



NATIONAL CENTER FOR SPINAL DISORDERS



VENTRAL (ANTERIOR) STABILIZATION OF THE LUMBAR SPINE

SURGERY: VENTRAL (ANTERIOR) STABILIZATION OF THE LUMBAR SPINE (Fusion, Fixation)

Your diagnostic tests as well as the physical examinations have shown that you are suffering from spinal instability. Your doctor has described to you the treatment possibilities.

Before you undergo surgery, it is important that you familiarize yourself with your illness, the surgical procedure and what you, yourself, may do in order to help decrease your pain. It is important for us, that we provide you with enough information so that, when we ask for your consent to surgery at the end of this document, you will be able to make your decision responsibly. Please read this material carefully and consult with your treating doctor should you have any questions.

WHAT IS SPINAL INSTABILITY?

The spinal column protects the spinal cord and the nerves from injury. The spinal cord is found within the spinal canal that is bordered in front by vertebrae and intervertebral discs and in the back by the vertebral arches and intermediary ligaments. Aside from the protective function, this structure makes orderly movement of each segment vis à vis each other (movement segments) possible while, at the same time, providing internal support. Injury to any one of these segments, usually in combination, will cause the movements of the spine to become disharmonic resulting in instability.

Possible causes of instability:

- Acute - trauma
- Chronic - degeneration of the spinal column
 - abnormal development
 - tumors
 - condition following surgery
 - inflammation

Segmental instability may result in the narrowing of the spinal canal causing the nerve components to be compressed. Increased muscle function may develop as protection against this process with osteophytes (bony outgrowths) developing later in an attempt to stabilize the damaged joints.

The majority of these cases run their course without symptoms requiring treatment only in the case of complaints.

WHAT ARE THE SYMPTOMS OF INSTABILITY

- Pain increasing at weight bearing:
 - zonal pain radiating from the waist down along the posterior-lateral surface of an extremity into the buttocks, thigh and knee possibly originating in the structural elements of the spine,
 - pain below the knee, in the groin or running along the anterior-interior surface of an extremity accompanied by numbness, may be due to nerve compression.
- Restricted movement of a spine segment.
- Lower extremity sensory disturbance or insensibility.
- Weakened or paralysis of lower extremity muscles or muscle groups.
- Abnormal vegetative system, that is, abnormal bowel, urinary or sexual function.
- Antalgic posture.
- Limp.

WHAT TREATMENTS ARE AVAILABLE?

Basically, there are two treatment possibilities:

1. Non-surgical (conservative) treatment
2. Surgical treatment

1. Non Surgical (Conservative) Treatment:

Conservative treatment is the treatment of choice in cases where there is either no or only slight nerve damage

Goal:

- To re-establish spine stability and develop the corset muscles.
- Reduce fortuitous nerve inflammation and thereby,
 - increase walking distance,
 - decrease pain, and,
 - increase muscle strength.

Methods:

- Initially, bed rest (3-4 days).
- Medication, other physiotherapy and alternative treatment methods.

The most effective conservative treatment method is the series of antiphlogistic intravenous infusions in conjunction with physiotherapy.

In the longterm:

- Life style changes: decrease/stop alcohol intake and smoking, change dietary habits, lose weight, reduce stress, etc.
- Sleep and other related psychosomatic disorders should be treated (i.e., chronic gynecological and cardiovascular diseases, as soon as possible).
- Restore physical and emotional state.
- Increase activities: regular exercise, followed by, physical training.

If, in spite of conservative treatment, there is no improvement or neurological symptoms, such as lower extremity paralysis appear, then surgery is necessary to free the nerve from the excessive compression and stabilize the spine segment.

2. Surgical Treatment:

Surgery's goal is to stabilize the unstable spine segment and correct possible nerve compression and end the source of pain.

The intervertebral disc is removed in its entirety during the anterior approach while, at the same time, solving to some degree, anterior narrowing of the spine canal. A block vertebra is then formed with the help of a support, bone and metal implant placed in the cartilage space.

BEFORE SURGERY

1. Preparing for hospitalization:

Check for any focus (hidden infection site), i.e., purulent tonsils, urinary tract infections, gynecological infections, etc. Their treatment is very important since an infection may cause pathogenic agents to travel to the surgical site through the blood stream causing wound infection.

General medical preparation – when required.

Anesthesiological examination with laboratory, x-ray, ECG and ultrasound results.

