

Takes the Pain

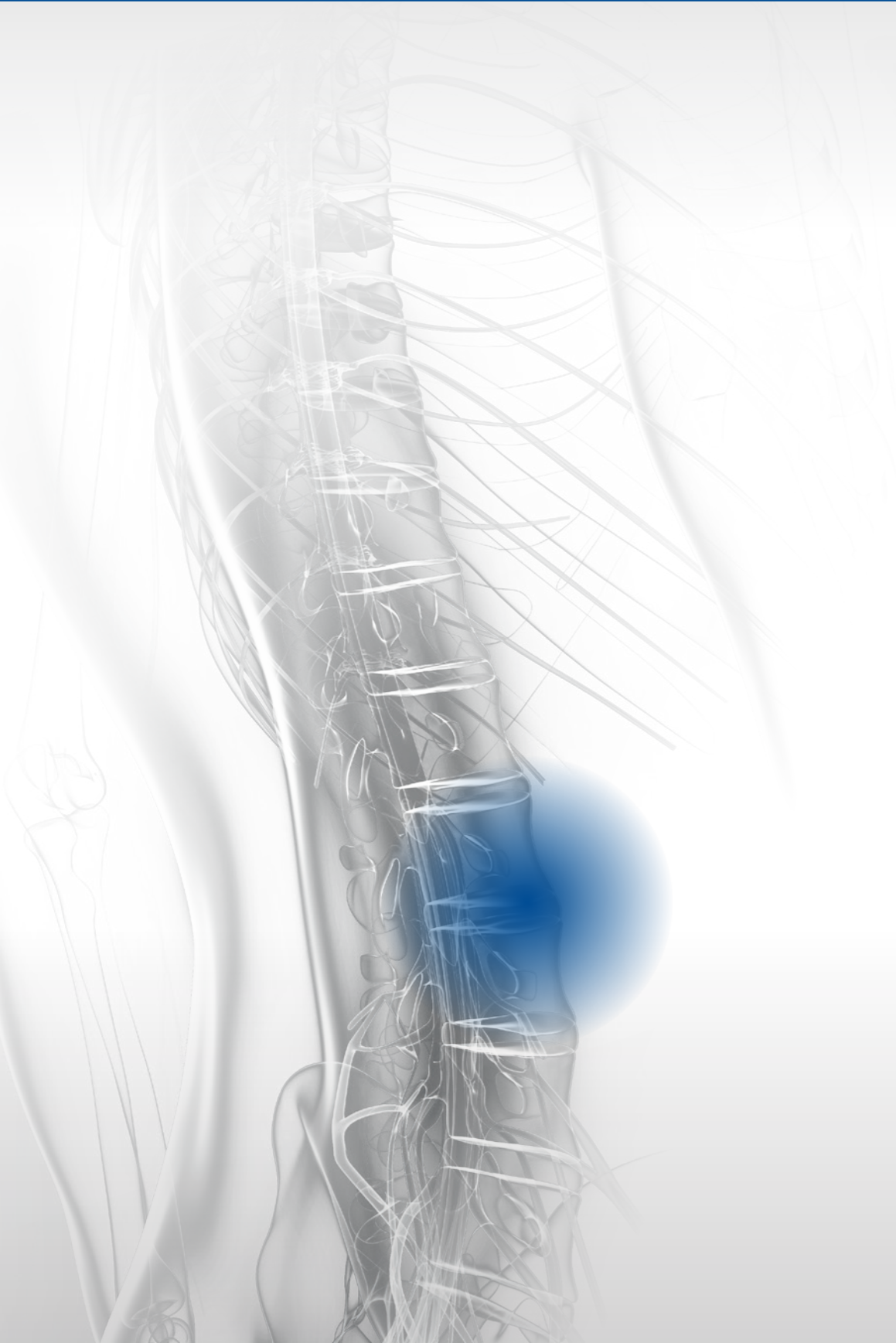


PERCULINE nucleole

Interventional percutaneous 4 MHz radiofrequency nucleoplasty of the vertebral disk

