

Our Technology, Your Health.

JIANGSU BONSS

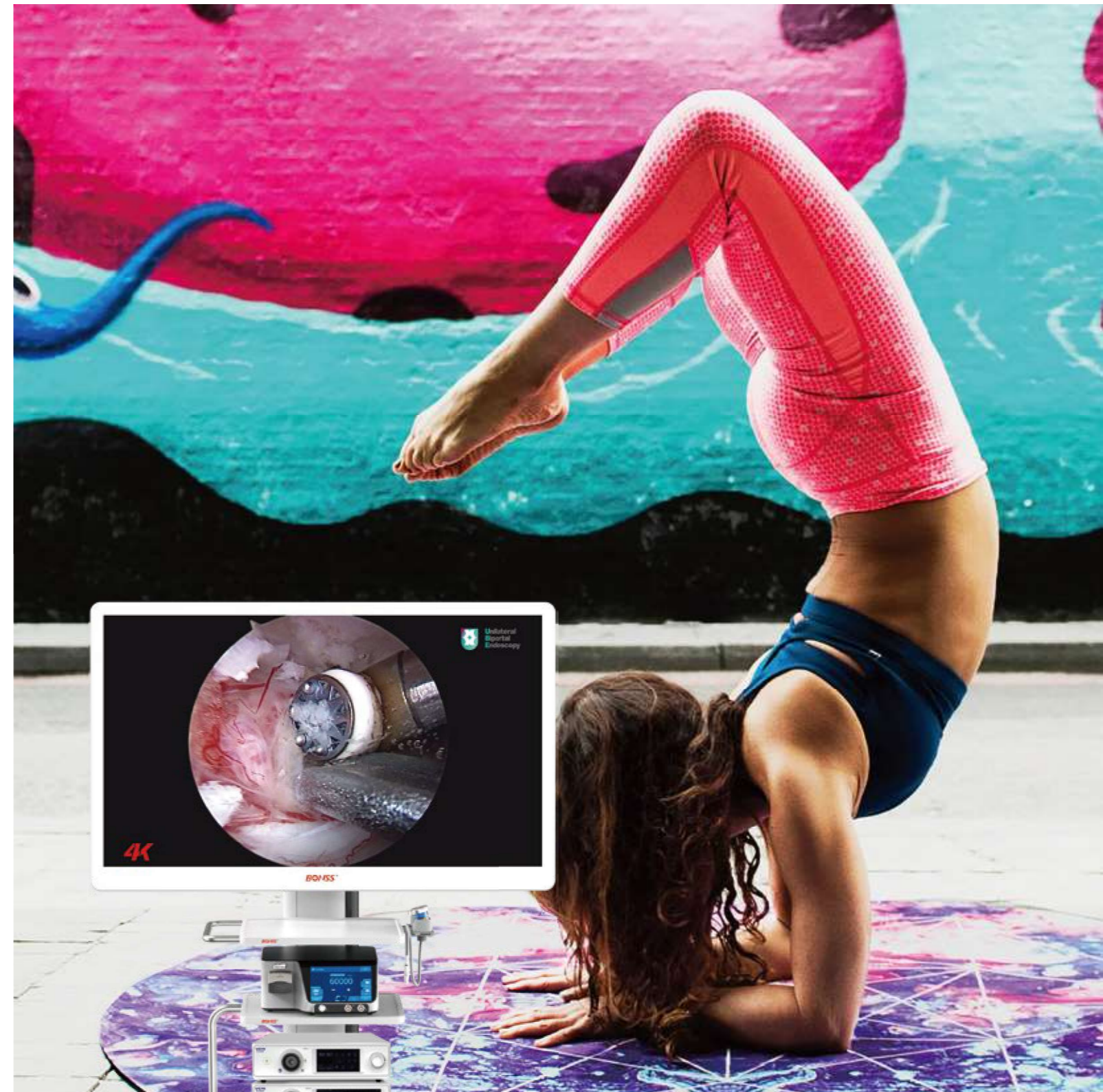
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The information is for internal reference only. The products listed are drawings and subject to the actual product.

BS-P File V UBE 2024.2



**An Overall Solution of Spine
Unilateral Biportal Endoscopy**



BONSS[®]
MEDICAL

Unilateral Biportal Endoscopy
brings more possibilities for your
spine surgery



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brings more possibilities for your spine surgery

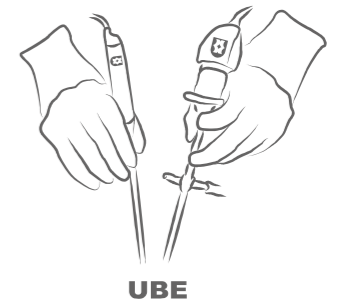
Minimally Invasive Spine Unilateral Biportal Endoscopy (UBE) is indicated for cervical, thoracic and lumbar degenerative lesions. By UBE, it can complete endoscopic fusion surgery. Unlike uniportal endoscopy, UBE typically creates two portals. One is for observation, and the other is for instrument operation. The 0° or 30° observation endoscopes are often used in the observation portal, and the instruments specialized for biportal endoscopy are often used in the instrument portal, such as Curette, Punch, Nucleus Pulposus Forceps, Root Retractors, Special Biportal Burs, Special Plasma Electrodes, etc. There is UBE instrument kit specially designed for UBE.