The Patient may require blood substitution or transfusion during lumbar stabilization surgery or immediately thereafter. Autotransfusion is desirable, if your doctor is in agreement. Please ask your doctor regarding special informational material available regarding blood substitution.

2. Reminders (definitely consult with your doctor)!

- Non-emergency surgery may be performed only after 3-6 weeks following upper respiratory inflammation, urinary tract infection or other infections.
- Anticoagulants should not be taken for a few days before the planned surgery. Syncumar, Warfarin and Clopidogrel must be stopped for 10 days and ASA, Aspirin protect, etc. medications stopped for 5-6 days, or rather, substituted by Heparin derivative injections.

3. Inhospital Preparation

- The afternoon prior to surgery, you will be given an anti-thrombotic injection and sedatives the night before.
- The day of surgery:
 - disinfectant bath,
 - removal of dentures,
 - removal of nail polish,
 - anti-embolism support stockings or bandages applied,
 - regular medications taken with one swallow of water as discussed with the anaesthesiologist beforehand,
 - presurgery injection (premedication)
 - infusion begun – as indicated by doctor

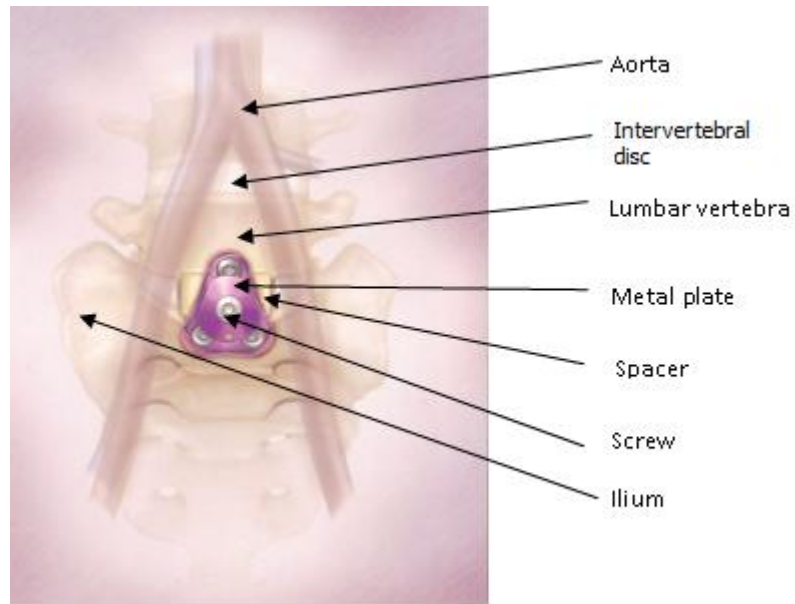
- **Do not drink anything besides the liquid needed for your medications, do not eat and do not smoke!**

WHAT HAPPENS IN THE OPERATING ROOM?

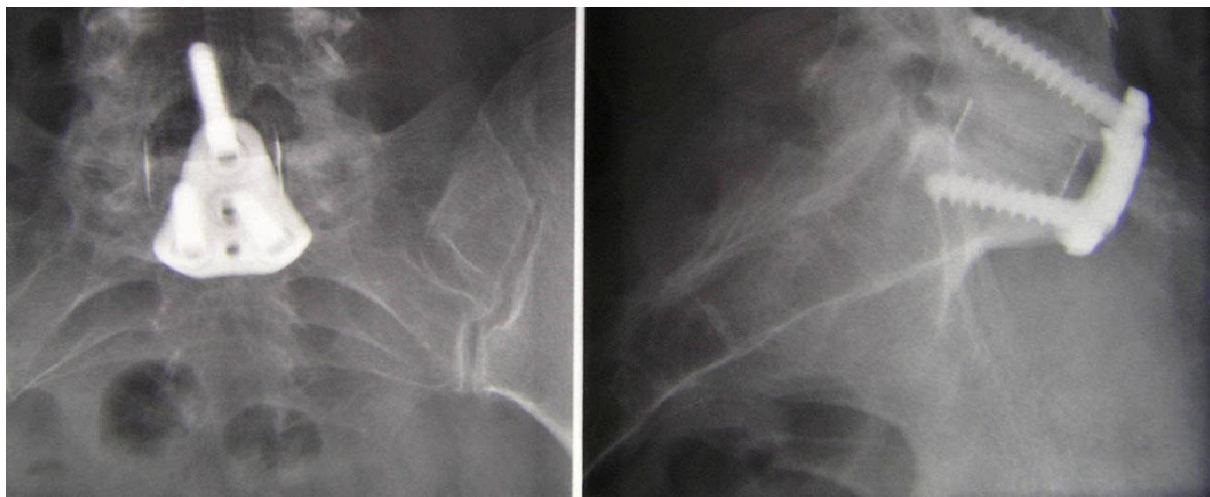
- The surgery is usually performed under anaesthesia. The anaesthesiologist will inform you regarding the particulars of the anaesthesia and ask you to sign a consent form.
- You will be lying on your back on the operating table.
- The surgical area may be shaved, if needed.
- The surgical area and the surrounding skin will be washed with a disinfectant several times.
- You will be covered with a sterile sheet with only the surgical area exposed (isolation).