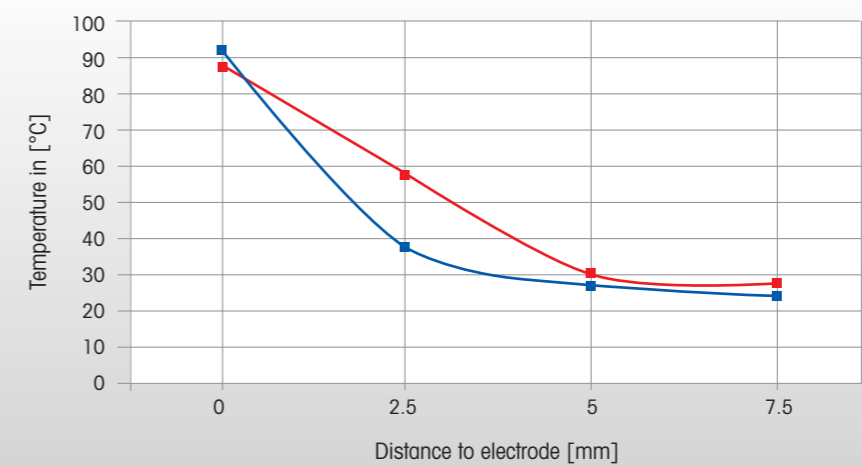
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At a glance



Precise and tissue conserving

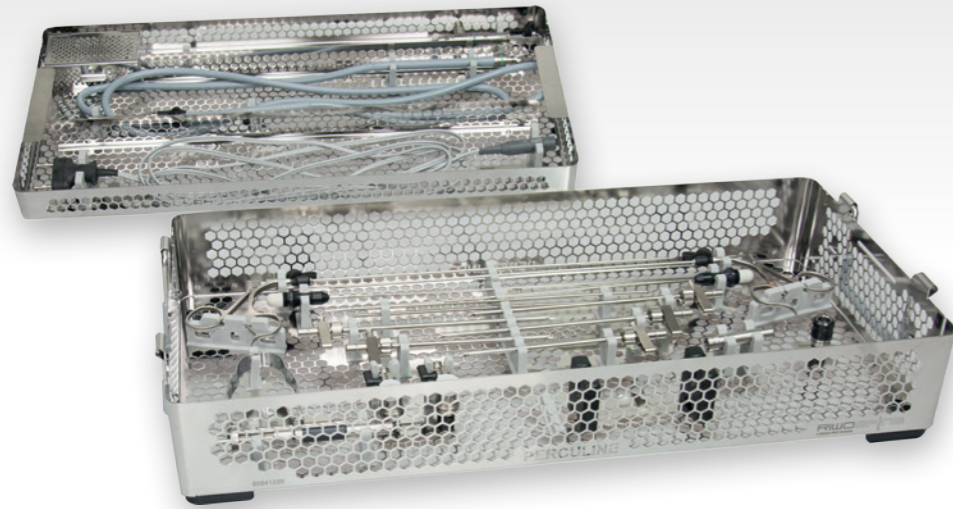
The Radioblator RF4 Radiofrequency Generator with a working frequency of 4 MHz is the centerpiece of an effective tissue-preserving coagulation system. By comparison with standard radiofrequency devices supplied commercially in the marketplace, the electricity frequency of the Radioblator RF4 is approximately 10 times higher. While safe coagulation and ablation of the tissue can be achieved at the electrode through contact with the tissue, neighboring areas of tissue experience significantly less heat (see picture). The occurrence of thermally induced tissue necrosis and irritations in adjacent nerves are thereby minimized. The actively articulating TipControl RF Electrode facilitates the controlled positioning of the radio frequency application in the tissue.



The temperature profile in the muscle tissue depends on the distance to the bipolar electrode tip and the device frequency.