UBE is a minimally invasive spine endoscopy surgery, with wide indications

Indicated for almost all degenerative lesions (disc, stenosis, fusion)

Indicated for almost all segments (cervical, thoracic, lumbar)

Indicated for Ordinary Disc Herniation, Central Canal Stenosis, Lateral Recess Stenosis, Foraminal Stenosis, Extreme Lateral Disc Herniation, Degenerative Spondylolisthesis, Lumbar Revision, Cervical Spondylotic Radiculopathy, Cervical Spondylotic Myelopathy, Thoracic Lesions. By UBE, it can carry out Herniated Nucleus Pulposus Removal, Canal Decompression and Intervertebral Fusion, etc.



Basic Steps of UBE



Location

Portals Dilatation

Workspace Building

Decompression

End

Advantages of UBE

- Small diameter observation endoscope, Big operating space, Wide movement range;
- Suitable for both special biportal instruments and traditional spine surgical instruments due to no limit by special portal. Ordinary size instruments can handle hyperplasia and degenerative tissues with higher efficiency;
- Easier to handle stenosis cases;
- Under water operation for clearer field of view, maintain continual water flow with special instruments;
- Regular posterior approach for low learning curve;
- Wide indications. It can easily complete fusion endoscopy, and complex cases on cervical spine, thoracic spine and lumbar spine, etc



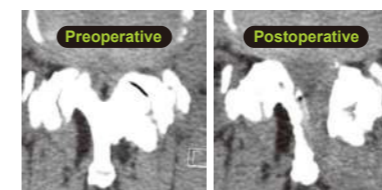
UBE technology in clinical practice

UBE Case

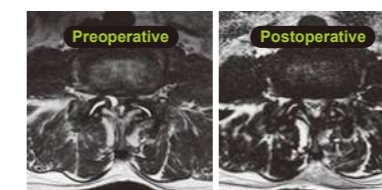
Decompression of Spinal Stenosis by UBE

Patient, male, 71 Years old, Both lower limbs pain, numbness, heavy left side, and foot drop

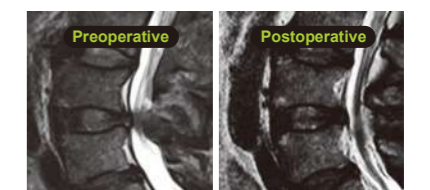
CT Result: severe stenosis in L4/5 segment, obvious hyperplasia of articular process joints, and a large osteophyte on the lamina surface.



Preoperative and postoperative comparison of CT



Intervertebral disc level (Confirmed as a cyst during surgery)