THE SURGICAL PROCEDURE:

- An incision is made on the stomach corresponding to the area of the diseased spine segment.
- After the skin and the tissues below are opened, haemostasis (the control of bleeding) follows.
- Then, carefully separating the layers found in the physiologic space between the musculature of the stomach wall and the peritoneum, we arrive at the anterior surface of the spine segment involved.
- The worn down and no longer useful intervertebral discs are removed and replaced with titanium or ceramic spacers around which spongy bone fragments, gained from the hip bone (ilium) through a small skin incision, are compressed.
- The area is immobilized with titanium screws and a rod led into the vertebrae, or in combination with plates.
- One or two drains are placed in the wound to remove effused blood.
- The wound is closed in several layers, covered with a sterile bandage and an x-ray is taken while you are still on the operating table.



Stabilization of lumbar spine vertebrae through the anterior approach



WHAT HAPPENS AFTER SURGERY?

- You will stay in the operating room for a time after surgery for observation
- Depending on your condition, you will be taken either to the observation room or the ICU.
- The anaesthesia will gradually wear off in a few hours, whereupon, you will be given an injection or pills to lessen your pain.
- It is important that you begin, in spite of pain, breathing and vascular exercises as well as physical exercise routines soon after with the help of a physiotherapist.
- Anti-thrombotic injections are routinely given.
- It is important that you drink plenty of fluids such as fruit juice, tea, soup and non-carbonated mineral water.
- You will be able to get out of bed the day after surgery with the physiotherapist's assistance.

- It is important that you heed your physiotherapist!
- The drain is removed from the wound 1-2 days after surgery.
- You may be discharged in 5-7 days after surgery, if no problems arise.
- At discharge:
 1. You will be given your Hospital Discharge Summary papers.
 2. Please consult your treating doctor for any questions!
- You must strictly keep the wound away from water.
- Suture removal should be 12-14 days after surgery, but not necessarily at this institution.
- The date of your first checkup (4-6 weeks post op) will be found in your Hospital Discharge Summary papers.
- Rehabilitation – as discussed with the treating doctor and under the care of specialists.
- We do not plan to remove the titanium implant.

WHAT HAPPENS IN THE EVENT THE SURGERY IS CANCELLED?

- The nerve root may be permanently damaged, due to the lengthy compression time.
- The pain in the spine and the lower extremities may increase further.
- The limitations on your movements may become more serious.
- The quality of your life may continue to deteriorate.
- Surgery performed at a later date may be technically more difficult with the likelihood of success diminished.

POSSIBLE SURGICAL COMPLICATIONS

1. Possible unforeseen complications of surgery

- The membranous sac that encases the spinal cord, the dural sac, may tear. In certain situations during surgery, the dural sac may open causing the liquid (the cerebrospinal fluid) contained within to freely flow out. The membrane is immediately closed with sutures and adhesives. Healing of the membrane occurs in 3-5 days, during which time, in order to keep the pressure of the liquid low, you will be required to lie flat on your back and will not be allowed to get out of bed.
- Although this happens seldom, the nerve root may be damaged. This is, generally, due to circulatory/mechanical damage resulting from the forced tight conditions of nerve root decompression. This may be temporary or permanent and may influence nerve root function partly or completely. Symptoms: sensory disturbance, muscle weakness in the affected areas.
- One of the advantages of the anterior approach is that the spine may be reached through the physiologic space with the least tissue having to be cut through thus avoiding bleeding from small veins and damaging the musculature supporting the spine. On the other hand, two of our body's largest blood vessels, the aorta and vein are located on the anterior surface. Thankfully, these that may cause serious bleeding, are damaged very seldom.

