



## MICRO INVASIVE BIOLOGIC REGENERATIVE AUTOGENOUS RECONSTRUCTION (MIBRAR)

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**Abstract** *Interventional MIBRAR system, developed by me is a complex of high-grade micro invasive surgical technics, aimed at the regeneration of the tissues and reconstruction of the body structures. Here are Fundamental concepts and definitions of that*

**Keywords:** *epiduroscopy, endoscopy, regeneration, reconstruction, micro invasive, minimally invasive, neurosurgery, trauma surgery, orthopedic surgery, MIBRAR method*

### **Introduction**

In MIBRAR method exclusively autologous substances are used, that activates regenerative process and provides full reconstruction of damaged body tissues. Method is implemented because of unique surgical technologies, and with surgical instruments, developed by me, with following application of patient's own components such as stem cells, growth factors and other autologous substances. Thanks to many years of research and practical activities of me, this method gained international recognition and became revolutionary in modern medicine. For the activation of the regenerative process, autologous plasma is applied to the damaged tissues that are enriched by growth factors, anti-inflammatory factors and mesenchymal stem cells lipogems and separated stem cells, taken from the subcutaneous fat tissue.

### ***Meaning of MIBRAR***

Surgical technologies by MIBRAR method cover about 95% the range of all diagnostic and therapeutic events in neurosurgery, orthopedics and traumatology. This allows avoiding such extensive interventions as end prosthesis or use of synthetic medication.

*MIBRAR* is a micro-invasive intervention, mainly applied in regenerative medicine and promotes morphologic regeneration and macroscopic reconstruction of tissues and body structures. According to my research, surgical interventions, contributing to the effective regeneration and body structure reconstruction have to be maximally sparing, i.e. performed by micro invasive method.

International researches show that human autologous substances leading to the regeneration process (growth factors and mesenchymal stem cells), by their nature strive to where they needed the most. This type of reaction appears mainly during serious tissue damage, for example, during surgical incisions or traumatization of healthy tissues during surgery.

Recovery of damaged tissues demands big amount of regenerative factors. It leads to the fact that significant part of regenerative effect of the concentrate directed not to the initial problem, but effectiveness of regenerative medicine is significantly reducing during treatment of damaged parts.

Even the most little incision demands long, often many weeks of recovery process, that always activated by stem cells. Little puncture, that is done with the micro dimensional instrument, only stretches the tissues. After the surgery patient has insignificant damage of surrounding tissues, that recovering during a few hours or days.

Therefore the MIBRAR method based on the principal of minimal damage of healthy tissues during surgical entrance or during the main part of the surgery. That is why stem cells and growth factors provide maximum effect on initial problem. Big role in recovery process plays the fact that applied autologous substances get to the damaged area by micro invasive way, with minimal tissue damage, and not through surgical incision, causing additional damage of healthy tissues. In order to increase surgical effect, purposefully adding some damage with special technic to activate regenerative reaction of mesenchymal stem cells and concentrate their effect on damaged organ.

*General procedure for conducting intervention of MIBRAR* is that access to the surgical surface happens through minimal puncture, without incision. Use of micro dimensional instruments, special navigational and optic equipment with high allowance (for example, micro-endoscope, micro-epiduroscope, micro-arthroscope, etc.) during micro invasive diagnostic or therapeutic events, provides optic control and minimal load on patient's organism.

### ***Personal development of surgical equipment and instruments***

In order to provide maximal control, accuracy and micro invasiveness during interventional method of MIBRAR, I have developed:

- system of surgical planning
- navigational equipment ( KNK system, Cyber Navi hand, grids)
- special surgical device (Sono Control Arm)
- unique micro dimensional endo- and arthroscope, also
- micro dimensional instruments.

This type of equipment corresponds to the highest international technical standards.

Surgical planning system (Cyber Navi Hand) provides necessary visual control during the access to the hard-to-reach body structures. Wherein, additional dangerous damage of healthy organs and structures is excluded. Micro dimensional instruments are used with special precision, and the x-ray irradiation dose during surgical control is even less, than allowed in modern conditions. Wide application of Ultrasound apparatus in intraoperative control (Sono Control Arm) provides maximal accuracy of surgical intervention without x-ray irradiation.

Special equipment allows virtual planning and calculation of optimal surgical entrances and use of micro dimensional instruments yet in preoperative phase.

For the activation of regenerative process, patient is injected by MIBRAR technology with autologous plasma, enriched by growth factors, anti-inflammatory factors and mesenchymal stem cells, also lipogenesis and separated stem cells, received from subcutaneous fat.

MIBRAR method is based exclusively on application of patient's own autologous substances.

### ***Patents and licenses***

All described above technologies, equipment and instruments, developed by professor Babayan, and are protected by patent.

