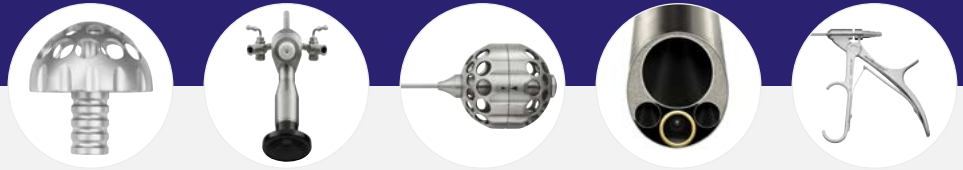
maxmorespine®
BY HOOGLAND SPINE PRODUCTS

LOWER BACK HERNIA SURGERY USING PTED TECHNIQUE

(PERCUTANEOUS TRANSFORAMINAL ENDOSCOPIC DISCECTOMY)

A MINIMALLY INVASIVE **ALTERNATIVE TO TRADITIONAL** HERNIA OPERATION



SUMMARY

In this brochure you can read information about a Hernia lower back operation and a number of guidelines and advice that can contribute to a faster recovery.

PTED Study

In a double-publication, the first results of the PTED-study in The Netherlands were published in the British Medical Journal and the British Journal of Sports Medicine. The effectiveness paper concluded that Full-endoscopic discectomy was non-inferior to open microdiscectomy in reduction of leg pain.

Full-endoscopic discectomy resulted in more favourable results for self-reported leg pain, back pain, functional status, quality of life, and recovery. Full-endoscopic discectomy can be considered as an effective alternative to open microdiscectomy in treating herniated discs. After the study, the Dutch National Health Care Institute proved that a PTED operation for the treatment of a low back herniation is at least as good as common techniques, but it is less stressful for the patient and much cheaper. That is why the Zorginstituut advises the Minister of Medical Care and Sports to reimburse PTED from the health insurance from December 1st 2020.

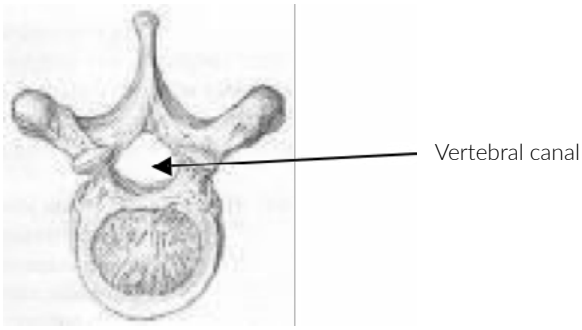
What is a Hernia?

A hernia is a fracture in the intervertebral disc making it soft intervertebral disc material protrudes and can press on the nerve. A nerve cannot withstand pressure or entrapment. When the pressure on a nerve persists, there is a risk of nerve damage. The nerve will then function less well.
A hernia operation via the PTED technique aims to remove the intervertebral disc tissue that presses on the nerve. Below is described how the back works, then what happens during a back operation and finally how to deal with this.

How is the back constructed?

Your back consists of 33 vertebrae.
These vertebrae together form the spine.
The spine is formed by:
- 7 neck vertebrae, the cervical vertebrae;
- 12 thoracic vertebrae, the thoracic vertebrae;
- 5 lumbar vertebrae lumbar vertebrae;
- the sacrum, the sacrum;
- the tailbone, the coccygus.

Each vertebra contains an opening. Since the vertebrae are above each other, these openings form a channel, the vertebral canal. The spinal cord runs through this channel. This spinal cord consists of nerve tissue. A nerve branches out between 2 vertebrae from the spinal cord. This nerve transmits stimuli from the spinal cord to the body and from the body to the spinal cord. The intervertebral disc is between 2 vertebrae.

