modern endoscopy for spinal surgery – by baholzer Endoskopie Systeme

Full HD - Technology- with vision

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flexline®
Das klügere Endoskop gibt nach.

Indications for transforaminal endoscopy

Possible indications for transforaminal endoscopic surgery:

a) Herniated disc

- Contained herniation
- Extruded disc herniation
- Recurrent disc herniation

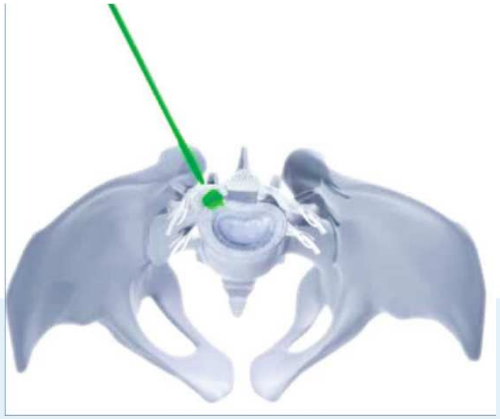
b) Foraminal or lateral recess stenosis

- Facet hypertrophy
- Ligamentum flavum hypertrophy
- Facet cysts

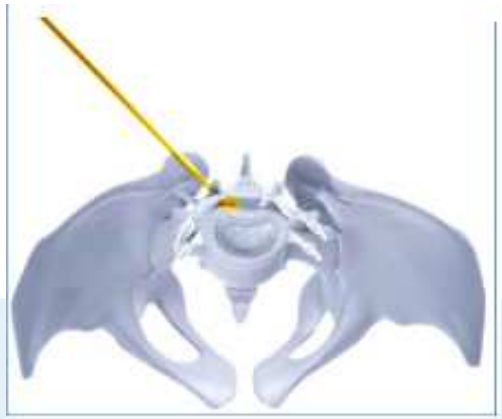
c) Spondylodiscitis

Access / Axial imaging

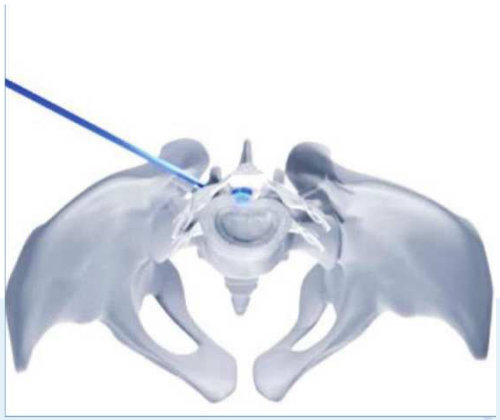
3 Possibilities based on pathology



Extraforaminal



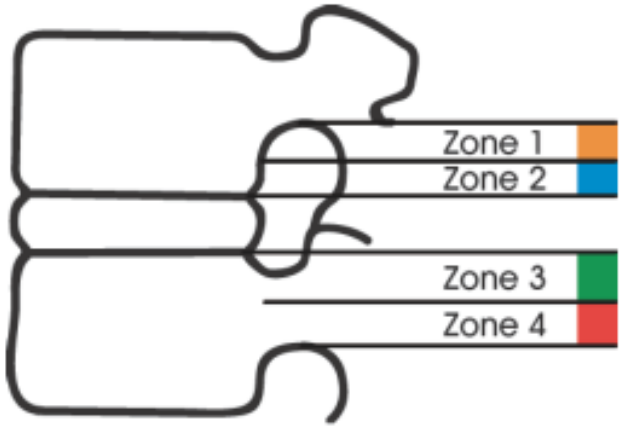
Intraforaminal



Mediolateral entry

Classification of disc migration in four zones

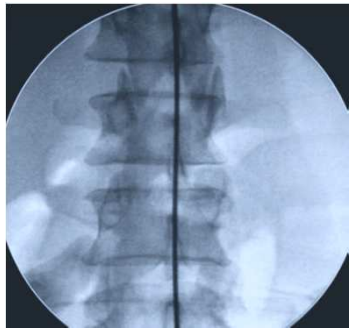
Zone	Direction	Range of distance
Zone 1	Far-upward	From the inferior margin of the upper pedicle to 3mm below of the inferior margin of the upper pedicle
Zone 2	Near-upward	From 3mm below the inferior margin of the upper pedicle to the inferior margin of upper vertebral body
Zone 3	Near-downward	From the superior margin of the lower vertebral body to the centre of lower pedicle
Zone 4	Far-downward	From the centre of lower pedicle of lower vertebral body to the inferior margin of lower pedicle

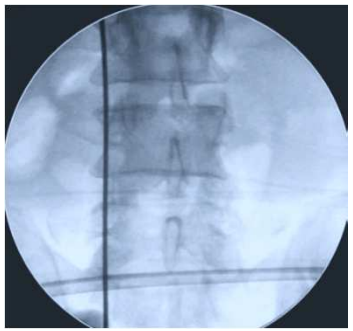


(Scheme1): Radiological classification of migrated disc herniation according to Lee et al.(1).

