of cephazolin is sufficient antibiotic coverage, and even this may not be necessary.[10]

TP biopsy is shown to more frequently cause acute urinary retention, but this is self-limiting over a few days.[11] Less commonly, it can cause chronic urinary retention that may require readmission. Evidence around side effects on sexual function is quite limited.[12]

Resource considerations

Current NHS tariffs deem TP biopsy to be much more expensive than TR (£1093 vs £329)[13] due to the additional costs of TP performed under GA in an operating theatre rather than outpatient clinic. The introduction of new equipment makes it possible for TP to be provided under LA, making it possible to perform this technique in an outpatient setting, removing the costs associated with a GA. This also has the advantage of decreasing the time to diagnosis, as there is no need to wait for a theatre session to be available. This makes meeting the 28-day diagnosis target more achievable. However, GA should still be available and will be preferable to the man or clinically necessary in some cases.

Significant cost burdens are also placed on the NHS by the cases of sepsis arising from prostate biopsy. A 2012 study estimated the annual cost in England and Wales of infection arising after TRUS biopsy to be approximately £7.7-11.1 million. The estimated cost of each individual patient admitted for post-TR biopsy infection was £4260.[14] A reduction in cases of sepsis brought about by expanding the use of TP biopsy would reduce these associated costs.

Introduction of LATP biopsy would require capital costs, but affordable "freehand" systems to perform the procedure have been developed, such as PrecisionPoint and CAMPROBE.[15,16] Clinic space is also needed as is a specialist chair with stirrups. Other more complex systems use stepper motor-mounted probes, and potentially MRI fusion software, that add to the initial set-up cost.

What should happen next?

Further evidence from randomised controlled trials is needed to determine the difference in efficacy between TP and TR biopsy. Similarly, more comprehensive data is required on the outcomes of LATP biopsy such as the incidence of side effects. A number of systems and protocols are currently in use, and future trials are needed to determine the appropriate number of cores to sample for optimal cancer diagnosis, and the best method of targeting.

For the LATP procedure to be adopted across the NHS, a more appropriate tariff cost must be set that accurately reflects the cost of the procedure. Training for urologists, radiologists and clinical nurse specialists is also needed, and Prostate Cancer UK is funding training to facilitate this.

Centres across the UK that have already started to use LATP biopsy should aggregate their data to show outcomes in a large-scale UK population.

Summary

- We can't say if TP biopsy is better at detecting cancer than TR, as no sufficiently detailed comparison has been done between them.
- We do know that TP biopsy results in fewer cases of infection and sepsis than TRUS, therefore causing less harm to men and lower costs on the NHS for dealing with these side effects.
- A move to TP biopsy would benefit efforts to use antibiotics less frequently, as is does not require a course of quinolone antibiotic prophylaxis.
- New techniques allow TP biopsy to be performed under local anaesthetic, meaning it can be done in an outpatient clinic rather than an operating theatre – this is faster and cheaper than using general anaesthetic.
- We want the choice of this technique to be available to men where clinically appropriate. To this end, we are supporting Guy's Hospital in running a training course for nurses to learn to perform it.
- Biopsies (transperineal and transrectal) should be targeted based on the results of a multiparametric MRI scan, as evidence shows this makes them more accurate than a random sampling pattern.

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