Sagittal Section

Plasma Electrodes

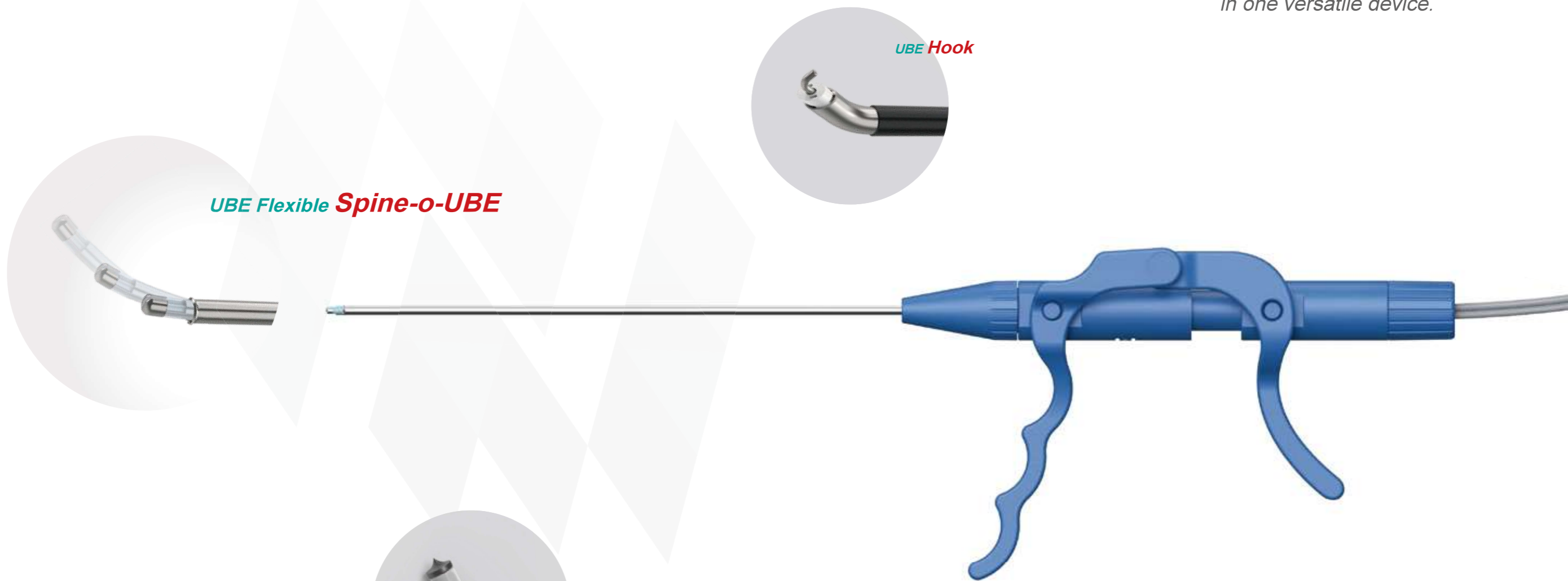
UBE is an innovative and efficient surgical solution, which is able to meet the needs of dealing with different parts and tissues with various electrodes. It has significant clinical effect and high surgical safety, with the advantages of short surgery time, high efficiency, small tissue damage, less scar residue, light pain, and fast recovery.

A revolutionary surgical solution for spinal degenerative diseases such as spinal stenosis and spondylolisthesis, with safe, fast, and efficient surgical outcome.

Comprehensive solutions of RF Plasma Electrodes designed for UBE

Specially designed for UBE surgery to reduce the risk of nerve damage

Integrated with cutting, ablation, coagulation, hemostasis, stripping capabilities in one versatile device.



UBE Flexible Spine-o-UBE

UBE Hook

UBE Needle



With decades of crucible and promotion in research and development of RF Plasma Surgical System, BONSS has developed the Unilateral Biportal Endoscopy (UBE) solution for minimally-invasive spine surgery, with specialized, patented and integrated surgical electrodes for intraspinal and extraspinal surgery.
UGD - Retractable electrode design makes the surgery simple and convenient, no need of changing among different electrode types during surgery;
UXD - Unique angle and insulation design ensures safe operation, and optimized coagulation effect.

BONSS RF Plasma Surgical System has become an integral part of UBE surgery.

UXD

Perfect solution for extraspinal canal in UBE surgery

RF Plasma Surgical System

Revolutionary **precise reaction technology**

Patented Innovative Design for UBE Extraspinal Surgery
Fully indicated for multiple anatomical sites of soft tissue
(including cartilage) and clinical applications for various diseases



UXD

Powerful and Efficient

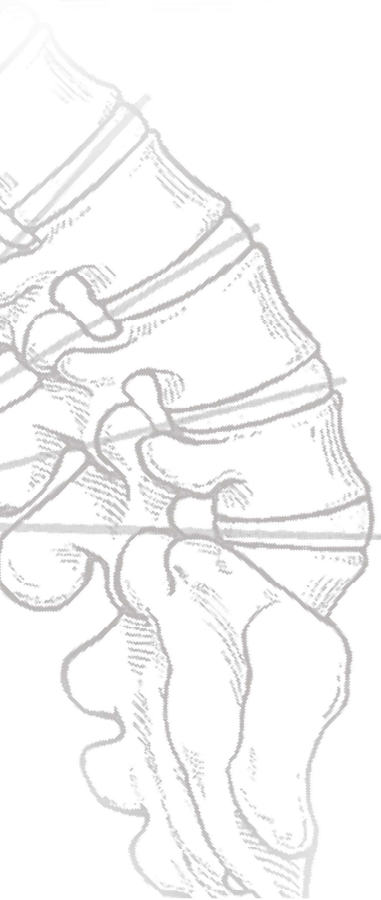
Insulation design of the front end reduces nerve tissue damage and makes surgical operation safer

Super suction performance reduces intraoperative bubbles for clearer surgical vision

Special coating avoids tissue adhesion of the tip and continuously ensures low temperature operation

Integrated Design

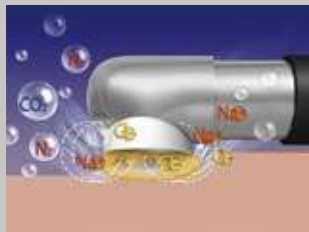
With enhanced visibility and more controllable cutting accuracy, the electrode with both suction and cutting functions is used for rapid resection of various soft tissues. In addition to removing bubbles from the field of view, the great suction power attracts small floating tissues to the tip, which enables the surgeon to focus on the surgery without disturbing from the floating tissues.



