Our Technology, Your Health.

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SPINE

Bipolar Radio Frequency Plasma Surgical Electrodes

Radio Frequency Plasma Surgical Systems

CFDA CE 0197 TÜVRheinland

BONSS® MEDICAL

www.BONSS.com.cn
BS-P File V2018.03.05

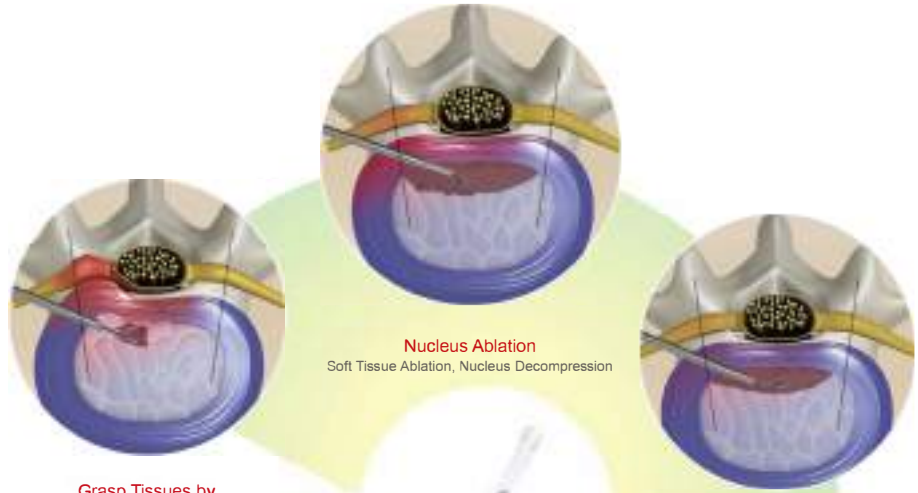
Global Brand
BONSS Plasma Tech

Specialized in Minimally-invasive Radio Frequency Plasma Technology for Spine Surgery

Spine-o-Flex *RF Ablation Electrode*

Bipolar RF Ablation Electrode provides an innovative and effective surgical procedure with excellent clinical outcome.
Designed for contained disc herniations disectomies.
A surgical procedure of safe, rapid and effective performances.
An innovative and minimally-invasive surgical solution for discogenic diseases.

Minimally-invasive
Shorter Procedure Time
Reduced Tissue Damage
Less Patient Pain
Faster Recovery
Intradiscal Decompression

