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**The Effect of Invasive Treatments Applied to  
Chronic Pains  
on the Decrease of Pain Level  
and the Alteration of the Quality of Life**

Doctoral (Ph.D.) dissertation

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## List of Publications

### Scientific Articles

**1. I, Molnár;** G, Hegyi; L, Zsom; C, Saahs; J, Vagedes; G, Kapócs; Z, Kovács; M-G, Sterner; H, Szőke: Celiac plexus block increases quality of life in patients with pancreatic cancer  
JOURNAL OF PAIN RESEARCH 12: 1 pp. 307-315., 9 p. (2019), **IF = 2,645.**

**2. Molnár, I;** Hegyi, G; Kovács, Z; Kapócs, G; Szőke, H:  
A palliatív jellegű neuráalterápia hatása idült fájdalmak csökkentésében  
IDEGGYOGYASZATI SZEMLE / CLINICAL NEUROSCIENCE 72: 1-2 pp. 23-31., 9 p.  
(2019), **IF = 0,252.**

**3. Molnár, I;** Deák, BZs; Hegyi, G; Kovács, Z; Kapócs, G; Szőke, H  
A palliatív neuráalterápia életminőségre gyakorolt hatása inoperábilis alsó végtagi obliteratív verőérbetegeknél. IDEGGYOGYASZATI SZEMLE / CLINICAL NEUROSCIENCE 71:11-12 pp. 393-402., 10 p. (2018), **IF = 0,252.**

**4. Molnár, I;** Szőke, H; Hegyi, G  
Effects of neural therapy on quality of life in patients suffering from Raynaud syndrome  
EUROPEAN JOURNAL OF INTEGRATIVE MEDICINE 18 pp. 59-65., 7 p. (2018)  
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Newer application of Oncothermia to nonmalignant diseases such as Dupuytren's contracture of the hand and chronic lower back pain lasting more than 4 weeks  
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### **Book Chapters**

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Effects of Permanent Acupuncture of YNSA on Quality of Life in Patients Suffering From Post-Stroke Syndrome, JOURNAL OF COMPLEMENTARY MEDICINE & ALTERNATIVE HEALTHCARE 6: 1 Paper: 555677 (2018).

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YNSA permanent acupuncture application for post-stroke syndrome

Medical and Clinical Archives 1: 1 pp. 1-8., 8 p. (2018).

**3. Molnár I;** Máté, Á; Szőke, H; Hegyi, G

Effects of Permanent Acupuncture of YNSA (Yamamoto New Scalp Acupuncture) on Quality of Life in Patients Suffering from Post-Stroke Syndrome

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**5. Mate, A;** **Molnar, I;** Petrovics, G; Hegyi, G

Oncothermia-Booster (Targeted Radiofrequency) Treatment -in Some Non- Oncological

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**8. Molnár, I** A szülési fájdalom epidurális csillapításának lehetőségei

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## **INTRODUCTION**

My dissertation is based on my medical practice of the nearly 30-year-long anesthesiologic-intensive therapy and on the medical practice of the more than 20-year-long pain therapy; furthermore, on my theoretical knowledge pertaining to my cardiologic specialist examination and on my studies of forensic medicine and palliative medicine.

As an anesthesiologist, I apply such invasive pain therapeutical methods as belong to the modern interventional pain therapy (Interventional Pain Management--IPM) pertaining to academic medical care, at the same time, they are part of the neuraltherapy belonging to the complementary medicine. The methodological reason for the choice of my topic was that I could assess the effect of my regularly applied invasive treatments to chronic pain, and the alteration in the quality of life among patients needing palliative treatment.

While I was planning my investigation, I did not find such Hungarian or foreign publications in which, similarly to my work, an assessment was made using analog, complementary, subjective, and objective methods aiming to examine a patient group needing palliative treatment, pertaining to the effectiveness on chronic pain and the proceeding changes in the quality of life of identical, minimally invasive, pain- therapeutical treatments. Thus I approached my original prospective investigation with the aim of exploration and justification. I unfold the details, the results, and the multidisciplinary conclusions of my research using the basis of different medical special fields, and relevant data of the national public health and economy, furthermore, medicolegal pages.