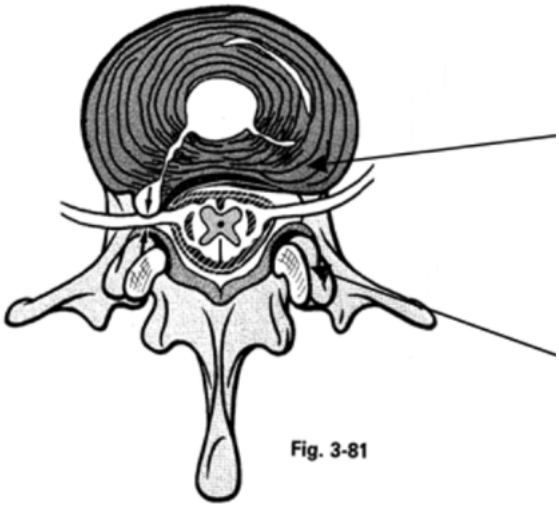


The intervertebral disc

An intervertebral disc consists of a core and rings. The core of the intervertebral disc is a kind of jelly and contains a lot of moisture. The intervertebral disc rings surround this core. These ensure that the soft core cannot break through. The jelly and the moisture contained in the intervertebral disc is soft and elastic, which makes movement of one vertebra relative to the other vertebra possible.
In addition, the intervertebral disc ensures that shocks are absorbed when moving. Between the twentieth year of life and the 50th year of life the intervertebral disc contains relatively much fluid. The spine is then well movable. The amount of moisture diminishes at a later age. The spine then becomes less mobile.

The intervertebral disc is always under pressure. This pressure is greater when the back is vertical, for example when standing and sitting, and less when the back is horizontal, for example when lying. A weak spot can occur in the intervertebral disc rings. This can have all kinds of causes, for example overload, muscle weakness, smoking and / or possibly a hereditary cause.

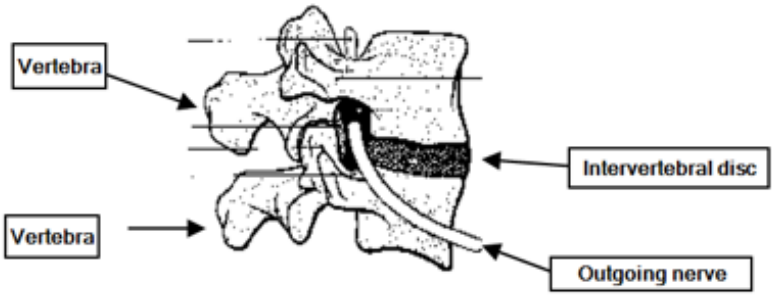
The intervertebral disc is in front of the spinal cord and the emerging nerve.



An intervertebral disc is hardly blooded, with the result that when an intervertebral disc is damaged, recovery is difficult. If a weak spot is present in the intervertebral disc rings, a crack may occur. The core material of the intervertebral disc can then penetrate into that crack. If this crack becomes larger, the core material can protrude outwards. This is a hernia.
This protuberance can pinch a nerve which can cause pain and possibly lead to nerve damage.

Intervertebral disc - space

The so-called intervertebral disc space lies between 2 vertebrae.



The illustration above shows 2 vertebrae between which a white cable runs, the nerve. This nerve branches from the spinal cord to the body. The nerve comes from an opening between 2 vertebrae. It is a fairly large opening for a thin nerve. As a result, the nerve does not immediately get stuck with a possible intervertebral disc narrowing.

Function of the intervertebral disc

One of the most important parts of the back is the intervertebral discs. These ensure:
- that the vertebrae can move relative to each other
- that shocks are absorbed;
- that there is sufficient room for the nerves that emerge between the vertebrae.

The intervertebral disc provides movement

Both the top and bottom of the vertebra are flat. If two vertebrae, without intervertebral disc, were to lie on top of each other, these vertebrae can slide but cannot tilt relative to each other. Because of the intervertebral disc, these vertebrae can tilt with respect to each other. Because of this tilting possibility, the back can tilt for (= bend / flexion) and backwards (= stretch / extension).