Prone Position

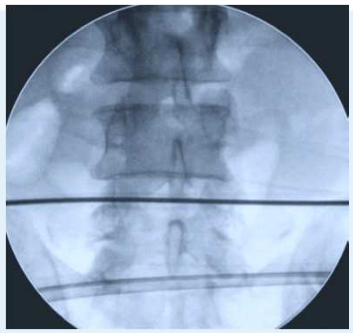
Entry mark

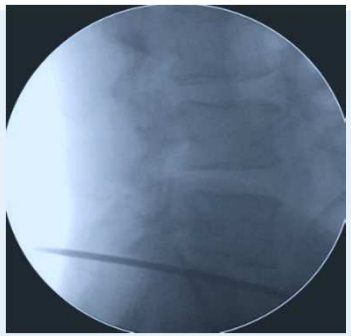




Median and lateral interpedicular line

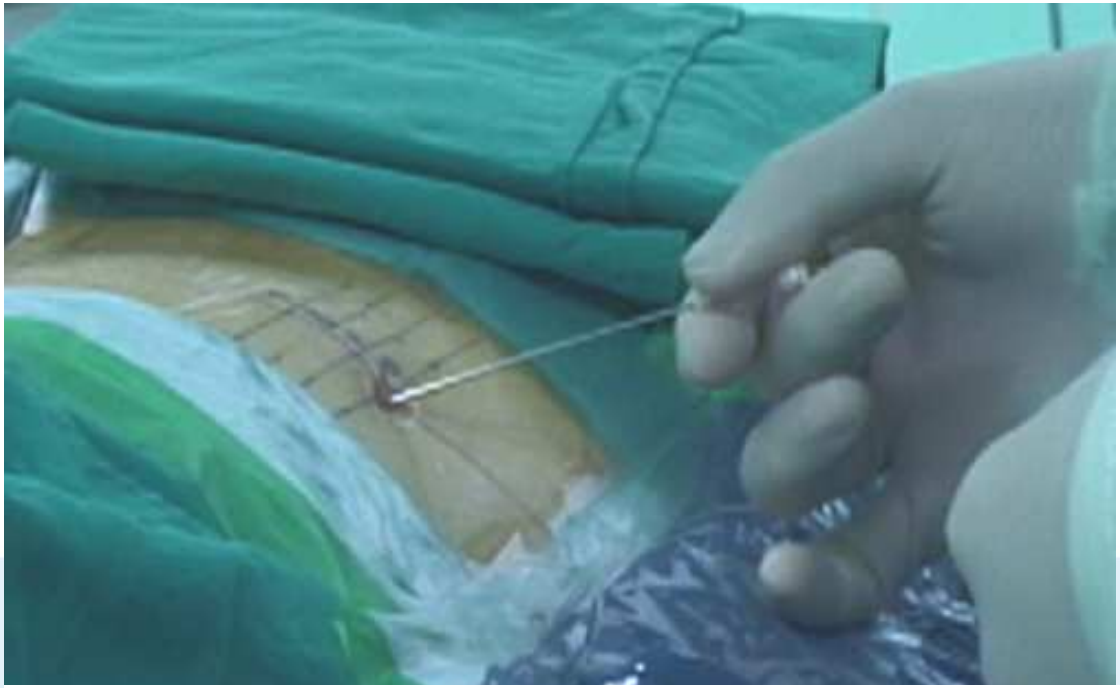
AND
should be drawn on skin

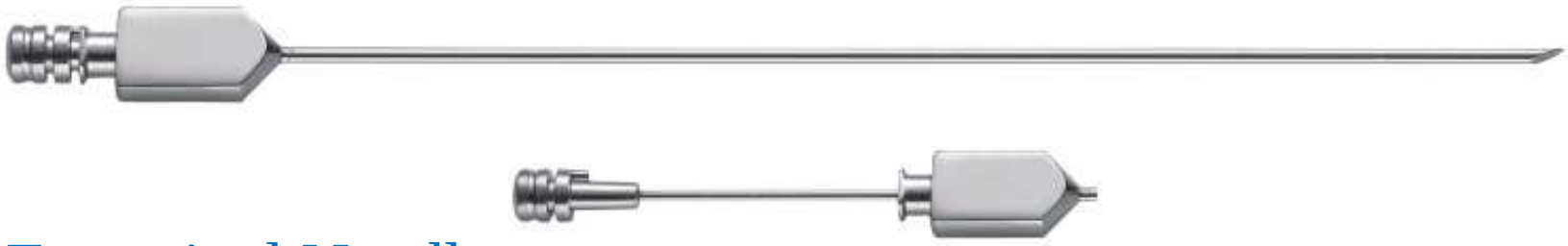




