UNIVERSITY „OVIDIUS" CONSTANȚA

DOCTORAL SCHOOL OF MEDICINE
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ANATOMO-CLINICAL AND FUNCTIONAL CORRELATIONS IN LIGAMENT INSTABILITY IN KNEE OSTEOARTHRITIS

- SUMMARY OF THE DOCTORAL THESIS-

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INTRODUCTION

The term osteoarthritis is first listed in the Nomenclature of diseases published by the Royal Medical College in London in 1869. In 1890, the doctor Archibald referred to the disease called ''osteoarthritis' as a condition with separate entity present in the medical literature. From 1960 to 2000 the term ''osteoarthroza' appears, especially in the British medical literature. Osteoarthrosis being considered a non-inflammatory condition. But since 1950, with the increasing emphasis on the inflammatory character of the disease, the term ''osteoarthritis' becomes well anchored in medical literature, a term which is retained until now.

It is estimated that between 10% and 15% of all adults over the age of 60 have a certain degree of osteoarthritis, with higher prevalence among women than men. In the Member States of the European Union, the prevalence of osteoarthritis diagnosed varies from 2,8% in Romania to 18,3% in Hungary. [2]. The incidence of knee osteoarthritis in the United States of America is high, thus 10% of men and 13% of women over 60 years of age were diagnosed with knee osteoarthritis.[3]

Osteoarthritis is currently diagnosed by clinical examination but also by image examination such as face and profile radiography, nuclear magnetic resonance, arthrocopy. Currently there are no biomarkers for early detection of osteoarthritis and the treatment starts from pain relief by oral, topical medication or corticosteroid infiltration, viscous solutions and reaching the surgery.[5][6][7]

Because it attacks joint cartilage and a regeneration treatment of osteoarthritis joint cartilage cannot be developed, it is one of the most challenging joint diseases. The pharmacological treatment present is only to reduce pain but with adverse effects of rigor.[9][10]

This sentence is intended to be a first step in analyzing all effects osteoarthritis has on the anatomical integrity of the knee. The sentence is structured in two parts, a general part where basic information on anatomical-clinical details is presented, the diagnosis and therapeutic possibilities of knee osteoarthritis and a special part where scientific research on the ligamental instability in knee osteoarthritis is actually presented. The special part is divided into four research strands. The first part is the clinical evaluation of patients with batch analysis of patients admitted to the hospital and Techirghiol recovery, the second chapter is the study of evaluation scales in osteoarthritis: Scale Womac, Leqesne, Lyshom, IKDC. In the third chapter we see the imaging assessment of osteoarthritis patients that correlate in the following chapter with the clinical evaluation at the knee joint.the last chapter is the assessment of ligamental instability and articulation impairment after specific clinical tests.

OBJECTIVES.

I have chosen this theme to study because osteoarthritis represents one of the world's leading invalidant diseases with a major impact on patient quality of life.[1][2]

Knee Osteoarthritis is first place in joint assignment as an anatomical topography. This disease affects the anatomical structure of the knee with a major clinical impact on the patient.[3]

The purpose of the doctoral thesis is to correlate the clinical-functional elements with the image aspect of the pathology changes that cause instability

Knee Osteoarthritis is first place in joint assignment as an anatomical topography. This disease affects the anatomical structure of the knee with a major clinical impact on the patient.[3]

The purpose of the doctoral thesis is to correlate the clinical-functional elements with the image aspect of the pathology changes that generate the ligamental instability of the osteoarthritis knee and to the recovery therapy using natural therapeutic factors.

The general objective of the thesis doctoral is the demonstration of the effects of medical recovery treatment on the knee with osteoarthritic impairment and the clinical impact it has on the anatomical structure of the knee joint.

Specific objectives of the doctoral thesis are:

dynamic evaluation of clinical changes, functional and imaging of the ligamental knee apparatus affected by osteoarthritis;

clinical evaluation of the impact of the complex medical recovery treatment given in the form of spa nails on the patient with knee arthrosis suffering

dynamic evaluation of pelootherapy on the image aspects of the knee with osteoarthritis impairment;

assessment of the evolution and impact of medical recovery treatment on ligamental stability of the knee with osteoarthritic impairment;

5. assessment of the quality of life of a patient with knee osteoarthritis.

MATERIAL AND METHOD

To achieve the goal and objectives we have carried out a prospective, simple, unenlisted study. The study was carried out in the recovery section II of the spa and Techirghiol breast, where patients diagnosed with knee osteoarthritis admitted between 01.06.2017 and 01.06.2018 were analyzed and examined.