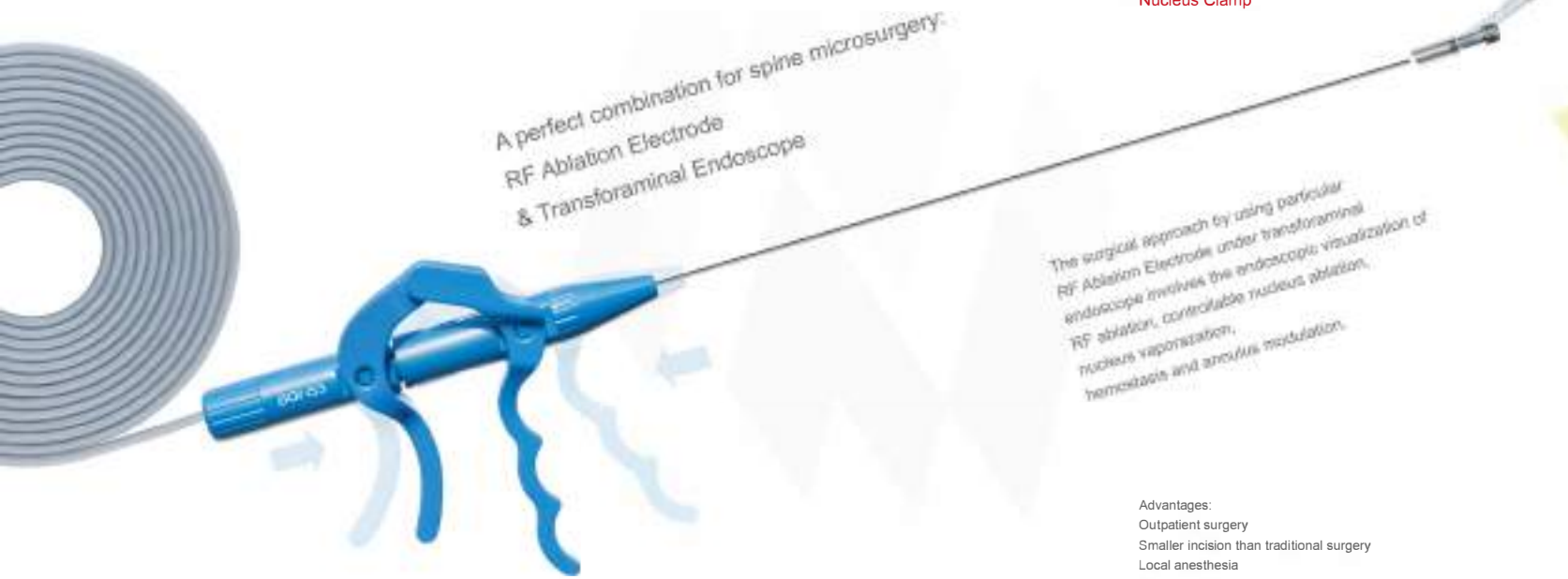


Grasp Tissues by
Nucleus Clamp

Nucleus Ablation
Soft Tissue Ablation, Nucleus Decompression

Annulus Modulation
Soft Tissue Shrinkage and Coagulation
Annulus Shrinkage

Decompression Finished



A perfect combination for spine microsurgery:
RF Ablation Electrode
& Transforaminal Endoscope

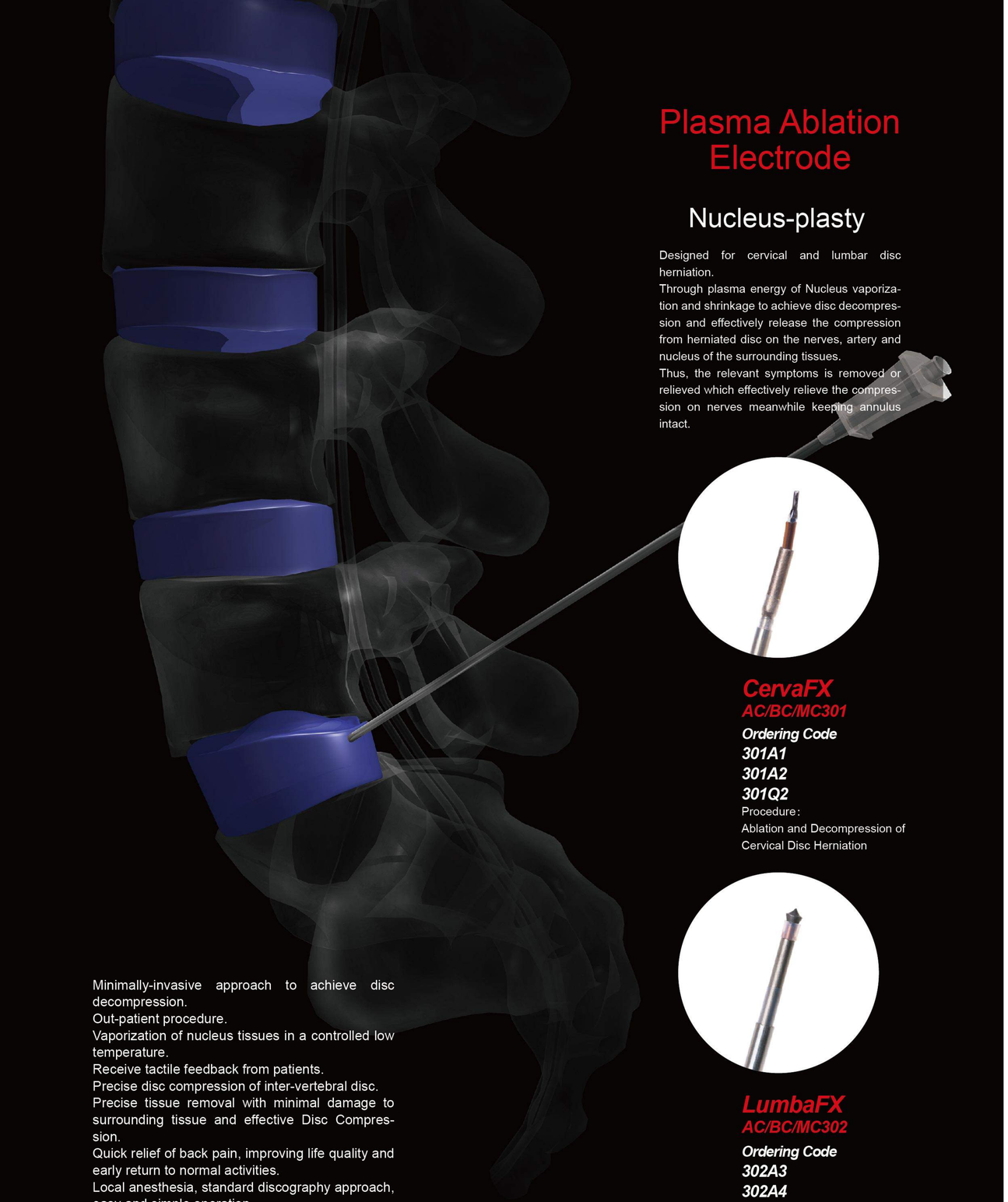
The surgical approach by using particular RF Ablation Electrode under transforaminal endoscope involves the endoscopic visualization of RF ablation, controllable nucleus ablation, nucleus vaporization, hemostasis and annulus modulation.