Marked on both AP and lateral X-Ray view

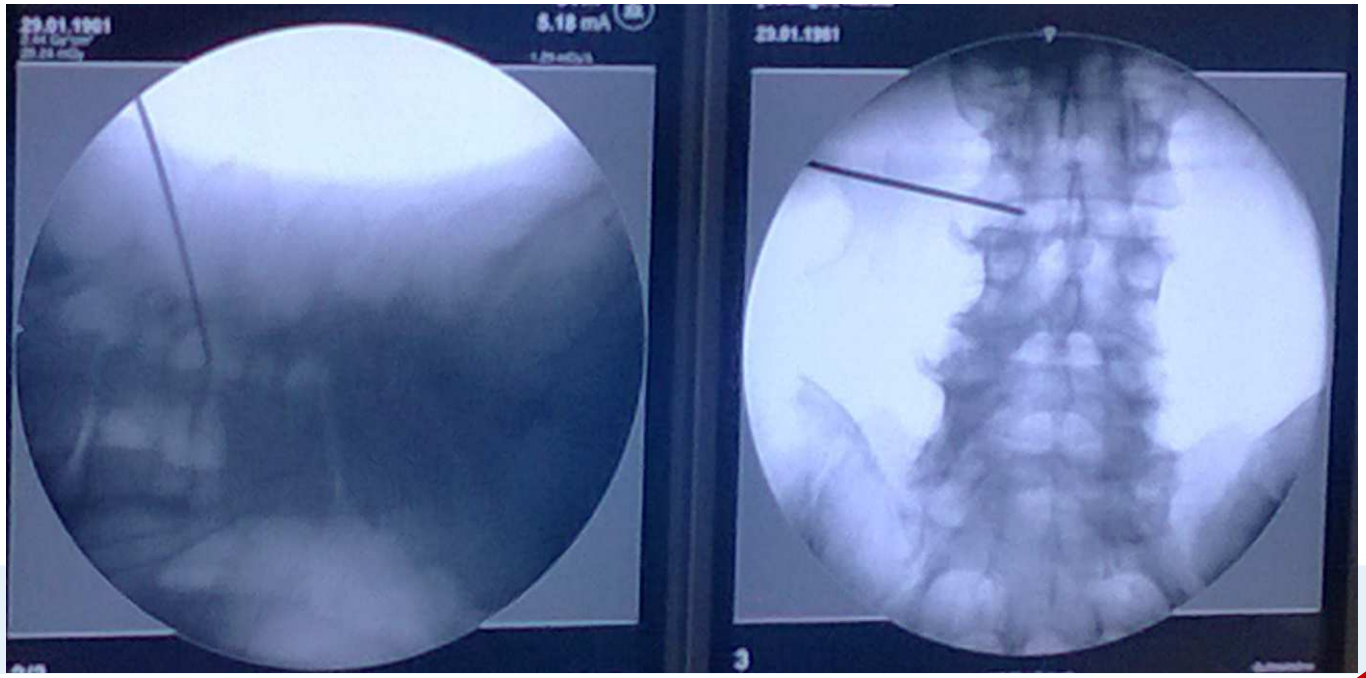
Incision via Spinal needle





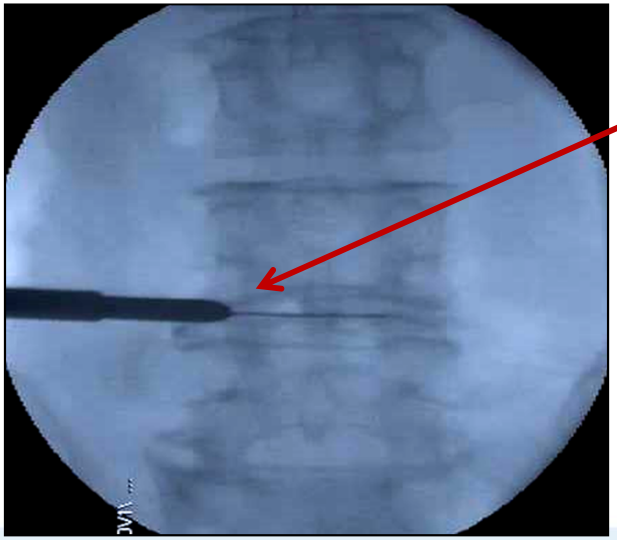
Foraminal Needle

Placement of guide wire



Guide Wire – made of memory metall, higly flexible to avoid unwanted puncture of nerves / etc.