### **Pain and Its Examination**

Beside the fact that “Alleviating pain is a divine act” (Hippocrates, 460-375 BC), according to Aristotle (384-322 BC), “it is the doctor’s obligation to alleviate the suffering and the pain of the patient.” According to the 1997 CLIV. Hungarian Public Health Act, under Section Six titled “The Right to Health Treatment”, “every patient has the right to ... the alleviation of pain and to the alleviation of suffering”, irrespective of the original disease generating the pain, or its stage and its ability to be treated. Despite this, the chronic pain due to oncotic and non-oncotic diseases posits a grave sanitary, social, and economic problem even in the developed countries, where in 50% of the cases, relief of pain is inadequate because not the appropriate medicine or not the appropriate measure of medicine is administered (WHO, 2008).

It is a subjective concept with significance and strain individually, thus the objectivization of its intensity can be achieved through patients' self-evaluation and the use of questionnaires. The most widely used are the one-dimensional pain questionnaires due to their simplicity, comprehensibility, validity, and international acceptance. Such is, for instance, the NRS (Numerical Rating Scale).

### **On Health and the Quality of Life**

According to the definition accepted by the WHO in 1948, health is "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Health is defined by such factors as the individual's geno- and phenotype, way of life, macro- and micro environments; furthermore, the structure and the social sensitivity of the society. Its promotion and optimalization are influenced by the interrelationships of age, sex, geographical area, and the social environment.

Following the definition of health, the definition of the quality of life came up, as the indicator referring to the relation between an objective life situation and its subjective evaluation. WHO defines the quality of life as follows: "An individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment." The quality of life is, therefore, a multidimensional subjective concept. It is not possible to measure it objectively with an instrument, on account of its characteristics. The questionee can render evaluable information the most credibly through self-evaluation in the form of a questionnaire. One of the most frequently used generic quality of life questionnaires, adapted for Hungary also, is the Short Form-36 which, because of its simplicity, obviousness, and validity, is used for defining the state of health and following the changes in it.

One of the greatest recognitions of the medical paradigm shifts taking place in the past decades, accepted also by the WHO, is that the quality of health care and its effectiveness is to be defined from the viewpoint of the patient as well. It is primarily characteristic of patients suffering from chronic diseases that the changes of different "objective" measurable parameters and "hard" endpoints (*mortality, morbidity*) are to a lesser extent in relation to identical patients' functional, psychic, and social state--totalizing it with the way they feel, therefore, a more and more significant role is given to the patients' subjective evaluation of their state of health and quality of life. In defining the state of health, the self-evaluative "Health-Related Quality of

Life” (HRQoL) questionnaires have become widespread and accepted, since they facilitate the evaluation of the effectiveness of health care, the optimization of therapies, the comparison of impacts stemming from different diseases, moreover, the preparation of medical statistics, and the performing of cost-effectiveness and medicoeconomic analyses.

### **The Impact of Pain on the Quality of Life**

According to the results of questionnaires dealing with *disease-specific* quality of life, pain damages the quality of life as much as diabetes, depression, chronic respiratory insufficiency or congestive cardiac insufficiency. During the study of the biochemical, neuroanatomical, electrophysiological, genetic, and psychological components of chronic pain, its morbid neurohumoral organ-damaging effects became certified, which emphasizes the importance of pain therapy. Still, the relief of chronic pains may have beneficial effects on the sanitary, economic, and social spheres of the society as well, since it has a direct effect on the ability for work, the social benefits, the frequency of medical visits, the prescription-only medicaments, and the use of the health care, moreover, on the financial situation of the patient’s family.