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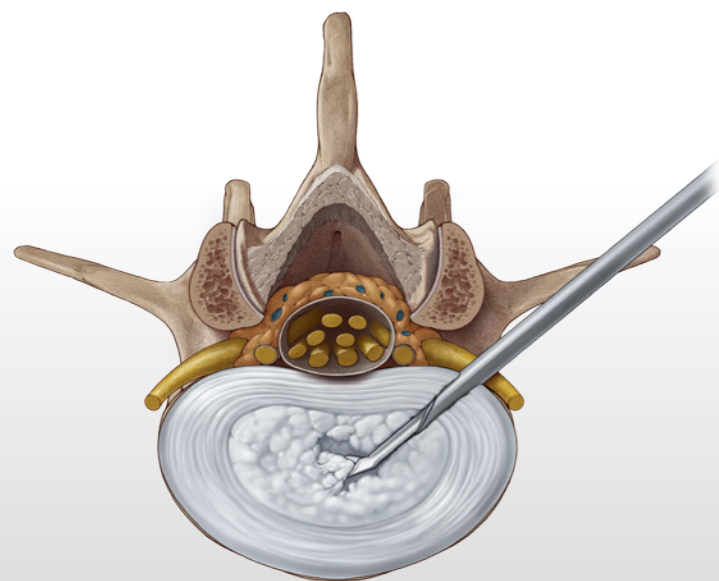
At a glance



Multifunctional and endoscopically assisted

Additional instruments such as biopsy and grasping forceps can be inserted in the working sleeves as necessary. This enables additional decompression of neural structures by means of larger volume reduction of the vertebral disk.

Using a mini-endoscope permits direct visualization of the interior of the vertebral disk and visual control and documentation of the therapy.



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Pathologies and therapeutic target

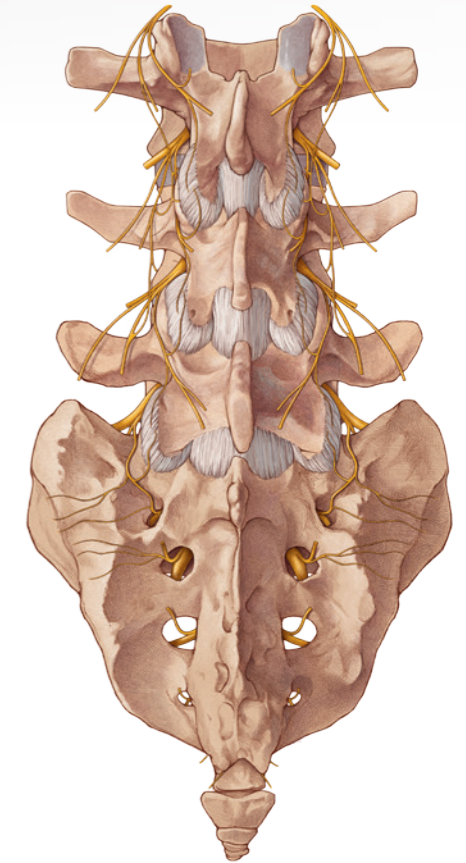
Diskogenic pain syndrome

Diskogenic pain syndrome is one of the degenerative diseases (wear-related) of the spine. The cause of diskogenic pain syndrome is degenerative wear of the vertebral disk, starting with a loss of fluid in the inner core of the vertebral disk (nucleus pulposus). Since the vertebral disks then lose resilience and elasticity, this can lead to segmental instability. Hyper mobility in the affected segment, sheering loads and restrictions of the mechanical properties of the vertebral disk cause inflammatory reactions as a result of this.

Sensitization of the region can result in a reduction of the stimulus threshold and lead to chronic diskogenic pain. The vertebral disk is regarded as the trigger for pain, even if there is no disk herniation.

Furthermore, protrusions of the vertebral disk can press on the spinal and extra-spinal nerve structures and generate radicular pain as a result.

Percutaneous nucleoplasty uses 4 MHz radiofrequency current to selectively reinforce the vertebral disk tissue (volume reduction) and to destroy the small nerve fibers at the fiber ring of the vertebral disk using ablation. The spinal nerves are indirectly decompressed and the destruction of the nerve fibers prevents conduction of pain information to the brain.