Placement of a dilator / or 2 dilators on sequence

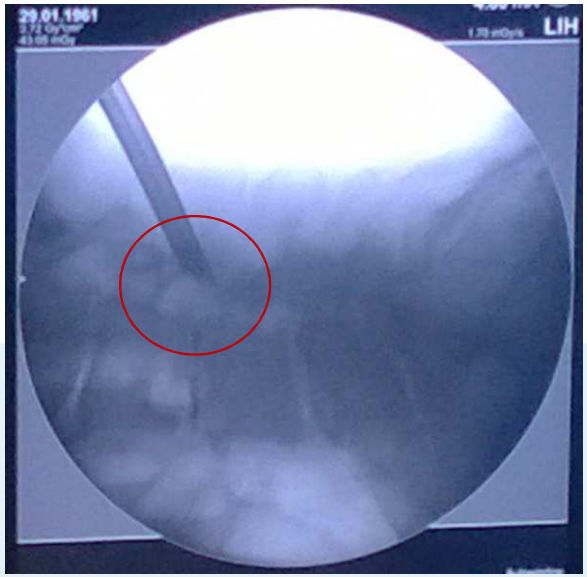


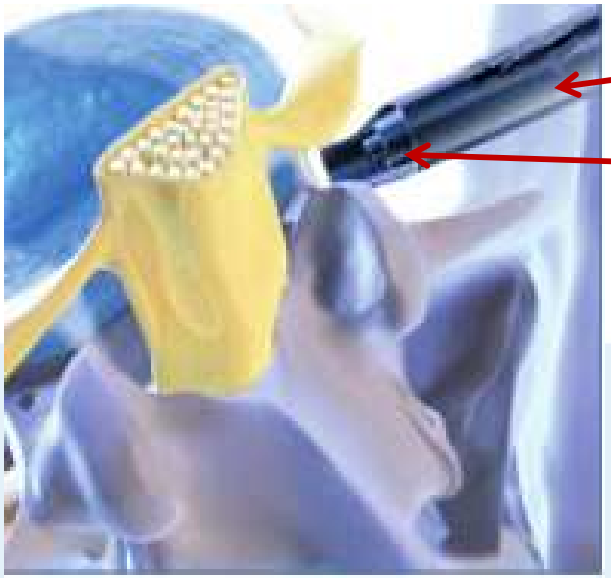
Dilator follows guide wire

Placement of working sheath

I.e.beaked working sheath (WS)

- Placing the WS with beak facing the dorsal aspect of the facet.

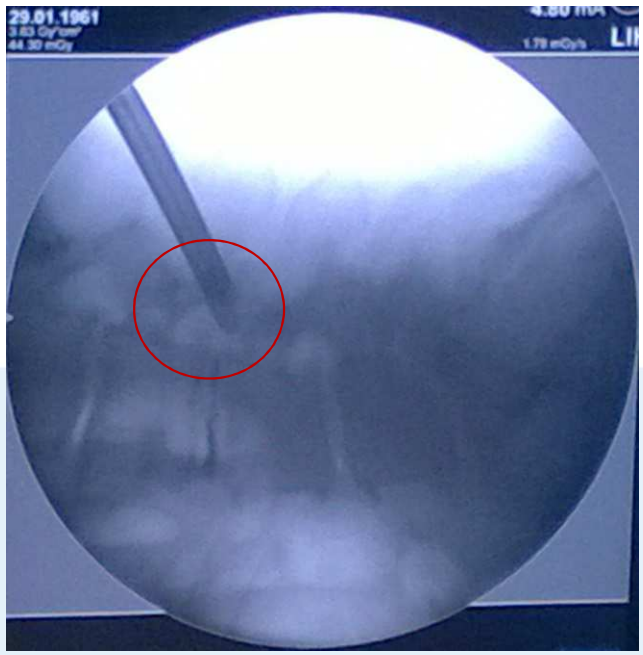


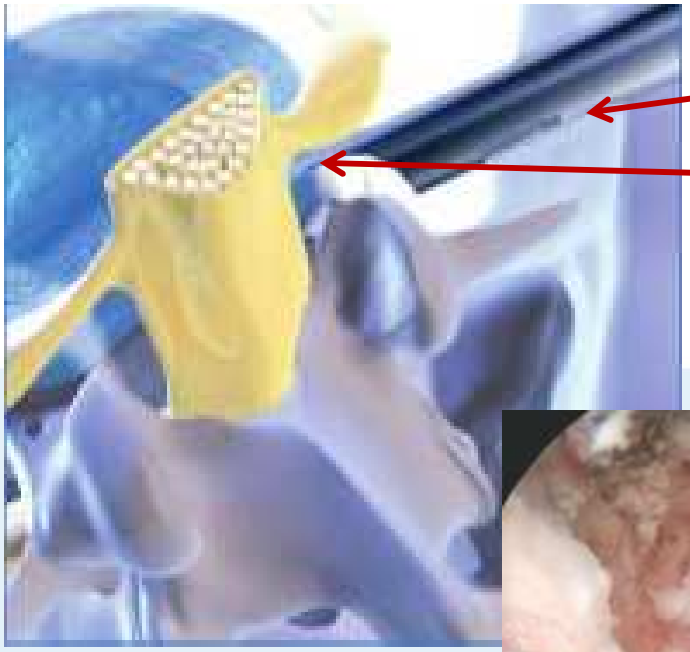


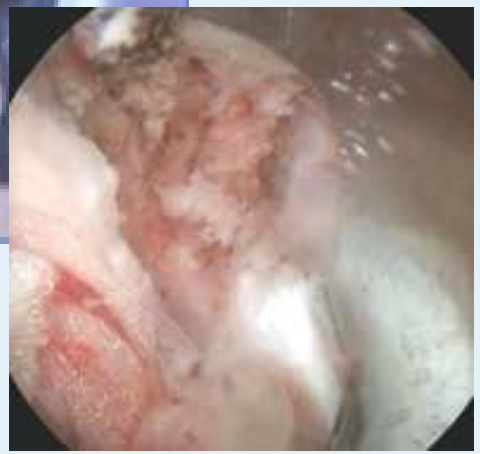
△ Next step / turn the sheath gently to retracted the exiting nerve Root – protect the nerve root with the sheath‘s beak