The aim of the modern, complex, multimodal pain therapy is to combine scientific novelties (both pharmacology and analgesic methods and means) with natural cures based on experiences of a thousand years and modern empirical cures (for instance, traditional Chinese cure, neuraltherapy) for the sake of increasing efficiency and decreasing side effects. Neuraltherapy is elemental part of integrative medicine; its application in patient treatment is subject to a medical diploma. It is either not or little known in Hungary. The invasive pain-therapeutical interventions elaborated in my work are known and accepted both in the fields of neuraltherapy and Interventional Pain Management

### **About My Research**

The observations and experiences of my pain-therapeutical patient treatment made me carry out such a prospective assessment, during which I should be able to measure the accomplished changes in pain due to my medical interventions, and the concomitant effects on the quality of life, with due accuracy and credibility.

#### ***Aims:***

1 - To set safe patient treatment as a priority during the planned examination and treatment of patients.



2 - To measure and document with complementary subjective and objective methods the effect of patient-specific therapy on the intensity of chronic pains in the group of patients *needing palliative treatment*, and on account of this, what changes take place.

3 - To apply modern, *non-invasive* pain-therapeutical methods *within my competence which are subsidized by the state national insurance*, beside the application of complex non-invasive pain therapy, to alleviate the chronic pains of patients in advanced state.

4 - To estimate the safety, the instrument requirement, and the applicability in the outpatient treatment form of the applied invasive analgesic methods in the group of patients *needing palliative treatment*.

5 - To use such (inter)nationally validated questionnaires for the *subjective* assessment as have been used for several studies successfully, and have been qualified to be trustworthy and accurate; at the same time, they are easily understandable, simple, and not demanding for patients suffering from pains.

6 - To use such *objective* methods as are credible and accurate to follow the changes in the condition of health of a given patient group.

7 - To follow the correlation of the changes with the age of the patients and the dolorogenic underlying disease.

8 - To form an opinion about the *effectiveness* and the *safety* of the applied invasive methods, on the basis of the change in the patients' condition of health.

9- To compare my results with international medical literature data dealing with *similar issues*, and the representative norms of the healthy population of Hungary.

***Hypotheses***--I assert that

1. with the applied pain-therapeutical methods, pain can be effectively alleviated not only on the basis of the international medical literature data, but also on the basis of Hungary's practice,

2. due to the alleviation of chronic, excruciating pain, the quality of life of the patients may favorably change,

3. in the cases of advanced and terminal pathological processes, it is also necessary to apply an adequate, complex pain therapy, since with this, we provide humane circumstances for those in need, which is the basis, the aim, and the import of medicine, among others, palliative medicine,

4. every kind of health care needs to take place in order to improve the patient's condition of health. In accordance with this, pain therapy also needs to be applied with a multidimensional approach, in a complex form, multimodally; that is, not only the problematic body area should

be concentrated on, but with a holistic approach, individually, according to the biopsychosocial pain theory, the whole human body as well as the patient's personality, cast of mind, and circumstances must be taken notice of so that the therapy should be effective--irrespective of the age and the underlying disease of the patient,

5. irrespective of the pathological process, the life expectancy, the age, and the sex of the patient, pain can be alleviated with a circumspect invasive treatment, as a result, the quality of life can be improved.

6. alleviation of each patient's suffering has a positive effect not only on the persons in question, but also on their family members as well as the whole society.

### **Originality, Circumstances, and Difficulties of the Research**

**I.** *My survey is unique and suppletory*, because the published studies dealing with the quality of life specify the age, the pathological process, the therapy, the nationality, or the sex of the patients. So far, there have not been published results from such an (inter)national survey as, similarly to the methods, details, and accuracy of my work, would analyze the change in pain intensity and its effect on the quality of life in a group of patients needing a palliative treatment in a general outpatient pain clinic, as a result of an "individual" invasive analgesic therapy.

#### **II.** *Circumstances of the Research:*

- I did not do the surveys and the assessment of the results as a young researcher, not in a clinical institute, instead, beside my daily anesthesiologic and intensive therapeutic tasks, moreover, beside my consultation hours set on a weekly basis in the outpatient pain clinic.

- Consultation hours took place in an separate room, independent of other consultations.

- Patients could participate in the examination voluntarily, without a special selection, if they met the criteria of classification and exclusion.

- I performed the invasive pain therapeutical interventions during the consultation hours in an aseptic environment, in an operating theater in accord with surgical interventions, with the help of an operating theater staff supervising a C-arm fluoroscope and an iodine-free contrast medium.

