

CLAIMS

1. An electrosurgical apparatus for treating a biological growth that contains a fluid-filled sac, the apparatus comprising:

an electrosurgical instrument for delivering microwave energy into biological tissue, the electrosurgical instrument comprising:

a coaxial cable for conveying microwave energy; and
a radiating tip portion disposed at a distal end of the coaxial cable to receive microwave energy from the coaxial cable; and

a fluid delivery mechanism for transporting fluid to and from a treatment zone located around the radiating tip portion,

wherein the fluid delivery mechanism comprises:

a flexible fluid conveying conduit that extends along the coaxial cable, and

a rigid insertion element in fluid communication with a distal end of the fluid conveying conduit and arranged to extend into the treatment zone,

wherein the fluid delivery mechanism is arranged:

to aspirate fluid from the treatment zone, and

to inject a substance into the treatment zone to replace the aspirated fluid, and

wherein the substance has dielectric properties selected to facilitate uniform delivery of treatment energy to biological tissue in the treatment zone.

2. An electrosurgical apparatus according to claim 1, wherein the treatment zone includes a fluid-filled sac contained within a biological growth, whereby the fluid delivery mechanism is arranged to replace biological fluid in the fluid-filled sac with the substance.

3. An electrosurgical apparatus according to claim 1 or 2, wherein the fluid delivery mechanism is arranged to inject a volume of the substance into the treatment zone that is equal to a volume of the fluid aspirated from the treatment zone.

4. An electrosurgical apparatus according to any preceding claim, wherein the substance consists of a dielectric fluid.

5 5. An electrosurgical apparatus according to any preceding claim, wherein the substance comprises de-ionised water or saline.

10 6. An electrosurgical apparatus according to any preceding claim, wherein the substance extends the radiating tip portion.

15 7. An electrosurgical apparatus according to any preceding claim, wherein the substance is selected to transition from a liquid phase to a solid phase during application of microwave energy to the treatment zone.

20 8. An electrosurgical apparatus according to any preceding claim, wherein the rigid insertion element comprises a hollow needle.

25 9. An electrosurgical apparatus according to any preceding claim, wherein the coaxial cable comprises an inner conductor, an outer conductor, and a first dielectric material separating the inner conductor and outer conductor, and wherein the inner conductor is hollow to provide a passageway for the fluid delivery mechanism.

30 10. An electrosurgical apparatus according to claim 9, wherein the rigid insertion element is in fluid communication with the flexible fluid conveying conduit via the passageway.

35 11. An electrosurgical apparatus according to claim 9 or 10, wherein the rigid insertion element is slidably mounted in the passageway.

40 12. An electrosurgical apparatus according to any preceding claim, wherein the rigid insertion element is movable between an exposed position where it protrudes beyond the distal end of the electrosurgical instrument, and a

retracted position in which it is set back from the distal end of the electrosurgical instrument.

5 13. An electrosurgical apparatus according to any preceding claim, wherein the electrosurgical instrument comprises an ultrasound probe for producing images of a patient's internal organs.

10 14. An electrosurgical apparatus according to any preceding claim further comprising:
 a generator for generating the microwave energy; and
 a surgical scoping device for non-percutaneous insertion into a patient's digestive tract, the surgical scoping device having an instrument channel running along its length,
15 wherein the electrosurgical instrument and fluid delivery mechanism are conveyed within the instrument channel of the surgical scoping device, and
 wherein the coaxial cable is connected to receive the microwave energy from the generator.

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