Advantages:
Outpatient surgery
Smaller incision than traditional surgery
Local anesthesia
Precise access to target tissues

AC/BC/MC302

Ordering Code

302Q5\302E5



Plasma Ablation Electrode

Nucleus-plasty

Designed for cervical and lumbar disc herniation.
Through plasma energy of Nucleus vaporization and shrinkage to achieve disc decompression and effectively release the compression from herniated disc on the nerves, artery and nucleus of the surrounding tissues.
Thus, the relevant symptoms is removed or relieved which effectively relieve the compression on nerves meanwhile keeping annulus intact.

CervaFX
AC/BC/MC301
Ordering Code
301A1
301A2
301Q2
Procedure:
Ablation and Decompression of Cervical Disc Herniation

LumbaFX
AC/BC/MC302
Ordering Code
302A3
302A4
302Q4
Procedure:
Ablation and Decompression of Lumbar Disc Herniation

Minimally-invasive approach to achieve disc decompression.
Out-patient procedure.
Vaporization of nucleus tissues in a controlled low temperature.
Receive tactile feedback from patients.
Precise disc compression of inter-vertebral disc.
Precise tissue removal with minimal damage to surrounding tissue and effective Disc Compression.
Quick relief of back pain, improving life quality and early return to normal activities.
Local anesthesia, standard discography approach, easy and simple operation.
Minimally-invasive and safe procedure, with low risk and little complications.
Excellent surgical outcomes.

Treatment for Cervical Spondylosis (Neck and Shoulder Pain) by Plasma Ablation Nucleus-plasty

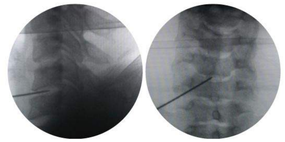
Position

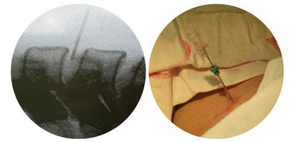
Adopt supine position, make the patient's neck extended slightly, position the target disease spaces by Kirschner wire under Fluoroscopy, and mark the position.

Local Anesthesia

Puncture

Under C-arm CT guidance, insert the needle between the arterial sheath and the viscera sheath into the center point of Inter-vertebral disc. Make sure the needle is inserted into the center point in both front and side position under fluoroscopy.





After trocar positioned, pull out the stylet

Placement of the Electrode

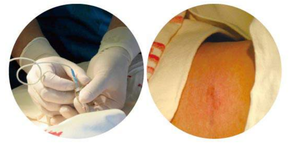
Gently push the electrode in the trocar needle direction, coupling it with(rotating fixation) the needle end, and confirm the electrode position under fluoroscope.