- Due to the alleviating pain therapeutical treatments done during outpatient care, patients were not required to be hospitalized, which is not an insignificant fact economically.

- I was able to attest the accomplished changes in the condition of health of the patients with the application of internationally acknowledged, validated subjective and objective measuring methods.

*Restrictions (confounders) and difficulties* on the part of the patients and the methods:

1. It was not possible to establish a control group during my research since

- from among the patients suffering from very strong pains, it was not possible to establish “treated” and “not-treated” patient groups, neither from professional, nor from legal or human ethical viewpoints.

- I had not the possibility to compare the results of the applied methods with available results of different, conservative analgesic methods, since each patient participating in the examination, before coming to our outpatient department, had received health care in accordance with their underlying disease, during which they had undergone the same, appropriately conservative, adjuvant pain therapeutical treatment according to the professional protocol. In this way, multiple-stage conservative treatment attempts would not have served the interests of the patients.

In the absence of the possibility of comparison, I applied separately a *self-control method* to credibly assess the accomplished changes in the condition of each patient, during which I compared each patient’s subjective and objective measured results following the treatment with the identical patient’s values before the treatment.

2. It was not easy to gain the confidence and cooperation of those patients who, on account of their underlying diseases causing pain, had already been at different consultations, had received several hospital treatments, and in general, had been aware of the advanced state of their underlying diseases.

3. I needed a comprehensive research to be able to apply such subjective and objective assessment methods as are accepted in the international medical literature, validated, adapted for Hungarian language, had already yielded trustworthy results in several examinations, and which do not posit a greater burden for suffering patients being exhausted by their diseases and pains. Using complicated and time-consuming measuring methods would have caused inaccuracy and lack of cooperation on the part of the patients.

4. The choice of plausibly effective and safe pain therapeutical methods belonging to my professional competence meant a further difficulty. I made my therapy-related decisions based on the assessment of medical opinions defining the stages of the advanced underlying disease, furthermore, the results of extensive imaging and histological examination. It was not possible for me to enumerate the data, the basis of my decision, pertaining to each patient--because of the limited space of my dissertation--therefore, I present the conditions and the results in a summative form according to groups of disease.

5. I am aware of the theory behind the highest-level methods found in the internationally

accepted, modern interventional pain therapeutical suggestions. In Hungary, however, their application is limited by the *anesthesiologic professional competence* and the *state national insurance*.

6. Follow-up of the patients in the long run meant a marked difficulty. While in other studies the follow-up covers 3 or 6 months, my study is limited on a 35 +/-2-day period on account of the advanced state of the underlying diseases and the social and health-cultural traits characteristic of the population of our region.

### **Material and Method**

I pursued my prospective study in our outpatient pain clinic with the permit of our Research Ethics Committee (*Ref. No.: 244/2016*) and the written consent of the patients. In my survey, every patient could voluntarily participate irrespective of their demographic and anamnestic data, on the following conditions.

Criteria of Classification:

- Clear diagnosis.
- The complex conservative therapy applied till then had not alleviated the pains properly, the intensity of the pains (the NRS: Numerical Rating Scale) is 6-7 or higher.
- Patients with clear consciousness were able to understand the properly detailed information concerning the planned examinations and the invasive analgesic intervention; with their signature they consented to the application of the intervention and declared their cooperation.
- Compensated cardiopulmonary state, water-electrolyte balance.

*Criteria of Exclusion:*

- hemostatic disorders
- illiteracy, since the questionnaires of self-evaluation could only be filled in alone and personally.

### **Outline of the Work and Its Process**

The period of survey started in 2016 and covered 6 months. During this time, I subjectively and objectively measured, documented, and followed the changes of condition connectable to the applied invasive treatments, at each patient separately.