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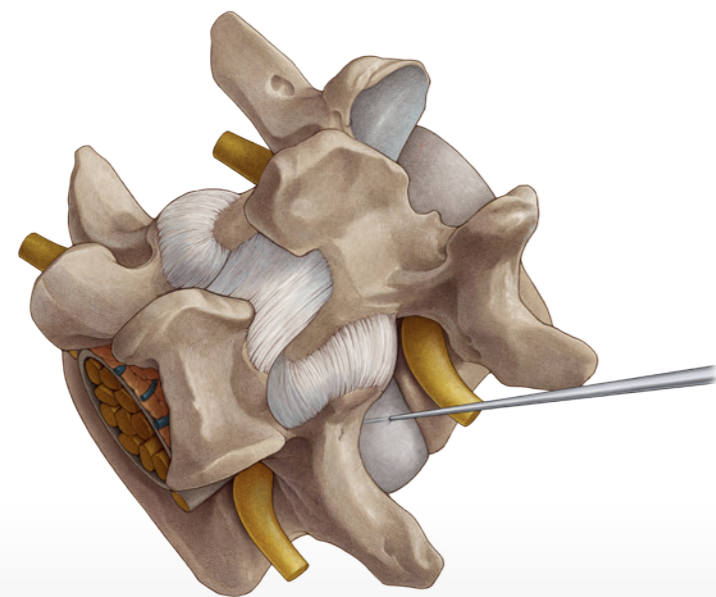
Interventional approach for 4 MHz radiofrequency nucleoplasty of the vertebral disk

Patient positioning, setup and anesthesia

The patient is in the prone position with slightly bent knees. The operating area and the C-arm are covered with sterile drapes. The intervention is generally carried out under local anesthesia.

Positioning the cannula and guide wire

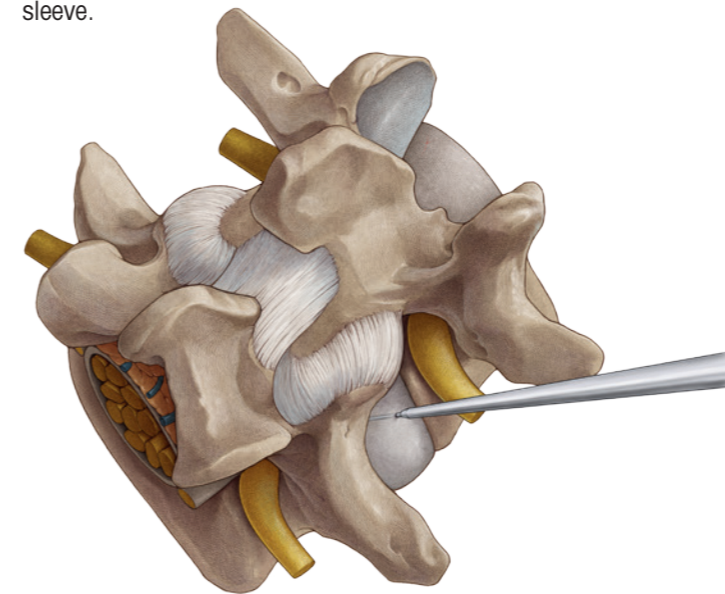
Marking the entry point of the cannula on the skin surface under AP and lateral X-ray control for a posterolateral access port. Application of local anesthetic and placement of the puncture cannula under X-ray control in the vertebral disk. Replacement of the puncture cannula with a guide wire.



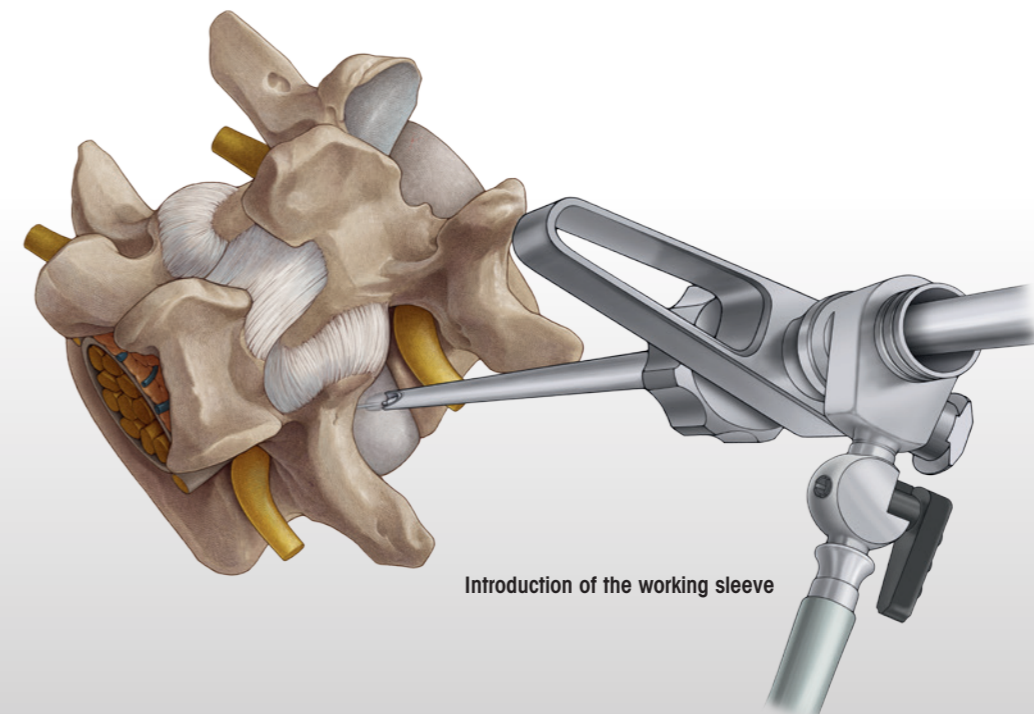
Posterolateral access of the puncture cannula to the vertebral disk