The group to be studied consisted of five dozen (forty-eight women, ten men) patients aged thirty-ninety, and they have carried out three health care internalations, admission that lasted on average twelve days with ten days of complex medical recovery. Patients admitted to the hospital and the reclaim Technirghiol have completed their informed consent for participation in the research study (Annex no 1).

The treatment applied is termoneutrophic balneotherapy with sappelic sludge alternative to concentrated chloruro-sodium water applied in the form of a general sludge bath at 38 ºC, For 20 minutes and a general saline bath at 37 C for 20 minutes; individual or group Kinetotherapy, in the gym or in the water swimming pool heated to 33 C for 30 minutes; wider or local therapy; electrotherapy;

As a method of study, research was based on following the themes of study:

I. Image study - examination of the knee joint using nuclear magnetic resonance.

II. Clinical study - clinical assessment with the scrolling Clinical study - clinical evaluation with following steps: mio-arro-kinetic specialized examination: Joint balance and muscle balance. This is how we have performed the joint flexion and extension balance for all patients examined at both the first admission, six months and one year. Evaluation of static disorders of the valget genum, varum genu, other patella.

III Study of the quality of life of patients with knee osteoarthritis. This step was performed by parentage of assessment scales completed by patients during the three admissions: The WOMAC scale (Western Ontario and McMaster Osteoarthritis Index) (Annex no.2), the Lequesne scale (Annex no.3), the Lyshom scale (Annex no.4), the IKDC scale

IV Clinical study to assess leaching instability in knee osteoarthritis through the leaching specific tests: Lachman test, Lachman reversed, previous setttest, back drawer, Post-side and postero-medial Hughston, Swain test, Valgus stress, Varus stress, Macintosh, Dejour.

V. Clinical trial for assessment by additional tests for determination of articulation impairment in knee osteoarthritis: Mcmuray, Noble, Apley, Brussh test.

RESULTS

Study of ligamental instability in osteoarthritis of genounces- specific tests for ligamental stability

To analyze how patients' health has evolved over time, we have compared their distribution against the outcome of specific tests (positive or negative) in the three evaluations.

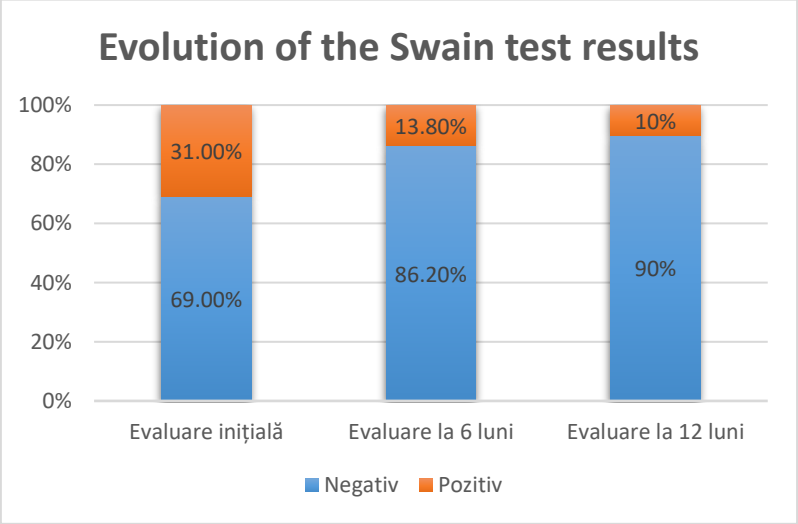
8.5.1 tests of medial stability

For the mid-stability assessment we used the Swain tests and the Valgus stress test.

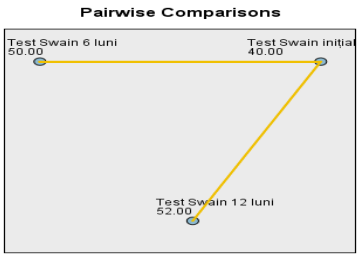
The Swain test

Analyzing the data reveals that the number of patients who have positive results in the Swath test is decreased.

Thus, at the time of the initial assessment, the proportion of patients with a Swain positive was 31%. Following therapy, the six-month assessment has reduced the percentage of Swain positive patients to 13,8%. At the 12-month evaluation, the percentage remained approximately the same, with more than 10% of patients with a Swain positive test (Figure 82).