Placement of working sheath

Next step / turn the sheath gently to retracted the exiting nerve Root – protect the nerve root with the sheath‘s beak



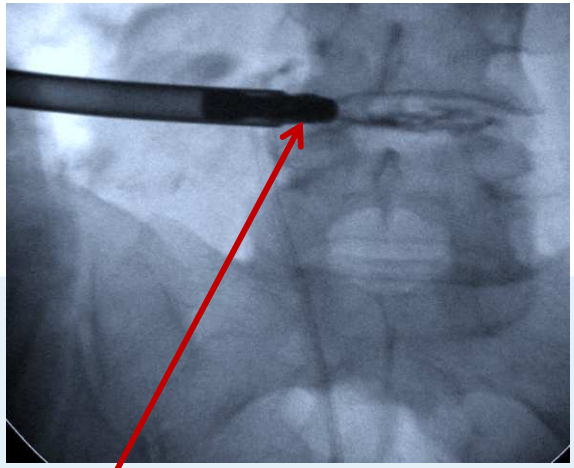




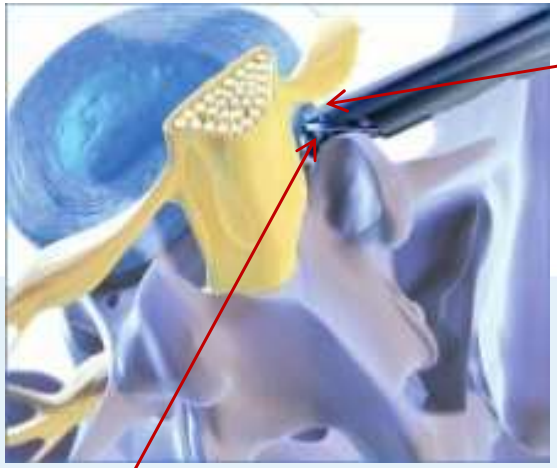
Endoscopic view

Spinal decompression / Foraminoplasty

After the sheath tip protects the nerve root the **side cutting facet rasps** with a saftey blunt tip allow to widen the access to the foramen and spinal canal-