Introduction of the dilator and working sleeve

Introduction of the dilator using the guide wire under X-ray control. Introduction of the working sleeve using the dilator and moving the working sleeve further forward through the fiber ring of the vertebral disk by knocking slightly with a hammer until the inner core has been reached. This is also carried out alternately under AP and lateral X-ray control. Connection of the irrigation fluid to the working sleeve.



Dilation of the access port



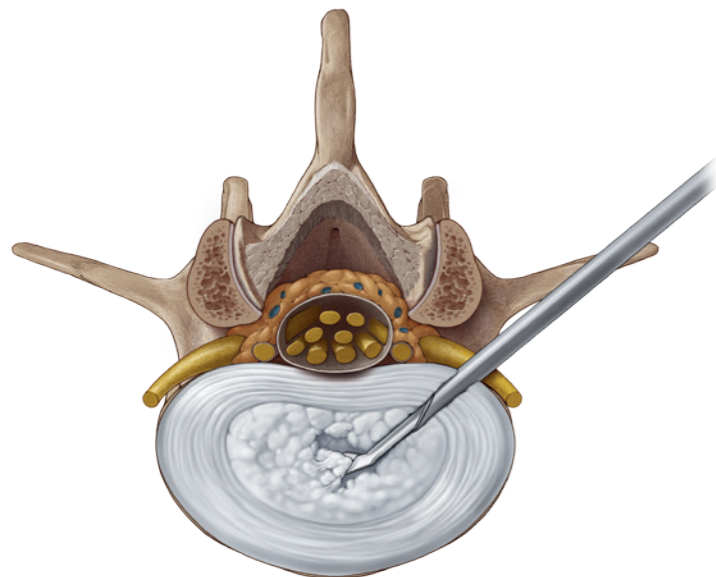
Introduction of the working sleeve

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Interventional approach for 4 MHz radiofrequency nucleoplasty of the vertebral disk