The Cochran's Q test (Table 34) examined the relationship between the result of the Swain test and the time at which the assessment was made. There is a statistically significant relationship (p0.001). After therapeutic intervention (six-month examination), there is a significant improvement in the health status. It shall be maintained 12 months after the initial assessment. The post-hoc analysis identified that the Swain test differs significantly statistically between the initial assessment and the six-month and one-year (p0,001) assessments. However, between the six-month and 12-month assessment, the observed difference is statistically insignificant (Figure 83).

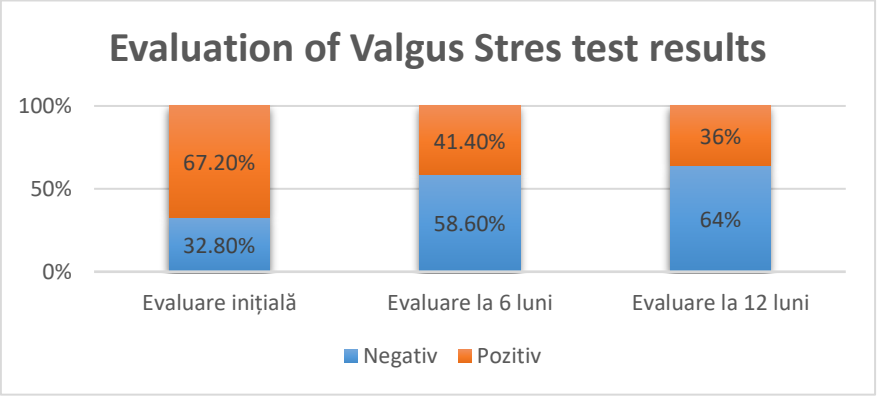


Each node shows the sample number of successes.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Swain inițial-Test Swain 6 luni	-.172	.049	-3.536	.000	.001
Test Swain inițial-Test Swain 12 luni	-.207	.049	-4.243	.000	.000
Test Swain 6 luni-Test Swain 12 luni	-.034	.049	-.707	.480	1.000

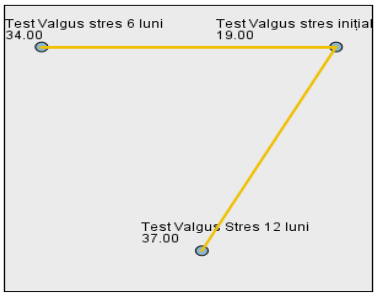
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

At the time of the initial assessment, most patients showed positive results in the Valgus test, 39 out of the total 58 patients included in the study. Proportionally, we have found that the proportion of patients with positive results has decreased significantly, from 67,2% at the time of the initial assessment to 41,4% at the time of the mid-term review, to six months, with this percentage falling further up to 12 months to 36%. (Figure 84).



The differences are statistically significant (p0.001), with an increase in the number of patients with negative results in the stress valgus test. The post-hoc analysis, carried out to determine the statistical significance of the intergroup differences, results in a significant statistical output for the initial six-month and initial 12-month group pairs respectively. There are no significant statistical differences between the six-month assessment and the 12-month evaluation (Figure 85)

Pairwise Comparisons

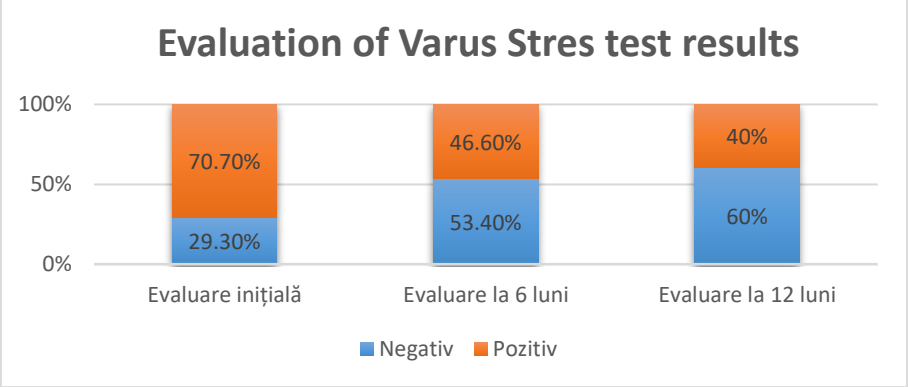


Each node shows the sample number of successes.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Valgus stres inițial-Test Valgus stres 6 luni	-.259	.068	-3.831	.000	.000
Test Valgus stres inițial-Test Valgus Stres 12 luni	-.310	.068	-4.597	.000	.000
Test Valgus stres 6 luni-Test Valgus Stres 12 luni	-.052	.068	-.766	.444	1.000

