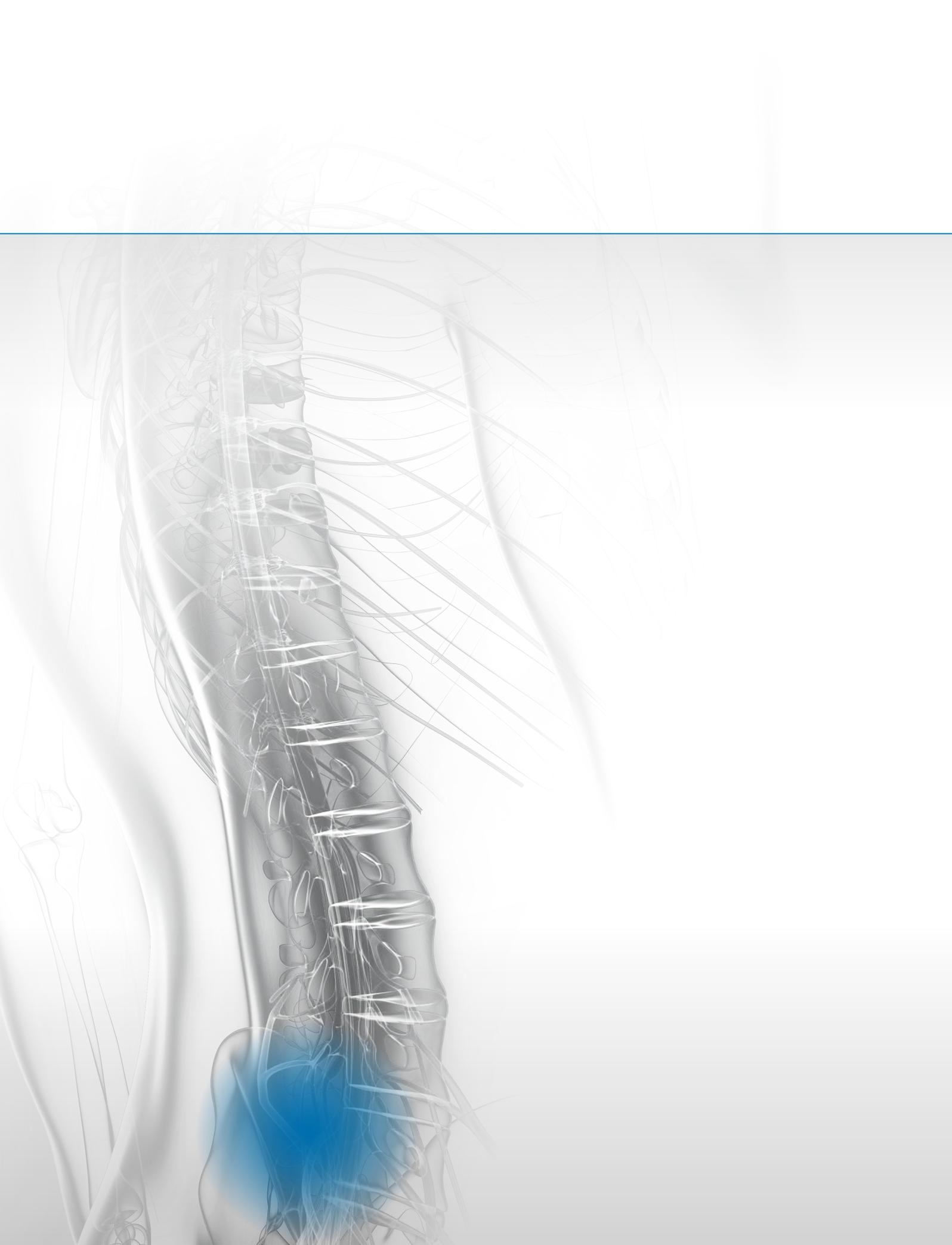


Focus on freedom
from back pain



VERTEBRIS denervation

Full-endoscopic denervation
of facet and sacroiliac joint



Radioblator RF 4 MHz

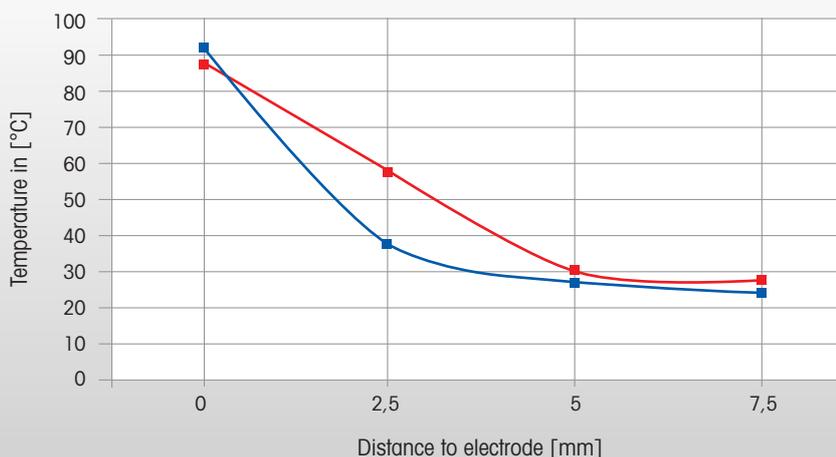
At a glance



Precise and tissue conserving

The Radioblator RF4 Radiofrequency Generator with a working frequency of 4 MHz is the centerpiece of an effective tissue-preserving radiofrequency-surgical-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 nerve structures 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 radiofrequency application in the tissue.

4 MHz



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

—■— 350 kHz device
—■— 4 MHz device

VERTEBRIS denervation

Expanding the horizons for spine surgery

The VERTEBRIS denervation instrument system has been specially developed for endoscopically controlled facet and sacroiliac joint denervation and offers a complete and effective solution in combination with the Radioblator RF Generator. This improves the treatment outcome through visually controlled and precisely focused energy input.



4 MHz

The Advantage of endoscopic control

Full-endoscopic surgery of the spine has now achieved an established status for specific surgical indications within the overall concept of surgery. The minimally invasive portal means that the intervention is more patient-friendly, and the direct visualization provides the surgeon with better information and control than with x-ray.

Modular design, more options

If indications change, the modular design of the system permits conversion from the denervation procedure to another surgical approach, such as joint biopsy or partial joint resection.

Focus on freedom from back pain

The modular system offers impressive advantages:

- Excellent endoscopic visualization with the PANOVIEW Plus Discope
- Unique, precisely focused and tissue-saving 4 MHz radiofrequency technology
- Precise energy delivery with the TipControl RF electrode
- Optimal working length of the endoscope permits treatment of several stages from a single puncture point
- Working channel of the endoscope and sheath diameter specially designed to match the target area
- Modular, expandable system for additional functions (biopsies, resections)
- Economically effective with a minimum of disposable components