The intervertebral disc as a pad

The intervertebral discs have a gel-like core. This core is surrounded by a strong connective tissue ring that is attached to the vertebrae. The gelatinous core is constantly trying to absorb water and will therefore swell. However, this swelling is counteracted by the connective tissue ring and by the adjacent vertebrae. This creates a shock absorber effect. With age, the capacity of the intervertebral discs to absorb water decreases. The connective tissue also becomes less elastic. As a result, the shock absorber function decreases.

The intervertebral disc provides space between 2 vertebrae

Because the intervertebral disc lies between two vertebrae, there is enough room for the nerves to go from the spinal cord to the body.
The bone pieces of two vertebrae, one above the other, form vertebral joints at the rear. Because there is sufficient space between 2 vertebrae, the joint capsule is sufficiently stressed. Because of this there is a normal muscle control for these joints.

What happens during a Hernia operation of the lower back via the PTED technique?

During the hernia operation via the PTED technique, the intervertebral disc tissue, which causes pressure on the nerve, is removed.

What are the consequences of a hernia surgery?

The intervertebral disc tissue that caused the entrapment has been removed. This allows the nerve to recover, reducing pain and recovering from symptoms. Because a hernia has developed at this level, the intervertebral disc is of poorer quality in the future. The hernia operation is only intended to remove the torn piece, the hernia. The problem of the joint itself, the intervertebral disc, is not treated by surgery. This requires first rest and later muscle-strengthening exercises to support this intervertebral disc.

Limit the consequences of a hernia operation

By creating a muscle corset around the operated vertebrae, the load on the lower back is better distributed and absorbed better. This allows you to prevent a new hernia and a new nerve compression. A muscle corset means that the muscles involved are tightened for as long as possible. This requires intensive training.

Why is it important to tense muscles for a long time?

By tightening a muscle for a long time, the muscle becomes tighter. The muscle sensors also become tighter because of this. If there is now a change in tension with this tighter muscle, the muscle sensor will send a signal quickly, resulting in improved muscle control.

Important for recording

You should stop taking some medication before the operation. This applies in particular to anticoagulant medication (blood thinners). For example, if you are using Ascal®, Acetylsalicylic acid Cardio, Marcoumar®, Acenocoumarol, Plavix®, Pradaxa® or Aspirin®, you should temporarily stop taking your medicine.

Being sober before the operation

Before the operation you must be sober from a certain time. The guidelines can be found in the brochure of intervention under anesthesia. You received this during your outpatient visit or during the pre-operative consultation.
You must adhere to these guidelines.

The operation route

The admission and surgery day

For a hernia operation on the back via the PTED technique, you will be hospitalized for one day.
On the day of your operation, you come to the hospital in the morning in a sober manner. You report at floor D, Neurosurgery at the agreed time (see also the folder Guide to floor D, Neurosurgery). Here you will be received by a nurse. At the Neurosurgery nursing hour you are already informed about the admission. The anaesthesiologist has informed you about the state of affairs regarding the anesthetic. Depending on your age and health, blood has been taken from you and an ECG (electrocardiogram) has been made. This is a recording of the heartbeat to get an impression of the rhythm of the heart. Any additions will be discussed in the interview.
Shortly before you go to the operating room, you will be asked to put on an operating shirt. The nurse gives you a medicine to prepare you for the anesthetic. The nurse will then give you an injection at the navel, this is intended to prevent thrombosis (blood clots). You will then be taken to the operating room. There you will meet the anaesthesiologist. You will receive an infusion in the operating room and the anesthetic is administered through this infusion.

The operation

The surgery is done through a small opening in the side of the body, after which the neurosurgeon drills a channel up to the vertebra. A sleeve is slid through this channel through which the neurosurgeon can see the hernia with a camera and can remove it. In this way the nerve becomes free and the leg pain diminishes. With the PTED surgical technique, only the protrusion of the intervertebral disc, that is the hernia, is removed. The intervertebral disc itself is not operated. After this, the wound is closed with a soluble suture and / or some plasters.

After the operation

After the operation you will be taken to the recovery room. As soon as your condition permits, you go back to the nursing ward with the permission of the anaesthesiologist.
You lie on your back for a few hours. The nurse regularly checks your pulse, blood pressure and the function of your legs.