### ***Advantages***

- Diagnostic and therapeutic events by MIBRAR method are micro invasive and applied without surgical incision.
- Chance of bleeding or blood loss is very low
- As a rule this method does not require general anesthesia, what allows avoiding side effects associated with narcosis. Patients with high risk for narcosis also can be operated.
- Absence of narcosis and completely micro invasive approach makes this method specially sparing and less burdensome.

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- There is no need in medication during or after surgical intervention. This way the chance of additional side effects and allergies is decreasing.
- Surgical interventions are done in outpatient conditions. Patient does not require the stay in hospital or after surgery care.
- There is no need in postoperative rehabilitation caused by the surgery itself.
- There is no need in rehabilitation equipment (wheel chair, crutches, orthopedic soles, bandages, etc.)
- Patient has no side effects, as his own autologous material being used.
- As MIBRAR method is based exclusively on application of patient's autologous material, there is no contraindication diseases or medications.
- Possible side effects that happen from traditional surgical technics (blood loss, infections, postoperative destabilization, disturbance of the scarring process, damage of the surrounding organs and structures, rejection reaction from the foreign body, instability of the endoprosthesis, etc.) are excluded during MIBRAR technic use.
- The results are visible after 4-12 weeks, depending from the specificity of surgical intervention during postoperative radiology exams (CT, MRI, x-ray and Ultrasound).
- Except the time for the surgery this method does not need additional time, also allows patient to carry on with every day and professional work activities.
- Surgical intervention does not cause physical limitations for the patient.
- Sparing micro invasive intervention significantly shortens rehabilitation time.
- MIBRAR allows avoiding end prosthesis, clamping, stiches and other artificial implants.
- MIBRAR method has anti-inflammatory characteristics, also quick acting and stable analgesic effect.
- MIBRAR method provides regeneration and reconstruction of damaged and completely absent structures accrued from traumas, damages and other diseases, aging changes, certain chronic and degenerative processes.
- Effectiveness of MIBRAR method does not depend on patient's age as process of regeneration happens at any age.
- MIBRAR technology used in traumatology, orthopedics and neurosurgery, on different parts of the body and musculoskeletal system for regeneration and reconstruction of bone structures, cartilages, tendons, for damaged muscles and ligaments, also on skin integuments, structures and tissues of central and peripheral nervous system.

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- Thanks to the micro invasiveness and absents of the narcosis, MIBRAR method has minimal load on patient's organism and allows application simultaneously on different structures and organs. Process of regeneration and reconstruction in different organs also happens simultaneously. Recovery of one organ has positive effect on the recovery of other, what leads to overall recovery effect and decreased recovery time. This advantage makes MIBRAR method unique, as no other surgical technic allows simultaneous intervention on different organs (for example, spine segments, joints, etc.) with minimal invasion and without general anesthesia.

### ***MIBRAR method can be applied in following areas of the medicine:***

- Traumatology and orthopedics
- Neurosurgery
- Maxillofacial surgery
- Dentistry
- Plastic surgery
- Ophthalmology
- Cosmetic surgery
- Cosmetic, esthetic dermatology
- Urology
- Abdominal surgery
- Gynecology
- Statistics

After thousands of surgeries done by professor Babayan, MIBRAR method was patented: <http://trademarkia.com/ctm/mibrar-015764401.htm> and has all statistically proved data about the effectiveness of the method, according to the international scientific criteria's.

Based on positive experience of last years, surely could be said, that above described advantages of micro invasive MIBRAR technology is a revolutionary breakthrough in modern medicine and opens up new possibilities in the future surgery.

### **Methods and Systems of MIBRAR**

#### ***Epiduroscopy method of MIBRAR system***

#### **Advantages compared to conventional epiduroscopy are**

Due to micro dimensionality of the diameter and greater flexibility, many difficult-to-reach structures can be achieved and thus several pathologies can be

treated, which would not be possible with conventional epiduroscopy and in fact represents a significantly lower risk for the patient.

Dilation of epidural space is performed with fluid pressure of the blood plasma not as with conventional metallic instruments that could injure the Dura Matar.

In the MIBRAR method, it should be emphasized that only the patient's own substances are used not as in conventional methods, drugs or other non-body active substances are used, so the MIBRAR method represents a lower load and a lower risk for the patient and excludes the side effects.

Epiduroscopy according to MIBRAR achieves a regeneration and reconstruction of destroyed spinal cord or other tissues and structures in the spinal canal, triggered by trauma or degenerative processes.