VERTEBRIS denervation

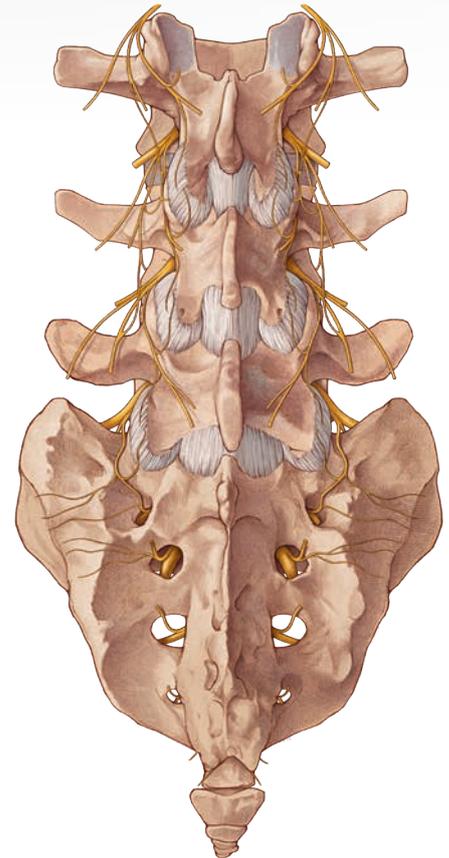
Pathologies and therapeutic target

Facet and sacroiliac joint syndrome

The facet-joint syndrome is part of the degenerative (wear-related) diseases of the spine. The cause of the facet-joint syndrome is generally due to wear of the intervertebral disks starting with a loss of fluid. Since this means that the disks lose resilience and elasticity, it can lead to segmental instability and as a result put additional stress on the facet joints. The increased stresses exerted on the synovial joint membrane frequently generate mechanical inflammatory reactions. Ultimately, this leads to spondylarthrosis. The people affected by facet joint syndrome are primarily over the age of 50. The main location for presentation of this clinical picture is the area of the lower lumbar spine, although symptoms can also occur in the vertebral joint (facets) of the cervical spine, and very rarely at the vertebral joints of the thoracic spine.

The small vertebral joints (facet joints) are surrounded by a dense network of nerve fibers. These are irritated by inflammatory processes which occur as part of arthrosis. However, direct mechanical irritation is also possible as a result of instability. Leading symptoms are therefore back pain or neck pain without significant spreading and without neurological deficits. The pain is conducted along the medial branches of the dorsal ramus of the spinal nerve. The objective of radiofrequency denervation is therefore selective thermal destruction of these nerve fibers in order to permanently interrupt the conduction of pain.

Alongside the small vertebral joints, the sacroiliac joint (SIJ) is frequently a generator of back pain. The mechanisms are similar here. The sacroiliac syndrome frequently occurs after stabilization of the spine because the sacroiliac joint is subject to a greater load and this in turn leads to mechanical and inflammatory irritations of the nerves at this joint. Pain also results mainly in further transmission of pain along the dorsal ramus of the spinal nerve. Also, ventral branches may be involved in pain transmission, which can have an influence to the results compared to the facet syndrome. This can also correspondingly be eliminated thermally where the nerves exit the sacrum.



VERTEBRIS denervation

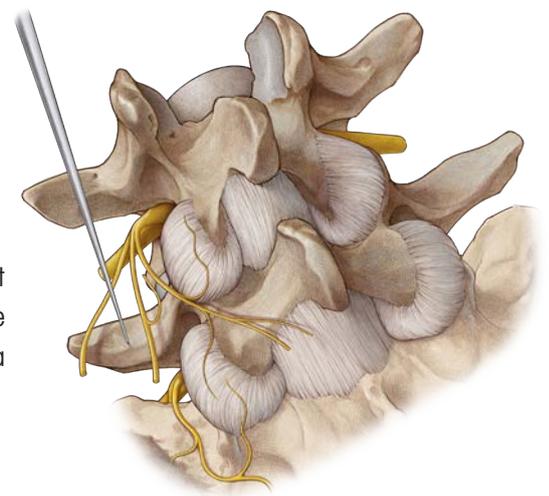
Procedure for endoscopic radiofrequency denervation of the facet joints

1. 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 can be carried out under local anesthetic.

2. Positioning the cannula and the guide wire

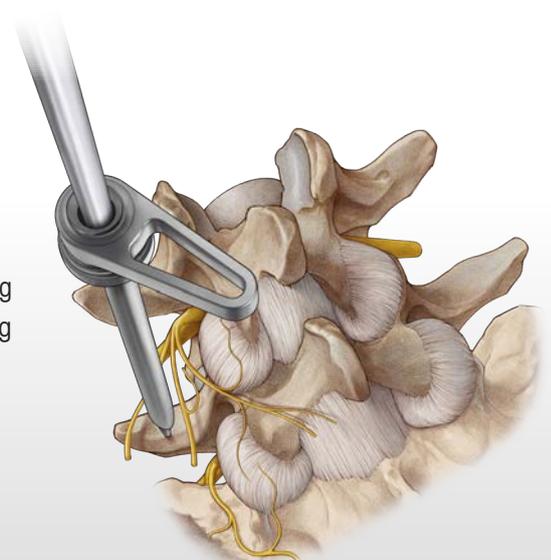
Marking the joint facet on both sides, application of local anesthetic and placement of the puncture cannula under AP X-ray control at the medial transition of the transverse process to the joint facet. Replacement of the puncture cannula by a guide wire.