If two hours have passed, you may get up out of bed under supervision.
Your back is strong enough for this, so you don't have to worry. You must try to urinate in the ward within four hours of your return. If this does not happen spontaneously, your bladder will be emptied by means of a tube. If you cannot pee before 9 p.m. in the evening, you will stay one night in the hospital and you may go home the next day after you have watered. The physiotherapist will visit you during your stay in the ward. He / she explains exercises that help to restore your back and that are not burdensome.

Leg pain

After the operation you will feel wound pain near the scar, for which you will be given analgesic medication. More information can be found in the Pain measurement brochure.
The wound from the operation can remain sensitive for a few days to weeks. For some people this takes longer.
You may feel residual pains in the leg in the first few months after the operation. This pain can change every day and is usually caused by irritation of the nerve, as mentioned below. It may happen that the pain only occurs after a few weeks due to cramps in muscle groups in the area of the buttock or in the leg itself.
These muscle cramps can usually be remedied by intensively massaging the painful area for several weeks.

Swelling

The nerve may swell the first three to five days after surgery due to irritation during surgery. This can cause pain, deaf feelings or tingling, which gradually diminishes after a week.
Sometimes a swelling of the wound occurs. This is usually caused by the soluble sutures under the skin or some wound fluid. This swelling disappears after about two to three months.

The recovery

Before the dismissal

If everything goes well, you can go home.
Before you go home, you have a conversation with the nurse. He / she makes a check-up appointment (date approximately six to eight weeks after the operation) at the neurosurgeon at the outpatient clinic. You will also receive care instructions. The letter of resignation for the doctor is sent to your doctor. **You are definitely not allowed to drive yourself.**

The wound

- 48 hours after the operation there is no need for a patch on the wound, provided it is dry. Change the patch daily in case of leakage. Remove the patch before showering and then stick a new one. Plasters are available at the pharmacy.
- The wound may get wet in the shower, but do not bathe for at least 2 weeks.
- The wound is usually sutured with soluble sutures. If this is not the case, you have been given an appointment at our outpatient clinic to remove the stitches. It may happen that the knots of the soluble stitches are still visible after 10 days (the knots do not dissolve because they are outside the skin). You can remove it yourself or if you dare not, ask the doctor to do this for you.
- For the wound to heal as well as possible, it is important not to add any external heat to the wound during the first 3 weeks.

Physiotherapy treatment program

Create a muscle corset

By creating a muscle corset, it is prevented that the upper vertebra is moved relative to the lower vertebra, of the intervertebral disc where the operation took place.
To create a muscle corset you need your **pelvic floor muscles**, your **low**, **small back muscles** and the **tighten deep**, **transverse abdominal muscles** at the same time.

Pelvic floor muscles

The pelvic floor muscles are the muscles that run between your pubis and your tailbone. By slightly retracting your pelvic floor, you tighten these muscles. Prevent pelvic tilting. Women tighten these muscles when they try to hold their pee. Men tighten these muscles when they raise their scrotum.

Low back muscles

The low, small back muscles lie at the rear of the spine and run from vertebra to vertebra. By making your lower back slightly hollow, you tighten these muscles.

Abdominal muscles

The deep, transverse abdominal muscles lie at the front of the lower abdomen and extend from the left pelvis bone to the right pelvis bone. By slightly retracting your navel you tighten these muscles.
Pay attention: Prevent pelvic tilt from taking place in the said muscle groups! By contracting the pelvic floor muscles, the low small back muscles and the deep transverse abdominal muscles at the same time, the muscle corset is formed. This compensates for the reduced muscle control in the area where the operation took place. It is prevented that the intervertebral disc where the operation took place is overloaded.

It is important to know that the position of the lower back should not be too concave or too convex. It is important to choose the position of the back so that the possible appearance in the leg is reduced. This means that you need to tighten these muscles slightly while sitting, walking, standing, etc.

