[0010] 2. Description of the Background Art. U.S. Patent Nos. 8,088,072; 8,206,300 and 8,262,574 have been described above and are incorporated herein by reference. U.S. Patent No. 7,918,795, commonly assigned with the present application, describes probes useful for both imaging and treating uterine fibroids, which probes could be used in the systems and methods of the present application and is incorporated herein by reference. Other commonly assign ned patents and published applications describing probes useful for treating uterine fibroids in the systems include U.S. Patent Nos. 7,874,986 and 7,815,571; and U.S. Patent Publications 2007/0179380 and 2008/0033493. See also U.S. Patent No. 6,050,992 and U.S. patent Publication 2007/0006215.

BRIEF SUMMARY OF THE INVENTION

[0011] The present invention provides methods and systems for deploying needle structures in tissue. The needle structures may in some cases comprise a single needle but in most cases will comprise multiple needles or needle and tine assemblies as described in more detail below. The needle structures are usually intended to deliver a therapy to the tissue, most typically being configured to deliver radiofrequency energy, plasma energy, therapeutic ultrasound energy, microwave energy, heat, cold (cryogenic treatment), or other energy to ablate or otherwise modify a target tissue or targeted anatomy within the tissue. Alternatively, the needle structures could also provide drug or other substance delivery, morcellation, or other tissue treatments which can be effected using a needle structure.

[0012] In one aspect there is provided an imaging and therapeutic delivery system comprising:

an imaging component comprising an imaging shaft having a proximal end and a distal end and an imaging transducer at the distal end of the shaft;

a needle component comprising a needle shaft having a distal end and a proximal end and a needle structure reciprocally disposed on or within the shaft;

wherein the needle shaft is configured to removeably attach to the imaging shaft with the shafts lying side-by-side with their respective axes generally parallel.

[0012a] In one apect there is provided a system for treating an anatomical feature in tissue, said system comprising:

a real-time display connected to a controller;

means for projecting and adjusting at least one of a treatment boundary and a safety boundary on the display;

a treatment probe having a deployable needle structure and an imaging transducer connectable to the controller and display; and

at least one servo drive motor on the treatment probe connected to the controller, wherein the controller is configured to drive the servo motor to position the needle structure to provide a treatment which covers the treatment boundary and which does not extend beyond the safety boundary.

[0012b] In one aspect there is provided a system for treating an anatomical feature in tissue, said system comprising:

a real time image display;

a treatment probe having a deployable needle structure and an imaging transducer, wherein the transducer is connectable to the real time image display;

a positionable stop structure on the treatment probe, wherein a position of the stop structure on the probe (1) controls at least one of a position and a size of a treatment or safety region projected on the real time image display and (2) physically limits deployment of the needle structure so that subsequent treatment of the tissue is within the projected treatment and/or safety region.

[0012c] The methods and systems of the present invention are particularly suitable for treating fibroids in a patient's uterus where a probe carrying the needle structure and an imaging transducer, typically an ultrasonic imaging transducer, is introduced transvaginally and transcervically into the uterus, or in other cases laparoscopically into and through an exterior of the uterus or other organ or tissue target. The probe is manipulated within the uterus to deliver ablative energy to the fibroid as described in more detail below. In most embodiments of the present invention, the needle structure is "virtually" deployed on a real-time image of the tissue prior to actual deployment of the

needle in the actual tissue. Treatment and/or safety boundaries within the tissue will also be determined and optionally adjusted prior to the actual deployment of the needle structure. In other embodiments, the actual position of the needle structure may be tracked and the corresponding treatment and/or safety boundaries projected on the screen in real time. In all embodiments, the treatment and safety boundaries can be checked before treatment is commenced.