### ***Advantage of MIBRAR***

EN: <https://www.wgzm.de/en/home/our-surgical-techniques/#1491913558679-bcadf55e-7ffd>

DE: <https://www.wgzm.de/epiduroskopie-nach-mibrar/>

RU: <https://www.wgzm.de/ru/центр-позвоночника-и-суставов-мюнхен-wg/наши-операционные-техники/#1491916780528-8d53deed-c308>

### ***Existing modern methods***

Source Mackenzie spine solution: <https://mackenzie-spine.com/spinal-treatment-options/epiduroscopy/>

Source WIM Wirbelsäulen-Institut München: <https://wi-muenchen.de/wirbel-saeule/minimalinvasive-techniken/epiduroskopie.html>

### ***Endoscopy method of MIBRAR system***

In the case of spinal endoscopy according to MIBRAR, the great advantages compared to conventional endoscopy are that by micro dimensionality of the diameter, the entire procedure can be performed very gently without cutting, only with one stitch without injuring additional healthy tissue.

Especially in the presence of the degenerative intervertebral disc tissue, a recurrence, i.e. a new herniated disc, may occur after removal of the herniated disc. Because the degenerative intervertebral disc tissue represents an existing instability of the segment and this is not cured or eliminated by the sole removal of the intervertebral disc incident.

The spinal endoscopy according to the MIBRAR method serves not only to eliminate the consequences such as the removal of a herniated disc, but also – and this is crucial – to reconstruct and regenerate the affected segment as completely as possible – regardless of the cause of the pathology – whether trauma or degeneration. And this can lead to a complete restoration of the intervertebral disc shape, height and function.

**Advantage of MIBRAR**

EN:<https://www.wgzm.de/en/home/our-surgical-techniques/#1491914086716-f416ebe8-6d67>

DE: <https://www.wgzm.de/endoskopie-nach-mibrar/>

RU:<https://www.wgzm.de/ru/центр-позвочника-и-суставов-мюнхен-wg/наши-операционные-техники/#1491916797735-8903cf28-cc3b>

**Existing modern methods**

Source ANNALS OF TRANSLATIONAL MEDICINE:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6778275/>

Source RIWO SPINE: <https://www.riwospine.com/de/aerzte/wirbelsaeule-endoskopie/>

**Sono Control Arm of MIBRAR system**

Nowadays, sonography is used not only for diagnostics, but also for intra-operative therapeutic use to control the operation, i.e. to perform an operation under ultrasound.

Today's use of hands-free sonography or sonography control (without support for the Sono-Control arm) has the following drawbacks:

A hand of the surgeon is always occupied with the ultrasound head probe and is permanently busy with the post-corrections to create and hold a qualified, sonographic image.

Based on this years of experience, I developed the Sono Control Arm with a special holder for the ultrasonic head, which is as mobile as possible for the most diverse applications in the operating room in flowing, light movements and at the same time can be securely fixed with the utmost accuracy in any position with one handle, so as not to lose the sound layer of ultrasonic imaging.

The surgeon thus has both hands free and is relieved of the internal tension that the constant manual guidance and visual inspection of the ultrasound head entails. Instead, the surgeon can focus all his or her attention on the operation and the use of instruments.

**Advantage of MIBRAR**

EN: <https://www.wgzm.de/en/home/our-surgical-techniques/#1491914223958-dddc023f-e7fa>

DE: <https://www.wgzm.de/sono-control-arm-tm/>

RU:<https://www.wgzm.de/ru/центр-позвочника-и-суставов-мюнхен-wg/наши-операционные-техники/#1491916807176-f33b7ddf-a0b4>

**Existing modern methods**

Source NYSORA: <https://www.nysora.com/foundations-of-regional-anesthesia/equipment/introduction-ultrasound-guided-regional-anesthesia/>

Source DOCFORDOC: [http://www.docfordoc.de/ultraschallgesteuerte\\_injektion.php](http://www.docfordoc.de/ultraschallgesteuerte_injektion.php)

Source Springer Medizin: <https://www.springermedizin.de/ultraschallgesteuerte-interventionen-am-peripheren-nervensystem/11977126>

**Cyber Navi Hand of MIBRAR system**

The safe and successful execution of a minimally invasive operation is associated with a high degree of complexity and must face concrete technical challenges:

This is because the minimum access results in a minimal direct view of the operating room area and extremely restricts the optical control of the operating area.

The absence or severe restriction of the direct field of vision requires sophisticated devices with imaging techniques such as X-rays, ultrasound and endoscopy, which make the surgical area as well as the entire course of the operation visually controllable.

As a solution for these critical points in minimally invasive operations, I have developed a special device for targeted navigation – including the cyber-navi-hand – as well as several special instruments that facilitate and optimize the minimally invasive procedures.

Today’s diagnostic, radiological techniques such as MRI, CT, PET-CT, PET-MRI and other imaging techniques offer a wide range of visual representation of almost all tissues of the human body.

Nevertheless, it is not possible to translate this valuable and extensive information directly into a precise, intra-operative, ongoing operations control instrument.