- A nerve bundle (the sympathetic chain ganglia) is found along the anterior surface of the spine that is responsible for regulating the blood vessels of the lower extremities, the skin's temperature and other similar functions of the vegetative system. This nerve bundle is not responsible for the skin's sensory state nor of the muscle function of the extremities. Traction of the nerve upward from the IVth lumbar vertebra may cause widening of the lower extremity arteries possibly resulting in the warming of the extremity. (This nerve bundle is regularly cut through in patients suffering from vasoconstriction to increase blood flow to the extremities: sympathectomy.) Traction of the nerve at the L.V vertebra level in men may lead to retrograde ejaculation, in effect resulting in sterility, since the semen is redirected to the urinary bladder, but not impotency, since it does not affect erection.

2. Possible early complications, 1-2 days following surgery

- Post surgical pain in the legs or muscle weakness. This is due to oedema and swelling of the nerve. IV infusion, physiotherapy and electrotherapy treatments may be required.
- Urination difficulties might temporarily require catheterizing and the bladder may require treatment (exercise, medication).

3. Complications that might arise 3-4 days following surgery

- Suppurative wound. Bacteria living in our system but not causing diseases may settle in the fresh surgical wound causing its suppuration. This process has typical symptoms:
 - a. Wound inflammation: erythema, swelling, pain, warm to touch, discharge
 - b. General symptoms: fever, despondency, general indisposition

The suppurative wound can usually be treated with antibiotics and local cooling treatment; however, surgery may be necessary at times in order to clean the wound and put a drain in place. The drain will continue the cleaning process for 5-6 days during which time, depending on the condition of the Patient, mobilization may be started.

4. Possible future complications

- Thrombosis – inflammation of lower extremity varicose veins.
- Pulmonary embolism – blockage of artery in the lungs.
- Functional disorder of the bladder and rectal muscles.
- Accelerated degeneration of neighboring levels.
- Displacement of the implant and, in case of metals, breakage (i.e., screws, plates). X-rays and CT scans prepared during the follow-up examination help us observe the condition of the operated spine segment. When the purpose of the surgery is to bring about stabilization, the implants or cages have a role to play only until bone remodeling has occurred. Once bone remodeling and vertebral fusion have taken place, they are no longer needed. Bone remodeling will, generally, occur even if the implants move or are broken due to metal fatigue. We often find broken screws with no symptoms or complaints. The implants or foreign objects are removed only when

bone remodeling or vertebral fusion has not taken place (false joint developed) and causing the Patient complaints.

We have found, though seldom, screws and rods broken several years after surgery especially in cases where several segments required long bridging and fusion.

REHABILITATION FOLLOWING SURGERY

The spine segment involved cannot be considered healed immediately following surgery. Thus, in order to protect the spine and help the healing process, it is very important that you listen to and follow the advice of the professionals leading the rehabilitation.

The six weeks following surgery is the first regeneration phase. This is a seemingly slow, but active time during which you need to endeavor to develop a new life style.

In order for a new action or behavior to become permanent or habitual, it has to be repeated regularly for an entire month. This holds true when attempting to change a lifestyle.

THE IMPORTANCE OF REGULAR EXERCISE

The spine requires special attention and care following successful surgery. As the result of surgery, the spine segment involved changes in structure, increasing the load on the neighboring spine segments. It is extremely important that the functional capacity of the operated spine segment be restored and the neighboring areas protected through special kinesitherapy. In order to avoid overloading the spine, correct posture change and workflow should be taught within the context of ergonomics as well as preparing the body for sports.

The healing period following surgery may be divided into several phases. In addition to the required medical care, for the spine to be completely restored, various movement programs are necessary together with ergonomic consultation. This is where physiotherapy can provide excellent care.

Phase 1. First 6 weeks after surgery

Targeted kinesitherapy and ergonomic life style consultation is started the day following surgery, as allowed by the Patient's condition.

The goal of the kinesitherapy is to regain, as soon as possible, the body functions necessary for self-sufficiency (turning in bed, sitting up, sitting, standing up, walking, etc.), to unburden and avoid unnecessary weight bearing on the operated spine segment as well as pain free posture and gait.

Ergonomic consultation includes practicing the series of movements required for basic self-sufficiency while maintaining the physiologic curvature of the spine as well as determining precisely the extent to which the spine can be or should be loaded (the amount of time spent sitting, standing, walking, how much weight may be carried, etc.) during this phase.