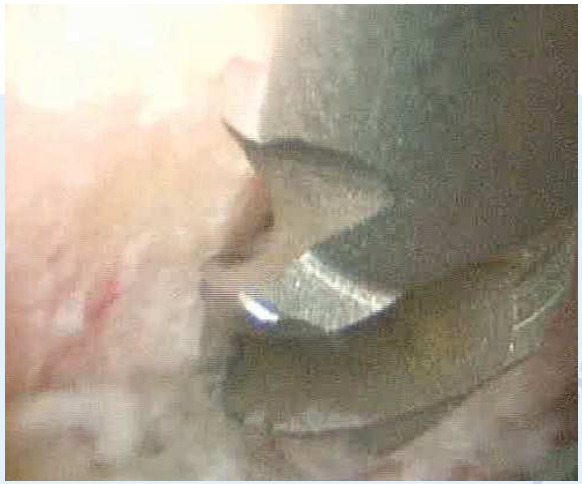


Rasp



Beaked tip
Nerve root protection

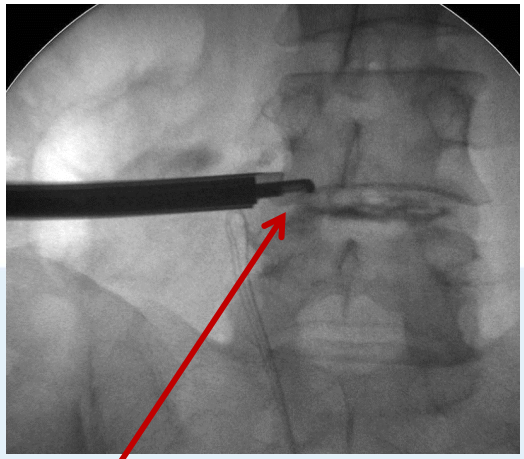
Rasp



Endoscopic view facet rasp

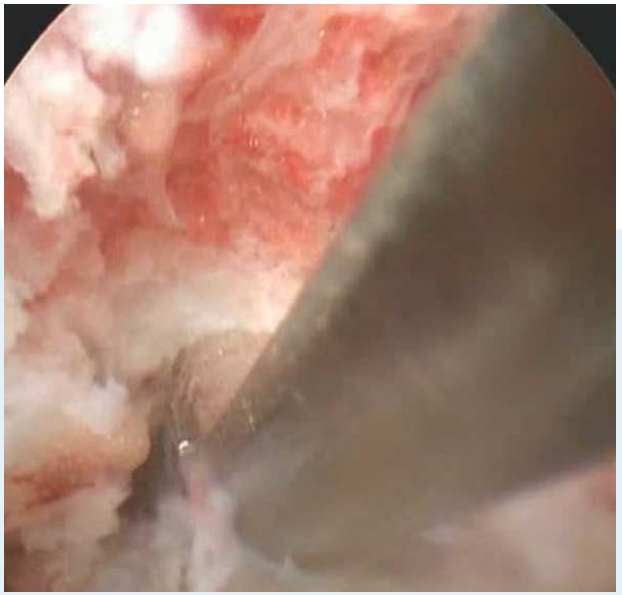
Spinal decompression / Foraminoplasty

If neccessary the foraminoplasty can be further expanded by use of a **side cutting endoscopic Kerrision punch**, introduced through the central working channel of the endoscope.



Kerrison Punch

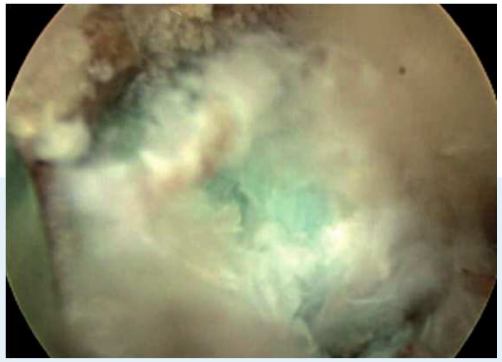
Kerrison Punch



Endoscopic view Kerrison

Disc decompression

The combination of these manoeuvres allows for safe bony decompression and exposure of any migrated disc material and/or relevant stenotic lesion in the lateral recess under endoscopic visualisation.



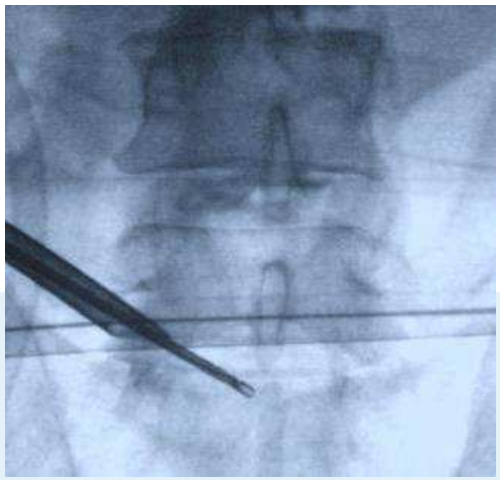
Extraforaminal Sequestrum

Medial Hernia

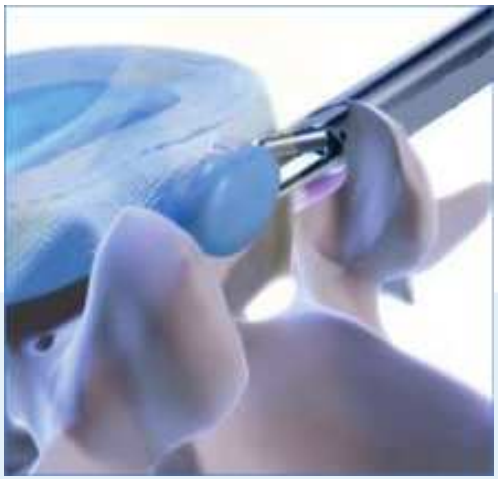
Caudal Sequestrum

Disc decompression

Now, still under endoscopic view, extruded disc material can be removed and/or neural structures can be further decompressed with a variety of rongeurs and grasping forceps .



Rongeur

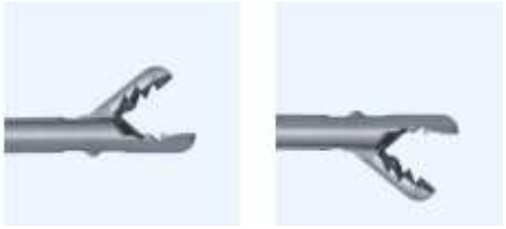


Forceps

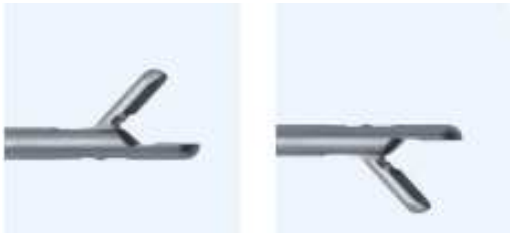
Rongeur
Endoscopic view

Disc decompression

Variation of Instruments all with overload protection.