### The Employed Measuring Methods

<p><b>Methods for Following the Subjective Change of Condition</b></p>	<ul style="list-style-type: none"> <li>- Numerical Rating Scale (NRS)</li> <li>- Short Form-36 (SF-36)</li> </ul>
<p><b>Objective Measuring Methods</b></p>	<ul style="list-style-type: none"> <li>- Ankle-Brachial Index (ABI)</li> <li>- Cutaneous Temperature</li> <li>- Trophic Disorders of the Limbs</li> <li>- Neurological Symptoms</li> <li>- Need of opiates</li> </ul>

Beside the previously elaborated plan of examination, each patient had an individual plan of therapy depending on their underlying disease which was explained in proper detail primarily to the patients, but if it was necessary, to their nearest relative as well.

I took notice of the known and treated underlying and concomitant diseases during my analyses. I did not alter the previously set medication, since it did not influence the examination.

The first examinations took place following the documentation of the anamnesis, the physical state, the comprehensive and appropriately detailed information of the patients, and the signature of the consent forms. Then I made the preoperative preparations (laboratory test, intravenous access, fluid and electrolyte intake in infusion); following these preparations, in an operating theater, I performed the pain therapeutical interventions hereinafter. After the following observation, with stabile venous parameters, our patients were taken home by their relatives or with an ambulance.

The second control examination took place 35 +/-2 days following the completion of the pain therapeutical treatments. This date was set so that longer time should pass following the performed treatments for the sake of the greater credibility of the results, bearing in mind the grave and advanced state of the patients underlying diseases. Each patient underwent both examinations on the same premises, under the same circumstances (room temperature T=21°C), and in the same order.

During both examinations, each patient, taking approximately 20 minutes, voluntarily and alone (independently of the other patients, the hospital staff, and their relatives) filled in the validated Hungarian version of the NRS and the SF-36 questionnaires dealing with the general quality of life; following this, I performed the objective measurements and verifications.

## Results

### Demographic Characteristics of All the Patients

Surveys through self-evaluation did not cause difficulty for the patients, they did not have a negative effect on the patients' condition of health. None of the patients denied the possibility of participation in the surveys, and during the examination, no one broke its continuance. During the 6-month examination period, 236 patients out of all the treated patients could participate in both surveys in accordance with the plan of examination. Out of the 236 patients, 3 women and 2 men did not fill in the SF-36 questionnaire appropriately. I regarded the lost data of the five patients as a *selectional distorting* factor; however, its small number does not influence the end result, therefore, it may be considered to be insignificant.

In my work, I assessed the demographic data of 231 patients and their 462 NRS and SF-36 questionnaires, furthermore, the data from the objective measurement results. Out of the 231 patients, 131 (56.71%) were women and 100 (43.29%) were men. Our patients were 62 years old on average, spanning from 30 to 90 years of age.

Beside the sex and the age, data of the concomitant diseases were also processed. The demographic data of our patients can be seen in the following table.

### Demographic Data of the Examined Patients

Sex/ Person	Average Age (min.- max.)	SD	Concomitant Diseases							
			IC	PAD	HT	DM	cHL	Obesity	Smok.	Dep.
Male/ 100	57 (45-87)	13.2	57	85	93	52	94	19	66	9
Female/ 131	41 (32-90)	15.0	49	66	79	44	84	26	59	17
In Total/ 231	65 (35-90)	14.3	106	151	172	96	178	45	125	26

**Abbreviations:** IC=Ischemic Cardiopathy; PAD=Peripheral Artery Disease; HT=Hypertension; DM=Diabetes Mellitus; cHL=combined Hyperlipidemia; Obesity-BMI ( $\geq 30$ -39.9 kg/m<sup>2</sup>); Smok.=Smoking (>15 cigarettes daily); Dep.=Recurrent Depression; SD=Standard Deviation

Every detail of the study, in a properly informative format, is presented in the following table.