Exercises

Chair

With a chair you can experience the tightening of the mentioned muscles. You perform the exercise in the following way:

- You are sitting in a chair. A chair is within reach for you with the backrest facing you:
- You are now sitting upright on the rear seat and with the pelvic floor muscles, the lower back muscles and the transverse abs slightly tightened.
- You are now grasping the back of the chair in front of you with both hands. You continue to tighten the muscles involved.
- While remaining seated, pretend to push the seat forward and then pull it back slightly. Ensure that the seat does not move.
- Now try to alternate the pulling and pushing movements while remaining stable.

• Then act as if you are shifting the seat to the left and to the right. Ensure that the seat does not move.
• You can also push with one hand and pull with the other hand, then change.

By constantly varying all directions of movement, you train the muscles involved and you are busy creating a muscle corset with your muscles.
It is recommended that you do this exercise several times a day, with the aim that you tighten these muscles continuously and naturally.

Physiotherapy

There is no immediate need for physiotherapy after surgery. Certainly not in the first 4-6 weeks. We recommend that you await the natural recovery and, above all, practice good stabilization of the lower back and apply it in daily life. During the checkup at the neurosurgeon you can discuss whether physiotherapy is still needed.

Possible problems

There is a risk of possible problems with every surgical procedure. Your treating doctor has already discussed potential problems with you. If you have any questions about this, you can always ask your doctor.

Deaf feeling or loss of strength

A deaf feeling or loss of strength is usually because the nerve has become irritated during the operation and therefore has become somewhat swollen. The irritation is caused because during the operation the nerve must be kept aside because the hernia is removed alongside it. The deaf feeling and loss of strength usually go away automatically in the weeks to months after the operation. Occasionally it takes a year. In 1% of the patients, there is ultimately no recovery.

A deaf feeling or loss of strength, which already existed before the operation, usually shows a less good or even no recovery. It also often takes much longer before a possible recovery is noticed.
Feeling deaf can be unpleasant, but it does not affect the functioning of the leg.

After bleeding

After bleeding is very rare. It can manifest itself because the wound becomes very thick and painful in one of the first days after surgery, or because the wound continues to leak blood or bloody fluid for a long time. Occasionally, pressure may occur on the nerves as a result of after bleeding. This allows you to experience pain, tingling, numbness and / or loss of leg strength.

Wound problems

There may be wound problems in various places.
• **Infection of the wound**
This may be the case if the scar does not heal properly or yellowish fluid or pus always comes out of the wound.
• **Infection of the intervertebral space and / or vertebra**
This is very rare and, if it occurs, causes a lot of trouble in the back and / or the abdomen.
• **Release wound edges**
If the wound edges release a little bit, this will not hurt and it will simply close again. Releasing wound edges can indicate a starting infection. If the wound edges release over more than 1 centimeter, they should be looked at, at least during the Neurosurgery nursing hours.

• Leakage of brain fluid

Leaking brain fluid rarely occurs. It happens when someone has had surgery on a hernia in the same place before. It can occur because the membrane around the nerve (s), which is sometimes very thin, is slightly damaged as a result of the release of the nerve. This can cause fluid that leaks around the brain, spinal cord and nerves. This is usually only a very small amount. If possible, the damage is attached, otherwise it is sealed in a different way.

Usually the hole is so small that it does not bother you, but sometimes it can give you (a little) headache. If a lot of fluid has drained away, you will be advised to drink approximately 1 liter of fluid extra per day and to stay in bed for a few days.

Instability of the vertebrae

After a hernia operation, there may be a slight play between the vertebrae or the height of the space between the vertebrae may decrease to such an extent that the back or leg is again troubled.

Formation of scar tissue around the nerve

There are many misconceptions about this. Scar tissue occurs with every operation and it usually does not cause any problems. Nowadays scar tissue can be made visible during MRI examinations, as a result of which a misunderstood burden is quickly wrongly attributed to this.

Scar tissue can cause problems. Because the nerve is less mobile due to the scar tissue, it may be the reason for a slower recovery in some patients. This is noticeable because the nerve pain subsides less quickly and sometimes even increases after certain activities (for example, long sitting) or after a long walk. This usually improves after a few months.