Cutting and Grasping
in one step



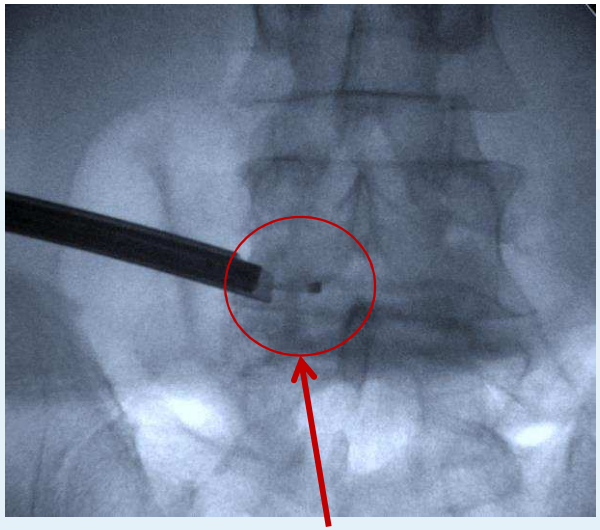
Sharp Rongeurs

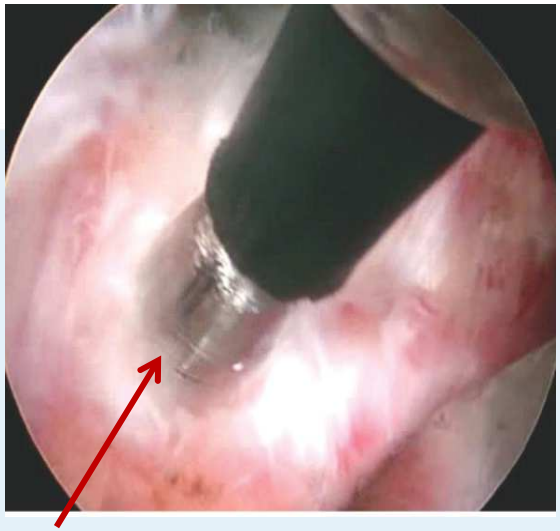
Disc Punch
in side cutting

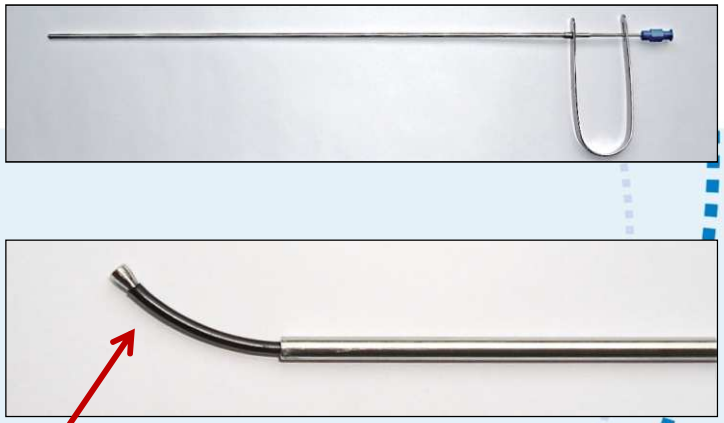
The side cutting concept avoid unwanted injuries special during the access preperation.
Increased control – better outcome.

Disc decompression

In the **final stage** of the procedure, the decompression is assessed with an **articulated palpation-/irrigation-probe** and the neural structures are examined. In addition, this probe is useful for lysis of adhesion and to flush out any far-migrated or scattered disc fragments.