Introduction of the biopsy or grasping forceps for manual removal of tissue

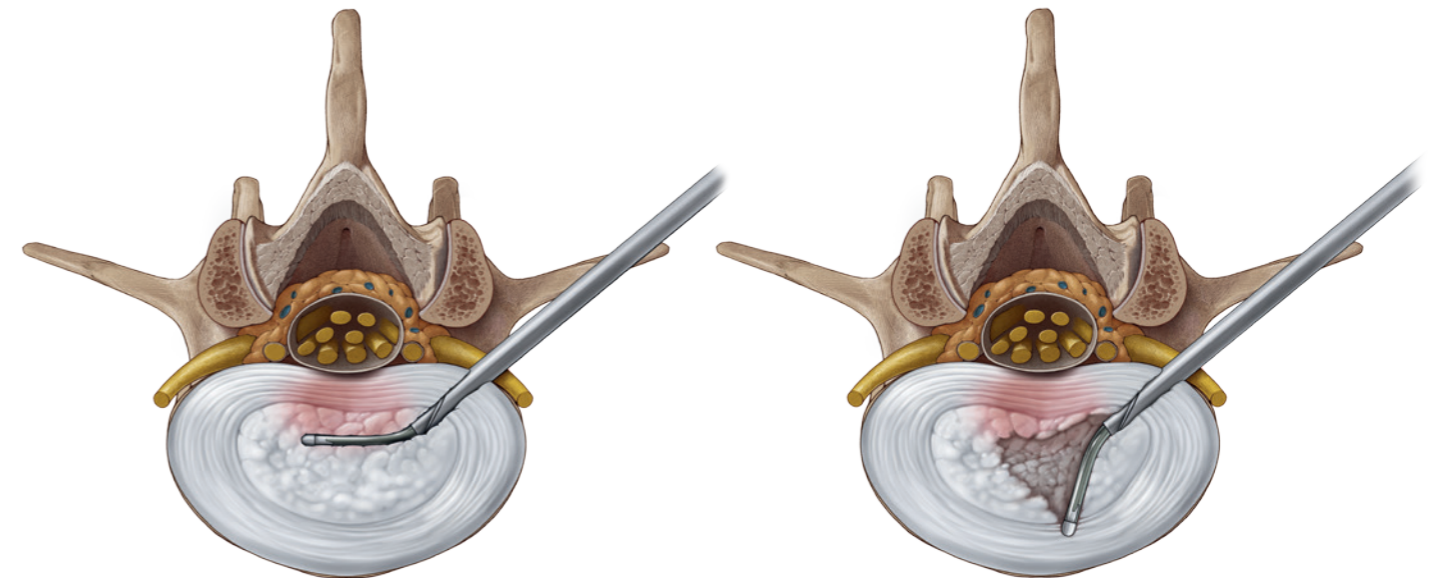
Introduction of biopsy or grasping forceps through the working sleeve into the inner core of the vertebral disk and volume reduction by removing tissue from the vertebral disk under X-ray control.



Introduction of manual instruments for removal of tissue

Radiofrequency application TipControl RF Electrode

Introduction of the TipControl RF Electrode into the cavity created and activation of the RF application (Bicut2 and Precise Mode) with the foot switch for tissue shrinking of the inner core of the vertebral disk and as necessary for coagulation of the inner fiber-ring parts of the vertebral disk for electrothermal denervation.








Application of the TIPControl RF Electrode

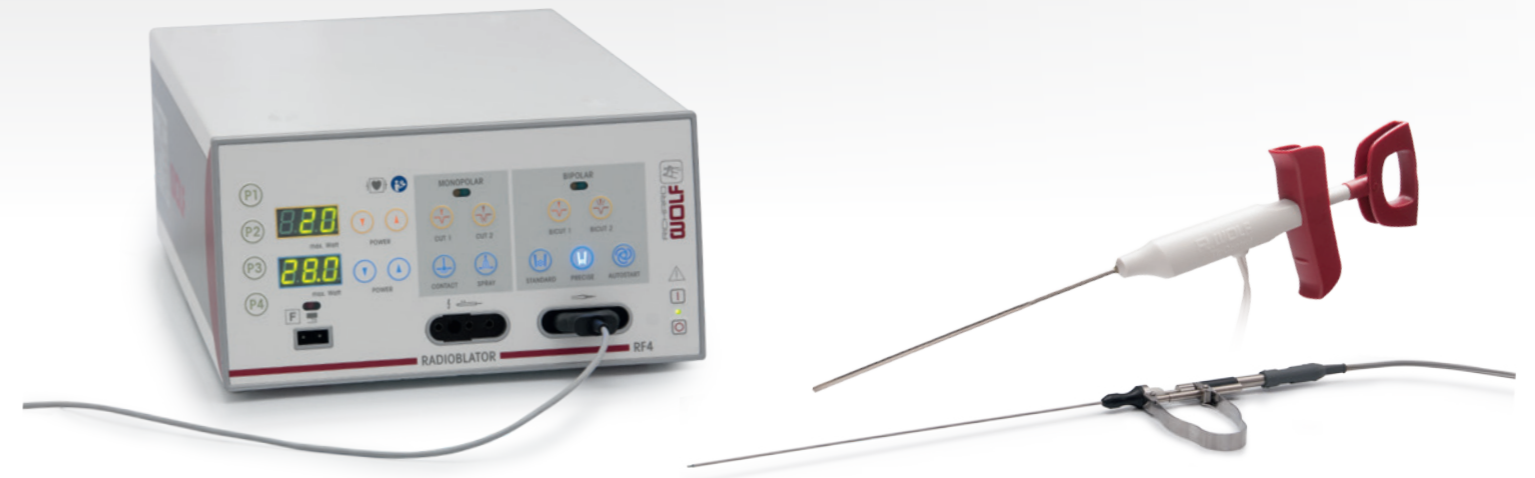
Introduction of the mini-endoscope through the working sleeve into the vertebral disk and monitoring and documentation of the therapy