In recent years, I have developed a very precise procedure for this very issue, namely the use of this diverse information of the imaging representation for direct intra-operative control before and during a minimal or micro-invasive procedure. I have a very sophisticated software that allows to fuse the existing diagnostic-radiological DICOM images and the real-time imagery created in the operating room.

This allows to avoid the statistically significant medical errors of spinal surgery as far as possible.

**Advantage of MIBRAR**

EN: <https://www.wgzm.de/en/home/our-surgical-techniques/#1491915996988-8712bb12-b90e>

DE: <https://www.wgzm.de/cyber-navi-hand-tm/>



RU:<https://www.wgzm.de/ru/центр-позвоночника-и-суставов-мюнхен-wg/наши-операционные-техники/#1491916818717-067a051f-7063>

### ***Existing modern methods***

Source Medtronic: <https://www.medtronic.com/us-en/healthcare-professionals/products/neurological/surgical-imaging-systems/o-arm.html>

### ***RRBSW***

In the case of various spinal pathologies depending on pathology, various corresponding conservative or surgical treatment methods are used in modern medicine. Conservative methods can lead to the elimination or relief of symptoms, but cannot reverse or positively influence the degenerative process as a cause. In advanced degenerative processes, where there is a deformation of the intervertebral disc or an entire segment and the conservative treatment is already powerless, surgical methods are used, which lead to a reconstruction of the intervertebral discs as well as intervertebral disc compartments and the corresponding segments.

In most cases, patients are treated with intervertebral disc prostheses, screws or other artificial implants, which can lead to various complications or chronic pain syndromes, neurological failures and movement restrictions. These, in turn, can lead to quality of life restrictions.

In summary, it can be said that, at the present stage of medicine, there is no way to reverse degeneration or deformation in the spinal segments in order to naturally restore or reconstruct the spinal structures. In addition, conservative methods and in particular surgical methods lead to complications and can carry the risk of side effects. According to conventional state-of-the-art standards, a large invasive operation is performed under general anesthetic.

In 2004 I was awarded a regenerative reconstruction of the intervertebral disc which led to the start of a series of research. In 2014, the MIBRAR method I developed, which is used in the regenerative reconstruction of all structures of the musculoskeletal system, for the first time and unique in the world with success applied to intervertebral discs and facet joints Be.

### ***Advantage of MIBRAR***

EN: <https://www.wgzm.de/en/home/our-surgical-techniques/#1530792363457-4ef18cb9-fa84>

DE:<https://www.wgzm.de/rrbsw-mibrar-regeneration-und-rekonstruktion-der-bandscheiben-und-segmenten-der-wirbelsaeulen/>

RU:<https://www.wgzm.de/ru/центр-позвоночника-и-суставов-мюнхен-wg/наши-операционные-техники/#1530703563071-16975fe6-b3cd>

**Existing modern methods**

Source Avicenna Klinik: <https://avicenna-klinik.com/en/spine-treatment/inter-vertebral-disc-prosthesis-cervical-spine/>

Source Gelenk-Klinik: <https://gelenk-klinik.de/wirbelsaeule/wirbelsaeulen-op/wirbelsaeulenversteifung-spondylodese.html>

**RRGGS**

**Basic definition**

In contrast to the classic procedure where already injured structures are still damaged, replaced by an artificial implant or by means of new injuries to the healthy tissue by laying surgical access, the RRGGS method of the system MIBRAR® a morphological regeneration process is guided in the RRGGS method of the system MIBRAR® body-preserving without injuries to the healthy tissue, which leads via a natural path to the macroscopic reconstruction and restoration of the functioning of damaged body structures.

The RRGGS method of the MIBRAR system is an interventional treatment method combined with an exclusively micro invasive surgical technique and stimulation for the regeneration of body tissue as well as the reconstruction of body structures.

The RRGGS method of the MIBRAR system uses purely the body's own substances, which are used in a converted form and enable the regeneration process to the complete reconstruction of the affected diseased structures.

**Advantage of MIBRAR**

EN: translation in progress

DE: <https://www.wgzm.de/rrggs-mibrar-regenerative-rekonstruktion-der-gelenke-und-gelenkstrukturen-nach-mibrar/>

RU: translation in progress

**Existing modern methods**

Source Ortho Zentrum: <https://www.ortho-zentrum.de/unsere-leistungen/operationen/hueftendoprothese/>

Source Endo Prothetik Zentrum: <https://en.orthomedic-of.de/endoprothetikzentrum/>

Source NetDoktor: <https://www.netdoktor.de/therapien/endoprothese/knie-tep/>

Source Capio: <https://www.de.capio.com/orthopaedie-wiki/schulter-op/>

**Clinical Cases**

Spine: <https://www.wgzm.de/wirbelsaeule/>

Joints: <https://www.wgzm.de/gelenke/>