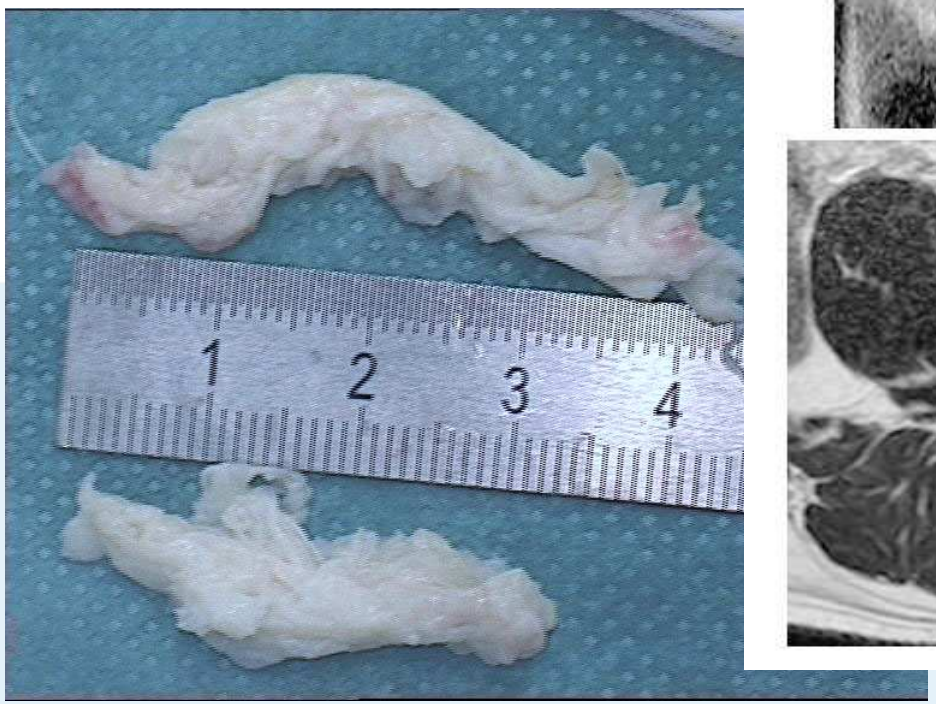


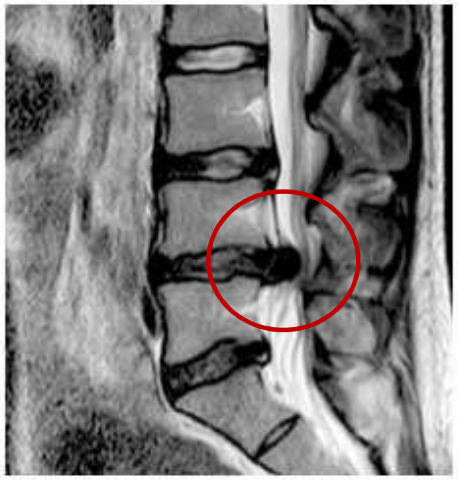
Palpation and Irrigation Probe

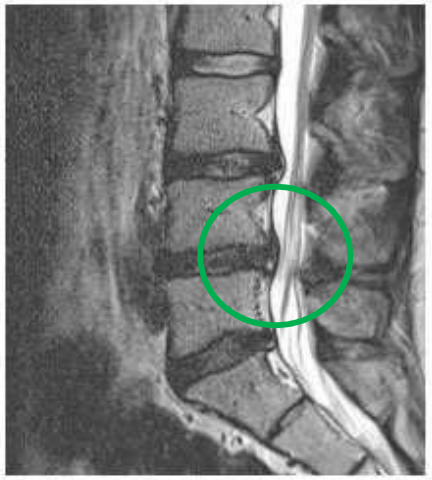
Results

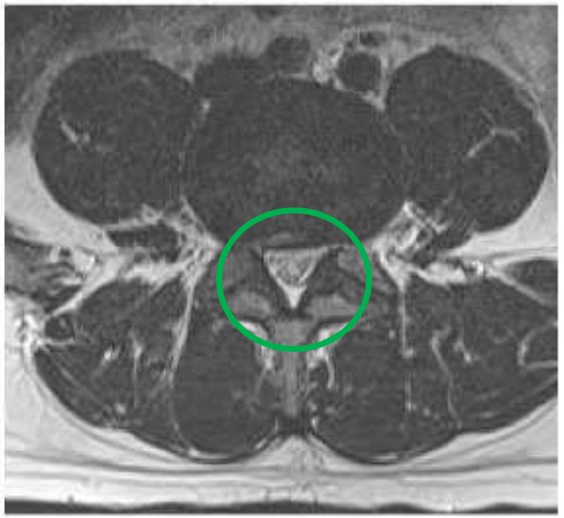
Discmaterial removed

Hugh Fragements









Approaches

Transforaminal decompression – as descriped

also
Interlaminar decompression is with this system possible

Similarly to the micro-surgical technique, the **interlaminary window** is used for a clearly reduced mid-line incision for the access to the vertebral canal. The baholzer system allow a safe and controlled opening of the ligamentum flavum. Once the working sheath is safely placed in the spinal canal with conservation of the neural structures, intervertebral disc material or bony alterations can be withdrawn.

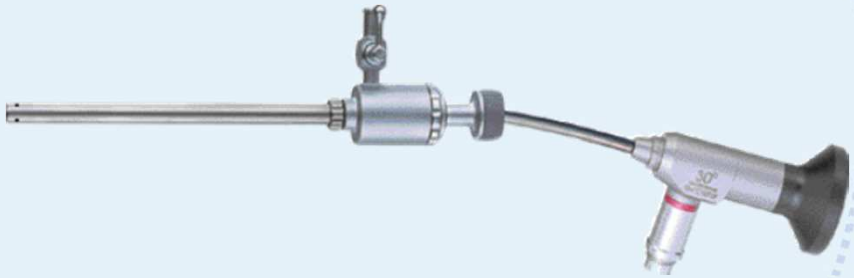
Arthroscopy / full range

Baholzer offers also a full range of innovatiove products in Arthroscopy. Some Highlights:

Variation of Instruments without pin at the jaw

Safety Trocars / protection of endoscope

Shaver blades for all Major Shaver



Flexline Endoscopes – rigid and flexible in one scope