Ablation

Set the generator output to gear 2 (125 VRMS) , step on COAG pedal for half a second to test the reaction of the patients and make sure there's no exception reaction; If any stimulus symptoms happens, the surgeon should readjust the puncture position;

Step on ABLATE pedal, at the same time, repeatedly rotate electrode tip by 180 degrees for 10 ~ 15 seconds to complete an ablation process. If a second ablation at the same interval is needed, firstly remove the coupling of electrode and puncture needle end and retreat the electrode by 1 cm to make the electrode tip back into the needle, retreat the needle back by 2 ~ 3 mm, and then re-coupling electrode at the puncture needle end. To make another ablation process by using the same way as above.

After ablation, remove coupling, withdraw the electrode, and pull out the needle.
Coated the skin with band-aid after pulling out the needle. Neck collar fixed for a week.



Patient Selection (Indications)

Patients with heavy shoulder & neck, pain with upper limbs root acid bilges, burning pain symptoms and confirmed by MRI to be corresponding herniated interval disc space with cervical spondylosis.
Patients with headache, dizziness, tinnitus, vertigo and has been diagnosed without internal related diseases.
Patient diagnosed to be cervical spondylosis without operative indications.

Attention

For patients diagnosed under MRI to be multiple segmental cervical Inter-vertebral disc herniation, doctors should carefully sort out the major interval space corresponding to symptoms and objects to avoid too much segment operation at a time.
For patients who mainly have arm numbness and urge to relieve numbness symptoms, doctors should select carefully.

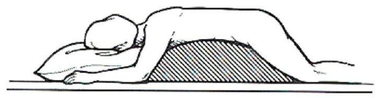
Nucleus-plasty by Low-temperature Plasma Ablation Percutaneous Puncture Treatment for Herniated Disc

Equipment

C-arm CT
Plasma Surgical System
Plasma Electrode
Puncture Needle/Trocar Needle

Key Points in Lumber Surgical Operations

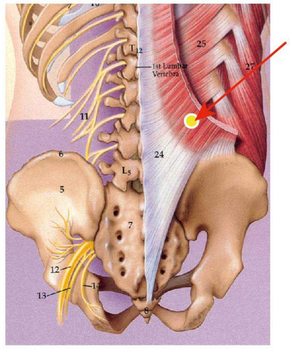
Position Prone Position



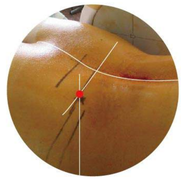
Location

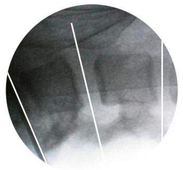
Using Kirschner wire to locate lesion interval under fluoroscope in prone position, and mark it on body surface.

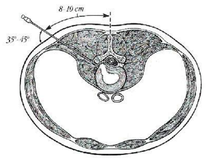
Choosing Puncture Point



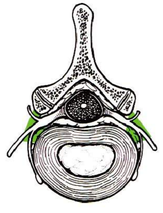
The point at 8-10CM away from the spine mid-line and parallel with Inter-vertebral space.

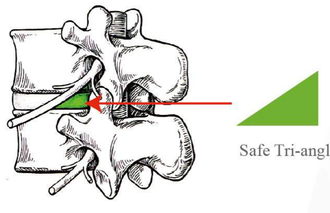


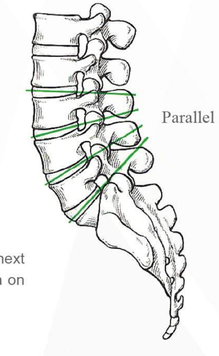




Under guidance of CT, to insert the special puncture needle into inter-vertebral disc through the point of 8-10CM away from the spine-midline and parallel with inter-vertebral space, where it's called safe tri-angle area. Keep the needle at a 35-45 degree angle with skin.





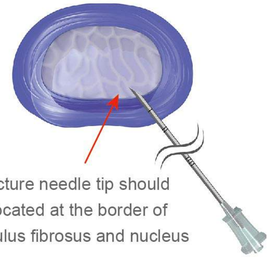


Lumber nerve root stick out from the Inter-vertebral foramen, forming a "safe tri-angle area" with superior margin of next vertebral and its anterolateral surface of joint facet. Annulus fibrosus of Inter-vertebral disc is located in this area on which there is no bone structure.