The endoscope connected to an endoscopic camera and light source can be introduced through the working sleeve into the vertebral disk for visualization of the vertebral disk.

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Instruments for 4 MHz Radiofrequency Nucleoplasty

Instruments	
Access instruments	
	WORKING SLEEVE OD 4 mm, WL 160 mm for denervation, graduated892209204
	DILATATOR ID 1 mm, OD 2.9 mm TL 230 mm892209404
	SPINAL CANULA SET OD 1.25 mm, WL 150 mm, Pack = 10 PCS, sterile4792.803
Working instruments	
	RONGEUR Ø 2.6 mm, WL 290 mm color code orange, TL 388 mm, with irrigation connection, reusable.....89240.2025
	PUNCH Ø 2.6 mm, NL 290 mm color code orange, TL 388 mm, with irrigation connection, reusable.....89240.2225
Accessories	
	FLUSHING ADAPTER FOR WORKING SLEEVE OD 7 mm reusable.....89220.1307
	ACL-HAMMER TL 248 mm reusable.....8866.956
	STERILIZATION BASKET PAIN THERAPY Basket lower part with integrated small parts basket, brackets made of silicone and 2 handles, basket lid with lock85841226
Endoscope	
	FIBER LIGHT CABLE BNDL , consisting of: 80662523 Fiber Light Cable Ø 2.5 mm, TL 2.3 m, 8095.09 Adapter endoscope side, 8095.07 Adapter projector side806625231
	TELESCOPE 0°, Ø 2 mm, WL 268 mm rigid, TL 365 mm, semi-rigid image carrier8754.401
Radiofrequency Surgical System	
TipControl RF Instrument, bipolar, sterile	
	TIPCONTROL RF INSTRUMENT BIPO Ø 2.5 mm, WL 280 mm for endoscopic spine surgery, flexible insert, integrated connection cable WL 3 m with device plug to Radioblator RF 4 MHz, sterile, for single use4993691
	TIPCONTROL RF INSTRUMENT BIPO Ø 2.5 mm, WL 280 mm for endoscopic spine surgery, flexible insert, integrated connection cable WL 3 m with device plug to US 2-PIN, sterile, for single use.....49936911



TipControl RF Instrument, bipolar	
	TIPCONTROL RF INSTRUMENT BNDL SHORT , consisting of: 899351100 RF Electrode handle bipo, 899351010 sheath tube Ø 2.5 mm, SL 290 mm899351000
	TIPCONTROL RF ELECTRODE BIPO Ø 2.5 mm, WL 290 mm, for endoscopic spine surgery, flexible, Pack = 5 PCS, sterile, for single use.....499351000
	TIPCONTROL CONNECTION CABLE BIPO WL 3 m, 2 PIN international plug, connection to EU flat plug, reusable.....899351210
Accessories	
	SHEATH TUBE Ø 2.5 mm, SL 290 mm, compatible with TipControl handle bipolar, reusable.....899351010
	TIPCONTROL CONNECTION CABLE BIPO WL 3 m, US 2 pin plug, connection to EU flat plug, reusable.....899351220
Radioblator RF 4 MHz 4 MHz working frequency – precisely focused and tissue preserving, monopolar and bipolar cutting and coagulation mode, program memory for 4 User Presets	
	RADIOBLATOR RF 4 BNDL , consisting of: 2330001 Radioblator RF 4, 2330901 footswitch 2 pedals, 2330045 connection cable mono WL 3 m, 2440.03 power cable23300011

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innovation