**Pathological processes triggering pain, their palliative-invasive treatment and results**

<b>Patient groups:</b>	<b>-1- Patients with Lower-Limb Obliterative Artery and Ischemic Pain</b>	<b>-2- Patients with Lumbar Intervertebral Disk Hernia and Radicular and Vertebral Pains</b>	<b>-3- Patients with Pancreatic Cancer and Visceral and Neuralgic Pains</b>	<b>-4- Patients with Upper-Limb Raynaud's Syndrome and Ischemic Pain</b>
<b>Number/Sex/Age of Patients</b>	<b>124</b> 69 males--66.8 years of age 55 females--64.3 years of age	<b>79</b> 42 males--42 years of age 37 females--50 years of age	<b>16</b> 5 males--57 years of age 11 females--66 years of age	<b>12</b> 2 males--59 years of age 10 females--41 years of age
<b>Invasive-therapeutic Treatments</b>	Percutaneous chemical lumbar sympatectomy (pCLS)	Epidural analgesia (EDA)	Percutaneous retrocruial neurolytic celiac plexus block (PRNCPB)	Ganglion stellate block (gSB)
<b>Pain Intensity, Rate of Decrease</b>	NRS=from 9-10 NRS=to 1-3 decrease (p=0,001)	NRS=from 8-10 NRS=to 1-3 decrease (p=0,002)	NRS=from 9-10 NRS=to 2-3 decrease (p=0,002)	NRS=from 9-10 NRS=to 2-3 decrease (p=0,001)
<b>Alteration of SF-36 Values</b>	p≤0,002 level of significance improvement	p≤0,005 level of significance improvement	p<0,001 level of significance improvement	p≤0,005 level of significance improvement
<b>Alteration of Skin Temperature</b>	It rose from 27,6°C to 31,2°C (p≤0,005).			It rose from 22,6°C to 33,8°C (p≤0,002).
<b>Others</b>	Rate of the alteration in the Ankle-Brachial Index: It rose from 0.67 to 0.83. (p≤0,005)	Regression/Cease of symptoms	Reduction of the dose of major opiates, remission of obstipation	Decrease or cease of trophic disorders

## **Consultation**

### **I. Concerning Pain**

Several international studies demonstrate that chronic pain

(i) leads, in the case of the *patients*, to bodily and psychic suffering, damage to their human dignity, absence from family and social life,

(ii) means serious social problem for the *relatives* as to the arrangement of continual attendance and care, the unmet obligations at the workplace, the price of the medication and medical aids--beside the psychic burden on account of the sympathy felt toward the patient.

(iii) causes an ever growing amount of professional tasks and psychic burden for the *health workers in charge of the treatment and the attendance*,

(iv) has significant *national health and economic* impact.

The efficacy of an appropriate, complex, multimodal pain therapy may lead to the evident improvement of the quality of life even in the case of patients suffering from advanced-stage underlying diseases.

### **II. Characteristics concerning the Uniqueness of my Research**

- My research is unique and original, since there is no publication which would deal with the effect of my interventional pain therapy on suffering, during palliative treatment, combining similar subjective and objective measuring methods; moreover, which would deal with the changes in the quality of life stemming from the therapy above in the case of patients with different advanced-state underlying diseases.

- I organized, completed, and assessed alone the greater part of the research, beside daily anesthesiologic and intensive therapeutic tasks-- laying stress on the safety of the patients--as a public servant and not as a full-time researcher in Hungary.

- The underlying diseases of the patients participating in my survey with the permit of the Research-Ethical Committee of the Institute had already been diagnosed by the respective medical fields, they had already been treated in accordance with their own professional protocols. I was not able to influence their advanced pathological process.

- I conducted the surveys with such internationally accepted, validated, subjective, and objective examining methods adapted for Hungarian language as did not posit a burden for the patients.

- The authenticity of the results of my survey was ensured by the patients' self-evaluative uninfluenced answers in questionnaires and the objective measured values.

- The applied invasive pain therapeutical methods did not cause life-threatening



complications to the patients, their side effects (*genitofemoral nerve irritation, due to the sympathicolysis not greater than 10% arterial blood pressure drop compared with the initial value, local pain during the neurolytic drug administration, Horner's syndrome*) ceased without sequelae within a short time spontaneously or due to a conservative treatment; they did not affect the daily life of the patients.

- On the basis of my results, such a similar HRQoL survey could be initiated as extends to less advanced-stage patients and longer follow-up.