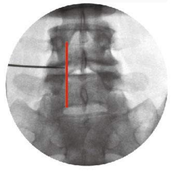
Local Anesthesia

Puncture Location

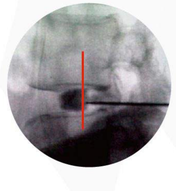
a) Key Point of Puncture:



Puncture needle tip should be located at the border of annulus fibrosus and nucleus



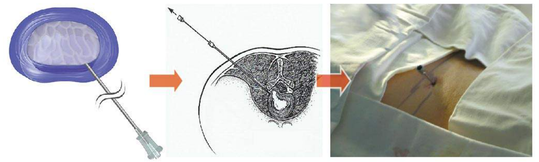
Entopic needle is positioned at medialis edge of vertebral pedicle



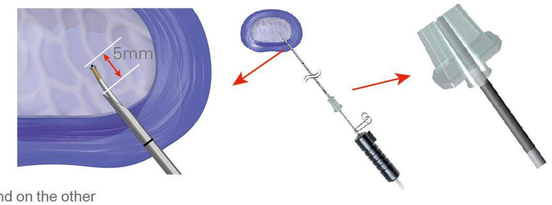
Lateral Needle is positioned at retral 1/3-1/4 of vertebral pedicle

b) Key Points of Plasma Surgical Electrode Puncture:

1) Draw out the needle core, and then insert in the lumber plasma electrode

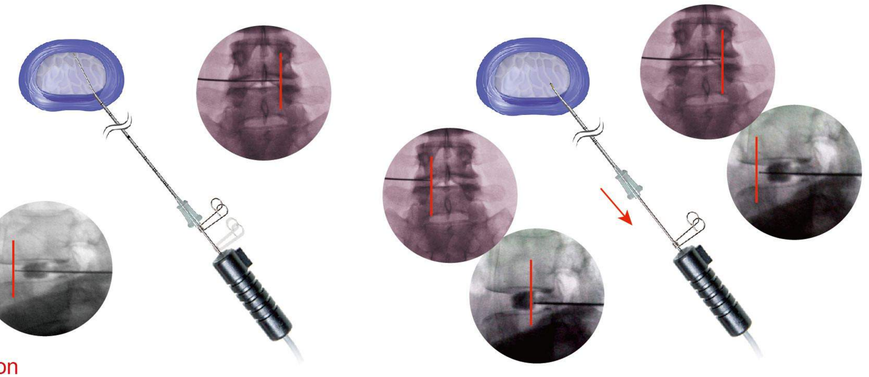


2) When the mark on the back of electrode sheath meets the end of the puncture needle, the electrode tip should stick out the puncture needle by 5mm. It's the proximal position of the ablation procedure. The electrode tip sticking out the puncture needle is longer by 5mm than the puncture needle to ensure that the electrode working part has no contact with puncture needle in the nucleus.



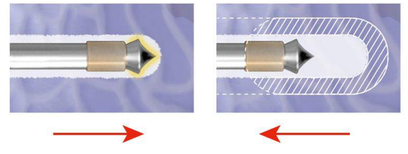
3) Push the electrode until it stops, to make it reach the end on the other side of the annulus fibrosu and to confirm the position under fluoroscope, and move the spring clamp to the end of the puncture needle. This point is the distal ablation point.

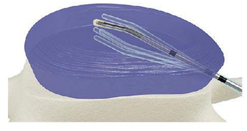
4) Retreat the electrode to the proximal point, and start the ablation operation.



Ablation

Under monitor of C-arm CT, set the generator to Gear 2 (125Vrms), step on the ABLATE pedal of the foot switch, push the electrode slowly to the distal point for decompression operation, and then step on the Coagulation pedal, meanwhile retreat the electrode by the same route at the speed of 5mm/Sec, thus the ablation and coagulation in one direction is finished.





Operate ablation procedure in another 5 directions:

2 o'clock, 4 o'clock, 6 o'clock, 8 o'clock and 10 o'clock.

Attention

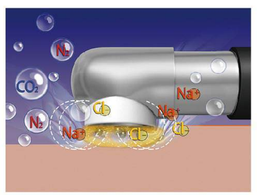
Keep the puncture needle parallel with inter-vertebral space.
Patients may feel lumber pain when puncture needle reaches the annulus fibrosus.
If any radiating pain happens at lower extremities, stop the puncture immediately, change the puncture position and re-puncture.
Repeated and multi-times puncture at L5-S1 is not recommended.
Waist soreness or mild pain is normal reaction during surgery.