Positioning the cannula

3. Introduction of the dilator and the working sheath

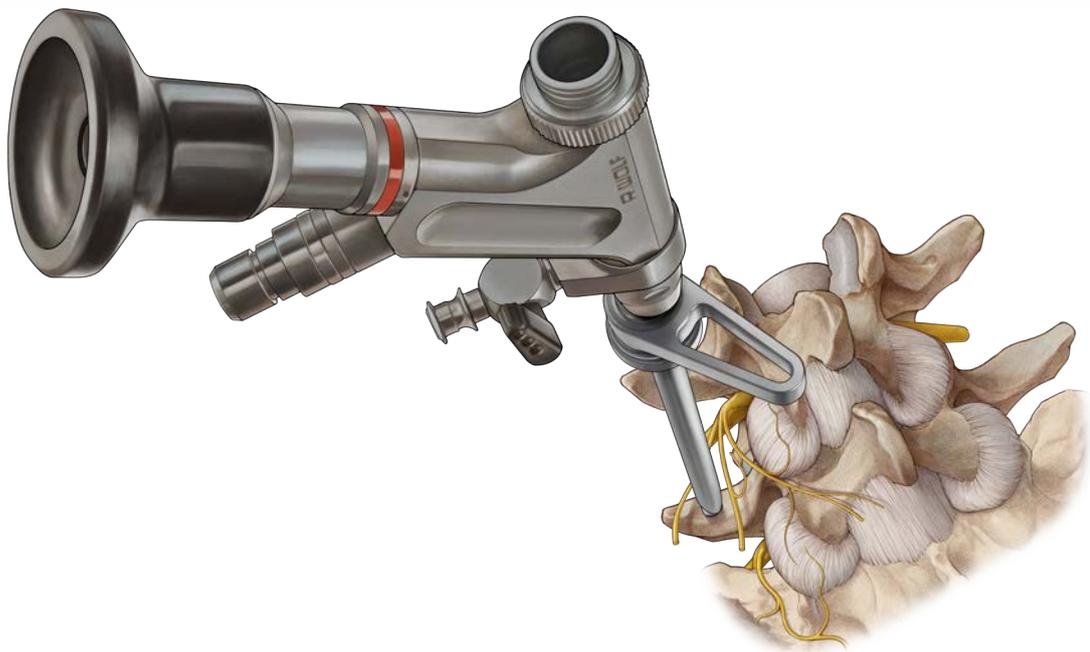
Introduction of the dilator using the guide wire, removal of the guide wire, checking the position of the dilator under AP X-ray control. Introduction of the working sheath using the dilator.



Introduction of the dilator and the working sheath

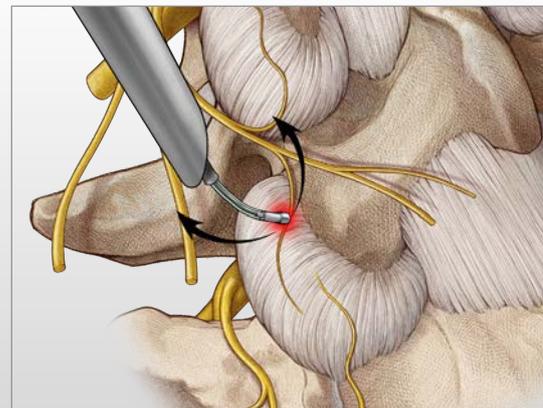
4. Introduction of the endoscope

Introduction of the endoscope for optical control of the procedure and anatomical orientation. Introduction of working tools.



5. Radiofrequency application with TipControl RF Electrode

Introduction of the TipControl RF Electrode and activation of the RF application (Bicut2 and Precise Mode) with the foot switch for denervation of the medial branch of the dorsal ramus. Repeat of the procedure at the adjacent vertebrae above and below and as necessary on the opposite side.