- My analysis is not from the viewpoint of economy; it does not contain economically measurable and estimable phenomena or factors. My results, however, may lead to sanitary, economic, and sociological conclusions.

- Despite the fact that I conducted my research alone, for the efficient patient attendance, the presence of a properly emphatic assistance was indispensable, as well as the cooperative readiness of the operating theater and the positive attitude of the other medical fields.

### **III. Concerning Interventional Pain Therapeutical Treatments**

- On the basis of my experience and results, interventional pain therapeutical methods based on the elements of neuraltherapy, with careful application, are safe for the patients and can alleviate their pains efficiently. The frequency of possible complications in the case of appropriate personal and material conditions can be minimized.

Material conditions: For the neurolysis, an operating theater, C-arm fluoroscope, iodine-free contrast medium, proper instruments (needles, syringes, isolation, disinfectants) are needed; for the examination, preparation, and treatment of the patients, appropriate rooms are necessary. International medical literature recommends similar interventional pain therapeutical treatments to be administered *using a CT or MRI*. However, on the premises if the examination, I did not have the possibility of using a CT or MRI; and there no such a place in Hungary where during the consultation hours of the Outpatient Pain Clinic this would be possible. *Using ultrasonography*, for elective surgical operations, *limb* regional anesthesia can be performed with a high degree of accuracy. The condition of which is a good-quality, high-resolution, portable ultrasonography device and a trained staff--where my examinations took place, these conditions were not met. Moreover, limitations of the ultrasonography need to be taken notice of: (i) image resolution is poor in the case of small-gauge needles, (ii) in deeper structures, on account of the interferences, artefacts, overlapping schemata (e.g., a tumorous mass), loss of details needs to be considered, (iii) imaging definitely *depends on the performing person*, (iv) physical and psychic condition and compliance of the patients suffering from chronic pain,

waiting for regional anesthesia, are by no means the same, e.g., neither the patients with a lower-limb obliterative aortic disease (*because of the compression of the abdominal aorta*), nor the ones with pancreatic cancer (*on account of the compression of the upper abdominal space-occupying process*) can tolerate ventral position for a longer period, thus the eye-controlled intervention cannot last long. The ultrasonography thus can complement, but not replace, fluoroscopy and contrast-medium location.

*Personal conditions:* The physician applying the treatment must be well prepared to recognize the precise diagnosis, to adequately choose from the possible treatments, to perform the semi-invasive interventions without complications, to recognize and treat possible complications in time (*to treat a patient in critical condition according to the ABCDE approach (Airways, Breathing, Circulation, Disability, Exposure)--for the Basic Life Support, but rather for the Advanced Life Support*).

The minimally invasive pain therapeutical methods I apply are cost-effective because they do not need many instruments and media; they can be applied both in the outpatient and the inpatient treatments.

#### **IV. Concerning Results and Treatments**

- In the pre- and post-therapeutic period, during the complex surveys conducted twice in the case of each patient, furthermore, during the data collection and assessment, I was convinced that the NRS and the SF-36 used simultaneously and the applied disease-specific objective measuring methods are suitable, trustworthy, and accurate for me to reach my objectives; moreover, they complement each other appropriately.

- In all the four groups, in the case of each patient, pain therapy was surface therapy; I was not able to render a treatment pertaining to the cause of a disease. Despite this fact, the results evidently demonstrated that the alleviation of pain--even if for a short period--resulted in the improvement of values concerning the quality of life, irrespective of underlying diseases, age group, or sex. The subjective as well as the measurable objective results, in general, improved at <0,005 level of significance.

- In the SF-36 questionnaire, only in the dimension of the Physical Role (PR) could there be ascertained an alteration dependent on age: The older the patients were, the less improvement could be observed in their physical loading capacity. This phenomenon is, presumably, due to the aging and its attendant limitations and degenerative processes of the human body.