ARS Radio Frequency PlasmaSurgical System



How it works



ABLATE (Cutting & Ablation)

The Radio Frequency energy flows through active electrode and return electrode, and by the conductive saline solution it generates precisely focused plasma sheath of 100µm thin plasma layer 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. The lesion is decomposed into simple molecules, atoms, and low-molecular-weight gases (oxygen, nitrogen, hydrogen, and carbon dioxide) after cutting and ablation by low temperature plasma.

COAG (Bipolar Coagulation & Hemostasis)

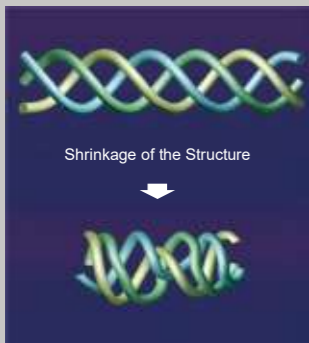
Strong vessels closure function

Effective control of bleeding

The RF Plasma Surgical System is added with a macro-variable power supply module in addition to the plasma generator. Through the feedback signal from the electrode and the tissue, that module can generate a lower plasma voltage and radio frequency peak waveform between the working electrode and the target tissue. Corresponding changes in the RF voltage, waveform, and peak value would gradually reduce the proportion of the plasma threshold, and at the same time would generate the RF effect threshold. The ratio of plasma ablation effect and radiofrequency coagulation hemostasis effect changes with the change of power value setting. At a high COAG power value setting, the plasma ablation effect is bigger thus the better plasma ablation outcome is realized. When the COAG power value setting is low, the radio frequency coagulation effect is bigger to achieve better coagulation and hemostasis effect.

Advantages of Shrinkage Function:

Different from the other heat shrinking technology that realizes necrosis of tissues by high temperature, the RF plasma technology can accurately control the temperature at 40-70°C, which can not only ensure the shrinkage of the helical structure of collagen molecules, but also to maintain cell vitality.



Excellent Performance

Systematic Working Modes

Two working modes:

ABLATE for cutting 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.



Adjustable Coagulation Capability

ABLATE (Plasma ablation & cutting): 1-9 settings adjustable;

COAG (RF& Plasma coagulation & hemostasis): 1-9 settings adjustable. This innovative "Plasma & Radio frequency" coagulation and hemostasis function can form thrombi in blood vessels to achieve the sealing effect.

Smart Recognition, Simplified Design

The console can automatically identify the connections of electrode, foot switch, and power cord, and has corresponding displays and indicators on the control panel. When the electrode is properly connected, the default power setting would be selected automatically. Integrated with the intelligent design, the console can precisely adjust the power value of the same setting according to different target tissues.

Automatic Protection

The patented electrical circuit system can constantly monitor power output and automatically suspend power output when there is instantaneous peak current. It would automatically suspend radio frequency output when electrode contacts metal, and automatically resumes work after electrode has returned to a proper distance.

Cutting and Ablation under Endoscopy

ARS Radio Frequency Plasma Surgical System has unique endoscopic cutting and ablation function. The system and electrodes have been tested according to the standards of endoscopic surgery by the health authorities, being able to safely and effectively perform foraminal endoscopic surgery. With precise endoscopic ablation, it avoids nerve reflexes and ensures the smooth performance of intervertebral disc surgery.

Dual/Triple Foot Switch (optional)

The foot switch, which is waterproof pressure-resistant and convenient to use, can support two working modes of ABLATE (ablation & cutting) and COAG (coagulation & hemostasis), each identified in different colors and different working sound settings.

The triple foot switch can easily realize the power setting adjustment of ABLATE on the foot switch. No need to adjust the power setting on the console control panel.



Temperature Control Feedback Technique

This Plasma technology provides a Controlled and Non Heat-driven process to gently dissolve target tissues at relatively low temperatures of 40-70°C. Integrated with temperature control feedback technology, the system automatically optimizes output value according to the plasma layer status around the electrode tip and the target tissue feature, by which the electrode can ensure a stable and efficient performance while keeping at the lowest working temperature.

Precise Work Control System

Under conventional discography, the specialized plasma surgical electrode of less than 1mm diameter ablates the nucleus pulposus tissue within a temperature range of 70°C with plasma energy penetration controlled at 200µm, creating effective decompression and plasty of intervertebral disc.

Integrated Function

In one versatile single-use electrode, it provides ABLATE for cutting, resection and ablation, COAG for coagulation and hemostasis, and suction capabilities. The integrated suction electrode enhances surgical vision, controlled resection for rapid removal of soft tissues.