VERTEBRIS denervation

Procedure for endoscopic radiofrequency denervation of the sacroiliac joint

1. Patient positioning, setup and anesthesia

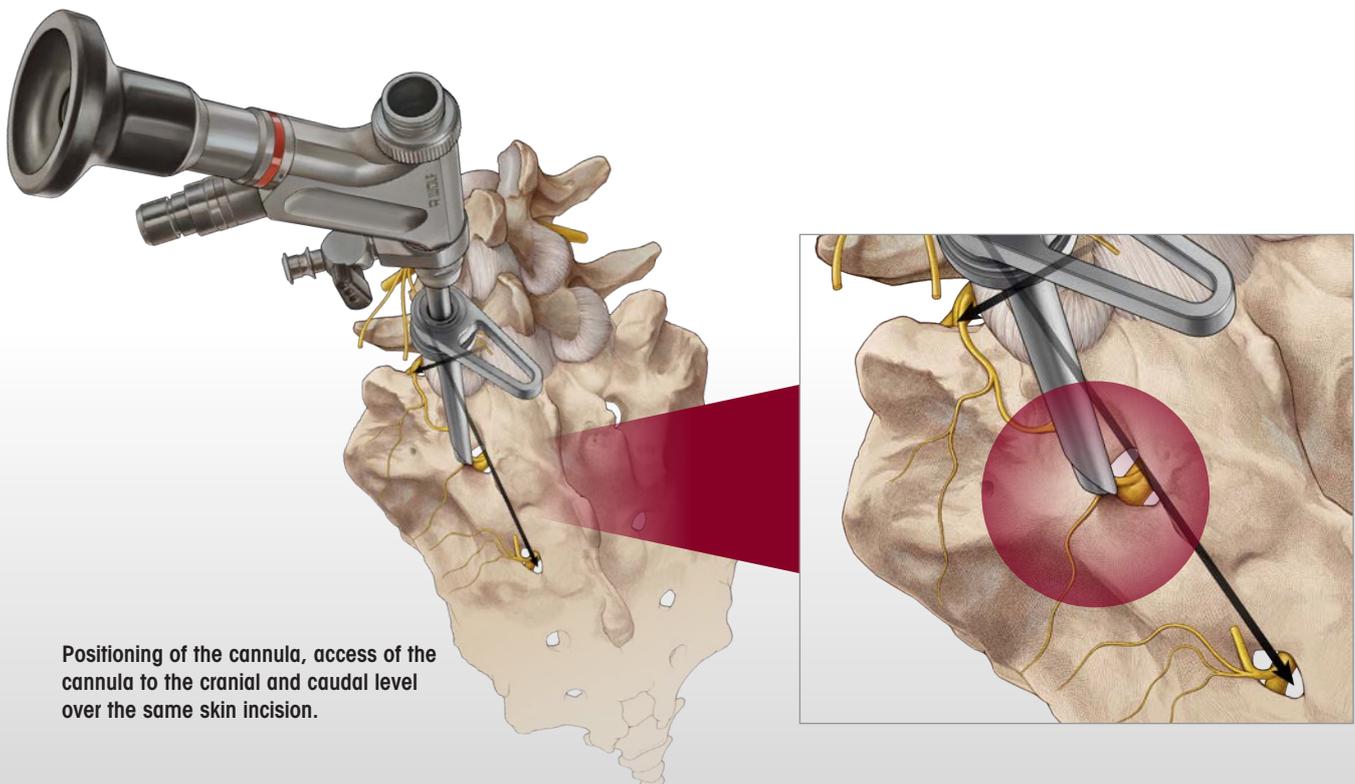
The patient is in the prone position with slightly bent knees. The operating area and the C-arm are covered with sterile drapes. The intervention can be carried out under local anesthetic.

2. Positioning the cannula and the guide wire

Marking the SIJ on both sides under AP X-ray control and visible alignment of the foramina. Application of local anesthetic and placement of the puncture cannula under AP x-ray control at the lateral boundary of the foramen S1/2. Replacement of the puncture cannula by a guide wire.