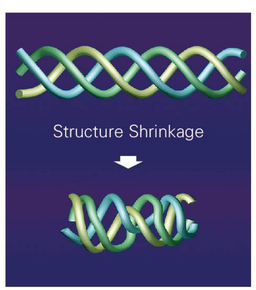
Patient Selection(Indications)

Patients under age of 50, with course of disease less than 5 years.
No effect or little effect from conservative treatment, and not open to open surgery.
Patients suffering from lumbago from long-time sitting or standing with radiating pain of hip or low extremities, with main symptoms of nerve root stimulation related to Inter-vertebral disc pressure.
Height of Inter-vertebral disc > 75%.
MRI: diagnosis to be IDD DDD contained herniated disc.
Discography Positive.

EBLATOR ARS600 Radio Frequency Plasma Surgical System

How It works





The Surgical System adopts unique technology of controlling radio frequency emitting, whose power output can exactly produce plasma energy. Optimized power output can produce plasma energy effectively and speedily while minimize the thermal energy in the joints.

ABLATE

The Radio Frequency energy flows through active electrode and return electrode, and by the conductive saline solution it generates precisely focused plasma sheath around the electrodes. The plasma sheath consists of massive charged particles which can generate sufficient energy of strong oxidizing when accelerated by the electric field. The generated energy is powerful enough to break the organic molecular bonds within the tissue, and make the tissue rapidly dissolved into molecular and atoms level at a relatively low temperature of 40-70˚C. The device provides rapid and efficient ablation and resection capabilities of soft tissues in a relatively low temperature.

COAGULATE

When RF energy acts on tissue (including blood), around the electrode tip it generates Joule heat and electromagnetic wave effect which providing an immediate coagulation of tissue protein and sealing of small blood vessels, thus coagulation and hemostasis capabilities of target tissues are realized.

The surgical process by plasma ablation creates well-distributed coagulative necrosis for efficient hemostasis while preserving the mucosa and fibrous tissue. Compared to that of conventional surgical methods, its post-operative recovery is improved.

Different from the past thermal coagulation by high temperature, plasma technology can make the working temperature controlled at 40-70˚C, and coagulate helical structure of collagen molecules meanwhile preserving the cells vitality.

Excellent Performance

Systematic Working Mode

Two working modes:
ABLATE for resection and ablation activated at Yellow control panel and Yellow foot pedal.
COAG for coagulation and hemostasis activated at Blue control panel and Blue foot pedal.

Enhanced Coagulation

Enhanced coagulation mode can improve hemostasis capability while providing clear surgical vision.

Intelligent Control System

Designed with automatic identification of electrode, foot switch and power cord, displayed respectively on the device control panel, and automatic default power output value for different electrode designs.

Automatic Protection

The electrical circuit system in ARS 800 controller can constantly monitor power output and automatically suspend power output when there is instantaneous peak current. For example, the controller will automatically suspend radio frequency output when electrode contacts or is close to metal, and automatically resumes work after electrode has returned to a proper distance.

Bipolar and Multi-polar Technology

Various bipolar and multipolar electrode designs are available.
Around the electrode tip, sufficient and stable plasma layer is generated for rapid resection, ablation, coagulation and hemostasis of soft tissues.

Foot Switch

The water-proof, pressure-resistant and convenient foot control has two working modes of ABLATE and COAG, each identified in different colors and working sounds.

Integrated Function

In one versatile single-use electrode, it provides ABLATE for resection and ablation, and COAG for coagulation and hemostasis.

Temperature Control Technology

The surgical process by plasma technology is performed at controlled 40-70˚C. It uses a controlled, non-heat driven process in which bipolar radiofrequency (RF) energy excites the electrolytes in a conductive medium, usually saline solution, to create a precisely focused and charged plasma gas. The energized particles in the plasma have sufficient energy to break the organic molecular bonds within tissue, causing tissue to dissolve at relatively low temperatures of 40-70˚C. Radiofrequency current does not pass directly through tissues, causing minimal tissue thermal effect. By temperature control technology, it automatically optimizes output value according to the plasma layer status around the electrode tip and the target tissue feature, by which electrode can provide a stable and efficient capabilities while keeping the lowest working temperature.

Timer

When the special electrode with time control is selected, the generator automatically recognize the electrode and start to count the active time by 100ms.