You should avoid extreme movements of the spine that include forward bending, trunk twisting or sideways bending even while turning, sitting or standing up from bed.

Long periods of static sitting or standing should be avoided. Even individuals with hardened musculature will feel its tiring effects after 15 minutes and resulting in a stooped posture.

Walking, light work and physiotherapy may be increased a little every day.

Rest and activities should be a little but often.

Phase 2. The second 6 weeks after surgery (second stage of tissue healing)

The goal of the early rehabilitation phase is to return you to your everyday activities, to restore the functions and the reduced functional capacity (range of movement, strength, endurance) of the operated spine segment.

Within the framework of ergonomics, we will practice the daily used movement patterns (both at home and at work) while protecting the spine and, furthermore, will determine the spine's loading capacity.

Longer and longer walks and hikes on a variety of terrains.

Swimming and underwater exercise recommended.

Static loading (sitting, lolling about) may be increased until there is no pain.

The prevalent stooped posture will be replaced with other body postures (kneeling, squatting, down on all fours).

Phase 3. Three months after surgery.

The goal of the later rehabilitation phase is to establish realistic personal goals and create safe daily and sports activities.

The targeted movement program will help develop the trunk musculature and re-establish muscle balance to actively support and protect the spine from possible overloading.

Sports preparedness (sports specificity) will play a significant role in ergonomic consultation along with protection of the spine.

We offer six-week and three-month post-op outpatient group physiotherapy (max. 5 persons) sessions covered by public health insurance. Individual condition evaluation precedes the physiotherapy in all cases. The evaluation is by appointment which you may request by calling our dispatchers at (1) 887-7900. Following the evaluation, the physiotherapist will, based on professional aspects, decide which personal movement program to recommend and personally help you register for the group physiotherapy sessions. Doctor's referral is required for both the condition evaluation and the group physiotherapy. Should you prefer individual physiotherapy sessions, these are available privately. For details, please turn to the dispatchers.

Please bring your own ambulatory aids (walkers, elbow crutches, etc.) at the time of admission.

WHEN IS SURGERY CONSIDERED A SUCCESS?

Surgery is considered a success when your condition and your quality of life following surgery improved.

It is important to remember that this is a process – a process that slows down at times because the “nerve is slow to forget”.

Unfortunately, a successful surgery does not stop the aging process nor does it solve the problems and tensions affecting body and soul resulting from your life style and outside stresses. Thus, it is important that you work toward a healthy life style, exercise, avoid

loading the spine improperly and stabilize your spine through activities that decrease tension (i.e., relaxation, yoga, etc.) and lower the risk of a new herniated disc.



Thank you for choosing us!

CONSENT TO SURGERY

**DISORDER: LUMBAR SEGMENT INSTABILITY OF THE SPINAL COLUMN
(INSTABILITY, STENOSIS)**

**SURGERY: VENTRAL (ANTERIOR) STABILIZATION OF THE LUMBAR SPINE
(FUSION, FIXATION)**

- I have carefully read the detailed information given to me by my treating doctor both verbally and in written form.
- I was informed regarding my disorder and the reason for my resulting complaints as well as the course my disorder might follow should I not choose surgery. Thus, I understand that, according to today's best medical knowledge, permanent improvement of my condition can only be attained through surgery. My questions regarding the surgery were answered extensively.
- I was informed regarding the advantages and possible disadvantages of surgery.
- I was given to understand the meaning of surgical risk.
- I was informed in detail regarding possible complications, their probability, nature and treatment as well as the temporary or enduring but seldom terminal condition deterioration as the result of surgery.
- I understand that I might have to wear an exterior fixation device for three months following surgery.
- I consent to a blood transfusion should it become necessary during the course of surgery.
- I was informed regarding postoperative treatments.
- The anaesthesiologist has informed me regarding the anaesthesia for which I give my consent separately.
- Having carefully considered all of the above facts and in order to treat my disorder, I request that the surgeon chosen by the Head of the Department perform the surgery to which I have given my consent.
- I have no further questions regarding the surgery.
- Having read the foregoing, I, the undersigned, being of sound of mind do, hereby, sign this Consent of my own free will and volition in the presence of two witnesses.

Budapest,

.....

Surgeon

.....

Patient or Legal Guardian

Witness (Name, Address):

.....

Witness (Name, Address):

.....

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