

DEFINITION

Image-guided ablation of well-defined and biopsied prostate tumor lesion(s), with safety margin (at least 10 mm).

GOAL

Improve functional outcomes without sacrificing the oncologic control afforded by whole gland treatments.

Although the majority of prostate cancers (PCa) are multifocal (13-38% unifocal), the index lesion determines the evolution and prognosis of patients.

ACCURATE DIAGNOSIS AND RIGOROUS PATIENT SELECTION IS THE KEY TO SUCCESS

Identify the index lesion: the highest grade tumor. No consensus if Gleason Grade 1 can be defined as an index lesion. Transrectal Ultrasound (TRUS) guided prostate biopsy is not the ideal; **mpMRI, transperineal biopsy and fusion systems** improve the identification of candidates for Focal Therapy (FT) and the planning of the ablation.

EAU GUIDELINES CONSIDER FT AN EXPERIMENTAL THERAPY

Offer FT within a clinical trial or well-designed prospective studies

Important a good patient selection: Men with a life-expectancy >10 years with low- intermediate-risk PCa, PSA<10, and one lesion <1.5 cc or lesions <3 cc confined to a single lobe.

ABLATION ENERGY SOURCES

None of modalities has shown superior oncologic outcomes (Failure-free survival 82-95% at 3 years)

Similar urinary continence rates (95-100%) and erectile function rates (70-90%)

Limitations: Heterogeneity of the studies, no long-term outcomes, no comparative, no control arm.

Distinguishing FT from partial gland ablation (quadrant, hemiablation, hockey-stick ablation and subtotal ablation)

	Ablation energy	Mechanism of cell death	Approach
CRYOTHERAPY	Freezing/mechanical	Apoptosis	Transperineal (TRUS, CT, MRI)
HIFU	Heat/mechanical	Coagulative necrosis	Transrectal (TRUS)
IRREVERSIBLE ELECTROPORATION	Electrical/mechanical	Wall pores---cell death	Transperineal (MRI, TRUS)
FOCAL LASER ABLATION	Heat	Coagulative necrosis	Transperineal (MRI-thermometry)
PHOTODYNAMIC THERAPY	Vascular targeting	Reactive oxygen species--apoptosis	Transperineal (TRUS)

FOCAL CRYOTHERAPY

- ✓ Real time TRUS monitoring of ablation zone
- ✗ No for small glands
- ✗ Limited precision: damage in adjacent structures

IRREVERSIBLE ELECTROPORATION (NANOKNIFE®)

- ✓ No thermal damage in adjacent structures. Preserve connective tissue
- ✗ Pending long-term results

HIFU (HIGH INTENSITY FOCUSED ULTRASOUND)

- ✓ Less invasive
- ✓ Precise ablation
- ✗ No for anterior tumors or large glands (depth 4cm)

FOCAL LASER ABLATION

- ✓ Office-based procedure (local anesthesia)
- ✗ Require precise overlapping of treatment zones
- ✗ Limited data

PHOTODYNAMIC THERAPY

- ✗ Oxygen and photosensitizer dependent

Follow-up proposal: PSA every 3 months the first year and then every 6 months + mpMRI at 6 months, 1 year and then yearly + biopsy-target of the index lesion and the rest of the gland one year after treatment (thereafter only if clinical, radiological or biochemical changes).

Treatment failure: Positive biopsy after FT (in the treated area). MRI enhancement suggests treatment failure.

Management of treatment failure: Repeat FT or radical salvage treatment.