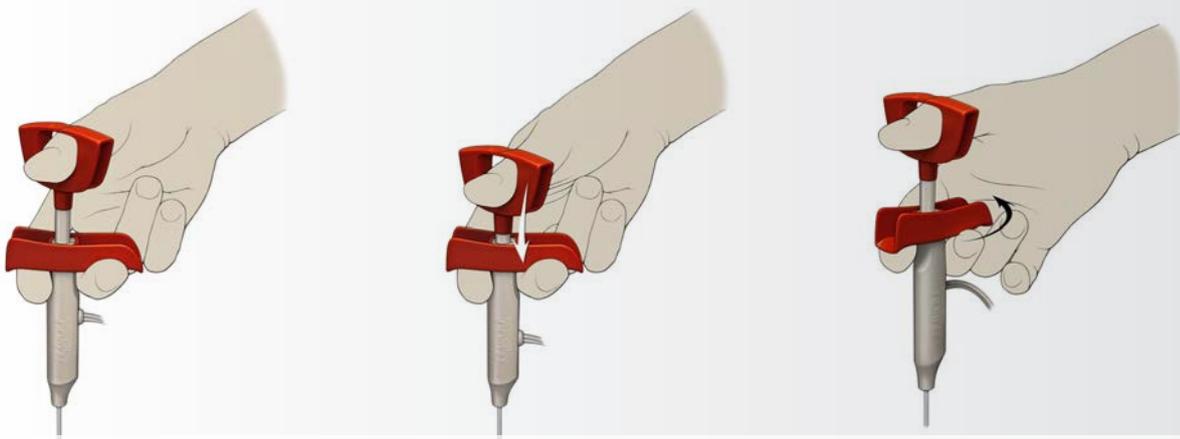
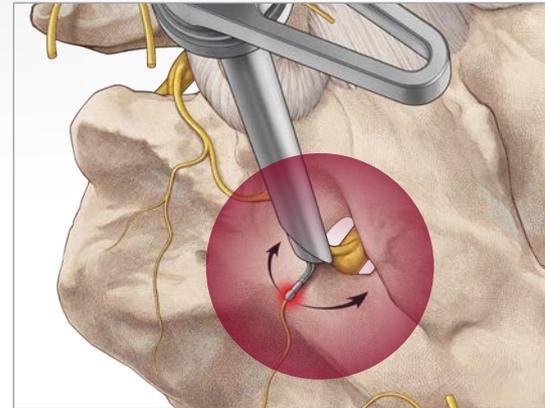
3. Introduction of the endoscope

Introduction of the endoscope for optical control of the procedure and anatomical orientation. Introduction of working tools.



4. Radiofrequency application with TipControl RF Electrode

Introduction of the TipControl RF Electrode and activation of the RF application (Bicut2 and Precise Mode) with the foot switch for denervation along the lateral edge of the foramen. Repeat of the procedure at L5/S1 and S2/3, starting from the same skin incision.



TipControl in use



VERTEBRIS denervation

System Overview

Endoscope	
	DISCOSCOPE 25° Ø 5.9 mm, SL 165 mm, rigid, with lateral ocular lens, working channel Ø 3.1 mm, irrigation channel Ø 1,2 mm, TL 279 mm, rod lens system89210.3253
	FIBER LIGHT CABLE BNDL Ø 3.5 mm, WL 2.3 m, color code orange, with adaptor projector side and adapter endoscope side.....806635231
Access instruments	
	PUNCTURE NEEDLE SET 18G Ø 1,25 mm, WL 150 mm, Pack = 10 PCS, sterile, for single use 4792.803
	PUNCTURE NEEDLE SET 18G Ø 1,25 mm, WL 90 mm, Pack = 10 PCS, sterile, for single use492206112
	DILATOR ID 1.3 mm, OD 5.9 mm, for single-stage dilatation, TL 225 mm, reusable..... 8792.764
	DISCOSCOPE WORKING SLEEVE ID 6 mm, OD 7 mm, TL 166 mm, distal end beveled, graduated, reusable..... 15208.257
	HANDLE ATTACHMENT WORKING SLEEVE OD 7 mm.....89200.1007
Working instruments	
	RONGEUR Ø 2.6 mm, WL 290 mm Color code orange, TL 388 mm, with irrigation connection, reusable89240.2025
	Punch Ø 2.6 mm, WL 290 mm Color code orange, TL 388 mm, with irrigation connection, reusable89240.2225
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 4MHz, 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-use49936911



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 mm 899351000
	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 device plug, connection to EU flat plug, reusable..... 899351210
Accessoires and spare parts	
	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 device plug, connection to EU flat plug, reusable..... 899351220
Radioblator RF 4 MHz 4 MHz working frequency – precisely focused and tissue presserving, 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 cable 23300011

we perform
innovation