Increase burden on back and/or legame back and/or leg

Increased pressure on the joints between the vertebrae

This often causes more back pain during the first 3 to 6 months, or even a back tilt. This will pass again in the same period. The reason for the increase in the burden is that the joints at the back of the vertebra can tolerate more pressure, because tissue has disappeared from the intervertebral space

New hernia (at the same or a different level)

The chance of this is less than with a conventional hernia operation. This is not yet known with the PTED technique.

Problems with the ligaments and joints between the back, the area of the hips and the coccyx

If these tires get a little too stretched or irritated, it often gives pain, stiffness and hard muscles. This is felt slightly near the middle of the back or in the buttocks area. At the same place where sometimes a “cramped muscle node” can be. The physiotherapist can treat this with massage.

When should you contact?

If you have any of the following symptoms, you should contact as soon as possible:
- unsustainable pain in the back or leg;
- abnormal swelling of the wound;
- open wound;
- pus from the wound;
- high fever;
- increasing loss of strength on one or both legs;
- symptoms of incontinence (letting the pool or faeces run unnoticed without your having influenced it);
- or if you or your physical therapist do not trust it.

Advice for the home

General

The recovery after a hernia operation can be different for each patient.
Below are some guidelines for building activities such as walking, sitting, stooping and lifting. By doing these activities you promote recovery.
It is possible that you will get back pain during the activities. This is probably due to the more intensive tensioning of the back muscles that sit between the vertebrae. This back pain is therefore an “acceptable” pain. By doing the activities you promote your recovery.

To walk

The first days after your surgery it is good to lie down regularly. It is important that you reduce the duration and frequency of lying down.
In this period it is better to walk instead of to sit. Regularly walk short distances and build it up in time and distance.
When walking, make sure you create the so-called muscle corset and therefore tighten your muscles.

To sit

When you sit down, it is difficult to keep the muscles in tension. That is why it is not advisable to sit down a lot during the first few days.
If you sit down, do this for a maximum of 15 minutes and try to tighten the muscles of the muscle corset. Sit well upright on a chair with backrest, not slumped on a couch. Make sure your feet rest well on the floor. Use a footrest if necessary.

To lie

Make sure you do not sleep on a bed that sinks. You can optionally have planks or a chipboard installed under the mattress.

Housework

You can resume a few days after your operation to do light household tasks, such as washing dishes, making coffee, setting the table and so on. When performing these activities you must keep the muscles of the muscle corset tight.

Stooping and lifting

Bending over is a heavy burden on the back.
Avoid this movement by squatting with a straight back to pick up something off the ground. This also applies to lifting. We do not recommend lifting during the first two weeks after your operation. Lifting is always an extra burden on the back and therefore it is better to avoid lifting as far as possible. Use tools wherever possible. If it cannot be otherwise, lift with a straight back and start with light loads.
If this goes well, you can gradually lift more, but keep the above in mind. It is very important that you keep the muscles of the muscle corset tight during lifting and squatting.

Resuming your work

Light work (working at a desk) can be resumed after two to four weeks (the first 1-2 weeks start with half days or a few hours a day), provided you pay close attention to stooping and lifting. The heavier work (work that requires a lot of lifting) may be resumed after 3 months. This possibly in consultation with your treating physician.

Sex

Sexual intercourse is not a problem, as long as you treat your back wisely.

Cycling

You can cycle again after approximately 2 weeks. You should preferably go cycling on an asphalt road, using your muscle corset. Build this up quietly, in distance and time.

Driving a car

If the strength of the leg and foot muscles is normal after the first 2 weeks of your operation, you can drive yourself.

To swim

If the surgical wound is healed, you can start swimming after 3 weeks. You start swimming on your back, the following times you can also swim on your stomach. Again, it is important to use your muscle corset.

If you have completed all of the activities mentioned above, without complaints, you can expand the household activities.

Finally

If you still have questions after reading this brochure, you can ask the attending physician or the nurse in the ward.

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