### **Concerning the Results according to Patient Groups**

For the group of *patients of lower-limb obliterative arterial diseases suffering from ischemic pains*, altogether 163 patients were selected, but I was able to achieve the control measurements due after 35 ( $\pm 2$ ) days only with 124 patients. From the 39 patients left out, 21 were men (average age:  $61 \pm 5$  years old) and 18 were women (average age:  $59 \pm 5$  years old). In all of their anamnesis, advanced-state general arteriosclerosis, diabetes mellitus, and intensive smoking also in the period of limb pains could be found. In the period following the selection, the first survey then the pCLS, because of the PAD progression, critical limb ischemia (CLI) evolved, and the major amputation of the limb became unavoidable. This is the reason why the control examination did not take place, and the data analysis of the patients in question did not happen. On the basis of the similarity of initial parameters, this fact did not cause significant selectional and observational distortion. The pCLS is unable to improve, self-evidently, the morphological discrepancies unsuited for surgical revascularization in the case of patients of lower-limb obliterative arterial diseases in Fontaine stage II/b (less than 200 meters of walking). However, it causes parasympathetical dominance in the vascular innervation of the limb, which has an advantageous effect on the collateral circulation, thereby on the tissular ischemia; moreover, the afferentation of the pain is hindered. The pCLS performed under radiological and contrast-medium control did not cause in my patients any side effect or complication with life-threatening or permanent damage.

The efficacy of the celiac ganglia neurolysis, performed to alleviate the pains stemming from the patulous state of inoperability of the pancreatic cancer, under the period of the examination, proved to be convincing. Demand for moderate or weak narcotic analgesics remained on account of the aggressivity and size of the tumour; in certain cases, the demand for major opiates also remained--but in the case of each patient, in a reduced dosage. I was not able to influence the advanced-stage malignant pathological process and the patient's life expectancy, moreover, I had no possibility for a longer follow-up on account of the additional progression of the malignant pathological process. The celiac ganglion is difficult to approach due to its topographic anatomy. But with adequate anatomical knowledge and under obligatory radiological and contrast-medium eye-control, during the block/neurolysis, life-threatening complication, according to the medical literature also, rarely occurs. As an alternative to the percutaneous retrocrural neurolytic celiac plexus block (PRNCPB) performed by me, permanent cannulation of the epidural space at appropriate height may come into question. Its performance have neither personal nor technical obstacles in our outpatient clinic. However, several factors make the widespread application of the intervention difficult, both from the

viewpoint of the patient, and from the viewpoint of the Hungarian health care management.

Patients suffering from lumbar spinal disk herniation had a favorable prognosis since they belonged to the age group fit for work; moreover, the pathological process in question was not incurable. Despite this fact, I had good results from those patients who were motivated both socially and psychically in regaining their ability for work, and who made efforts to retain their familial and social positions. With patients with a different disposition, any kind of medical treatment would result in a moderate improvement in their condition, and that is only temporarily, but the somatization, centralization of their pains lead to “endless pain”, on account of which they claim regular medical treatment. In the period before the survey detailed in my dissertation, I achieved spectacular improvement in the case of patients suffering from spondylopathy, applying caudolumbar epiduroscopy and epiduroplasty (in Hungary, they are less known or unknown); however, their systematic introduction did not take place because of professional competence and the lack of state national insurance support.

From among my *patients suffering from Raynaud's Syndrome*, many came back for treatments when the cold season triggering vasospasm set in. The ganglion stellate blocks always provide for spectacular results temporarily. As an alternative to the intervention, permanent cervical epidural cannulation (if several difficulties to manage it would not prevent it) or thoracic surgical thoracoscopic upper-back sympathectomy would come into question.

## **Conclusions**

In my study, the objectively and subjectively measured results of the applied palliative invasive analgesic treatments unanimously proved that statistically significant changes in the quality of life took place in all the four advanced-state patient groups, due to the alleviation of pain.

Despite the positive changes, in my survey, on the basis of the 35 ( $\pm 2$ )-day-long follow-up, it is not possible to draw long-term conclusions. The alleviation of suffering, however, and due to this, improvement in the quality of life, even if for a short time, can provide for human circumstances for the patients and their relatives, moreover, it can give encouragement and necessary psychic strength to health workers for their work.

To alleviate suffering is our legal, human, and medical obligation--irrespective of the life expectancy of the suffering patient.

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