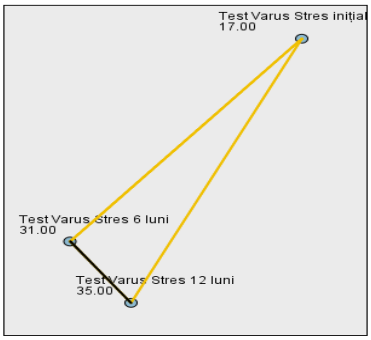
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

At the time of the initial assessment, the use of the Varus stress test resulted in positive results for 41 patients. The number dropped to 6 months to 27, with a further decrease observed in the assessment from 12 months when the number of positive test cases was 23. Proportional changes in the percentage of positive cases are observed from 70,7% in the initial assessment to 39,7% in the 12-month assessment (Figure 24)



The result obtained is statistically significant (p=0,002) so it can be supported with a high degree of certainty that the therapeutic intervention produces beneficial effects 6 months after their application and the benefits are retained 12 months after the first therapy, with the Varus stress test having significantly less positive results

Pairwise Comparisons



Each node shows the sample number of successes.

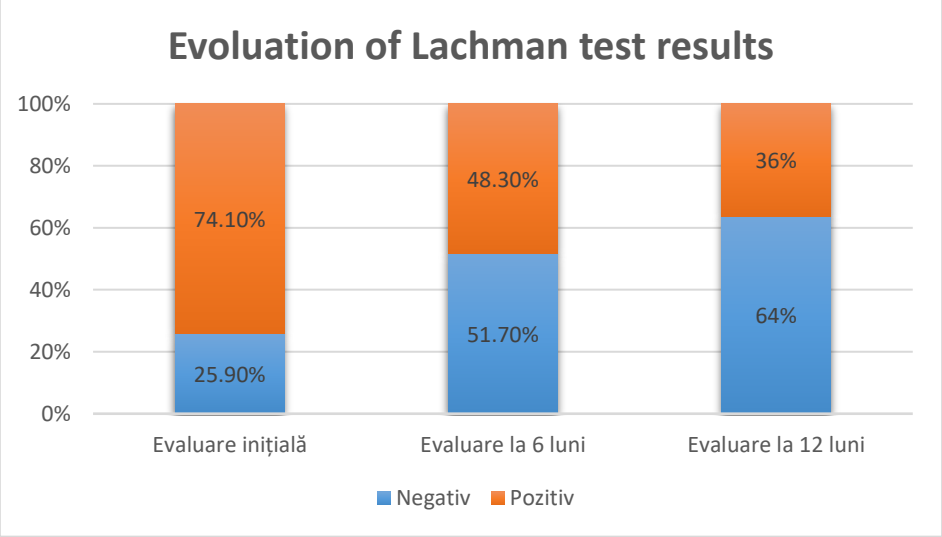
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Varus Stres inițial-Test Varus Stres 6 luni	-.241	.063	-3.834	.000	.000
Test Varus Stres inițial-Test Varus Stres 12 luni	-.310	.063	-4.930	.000	.000
Test Varus Stres 6 luni-Test Varus Stres 12 luni	-.069	.063	-1.095	.273	.820

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

In order to assess the previous knee stability, I used Lachman tests and the previous bin test.

Lachman test

The differences in the three evaluations are observed by increasing the proportion of patients with negative outcomes in the six and 12-month evaluations.



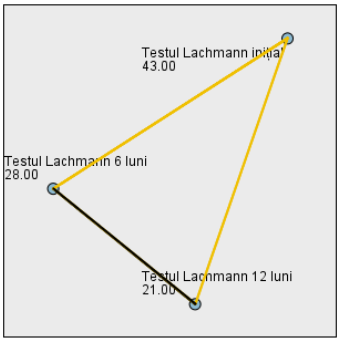
See (Figure 88) a reversal of the proportions between the two patient categories with regard to the Lachman test. If on an initial assessment the proportion of patients with positive results in the Lachman test is 71,1% compared to only 26% of those with negative results, after six months the proportion shall be reversed to 51,7% with negative results, compared to 48,3% with positive result.

After 12 months, the gap is widening to 64% with a negative result, compared to only 36% of those with a positive result.

The results obtained indicate that there are significant statistical differences between the three evaluations (p0,001).

The post-hoc analysis carried out shall identify groups with significant statistical differences. These are initial results that differ significantly statistically from both the six-month interim results and the 12-month final results. There are no significant statistical differences between the interim and final assessment (Figure 89).

Pairwise Comparisons



Each node shows the sample number of successes.

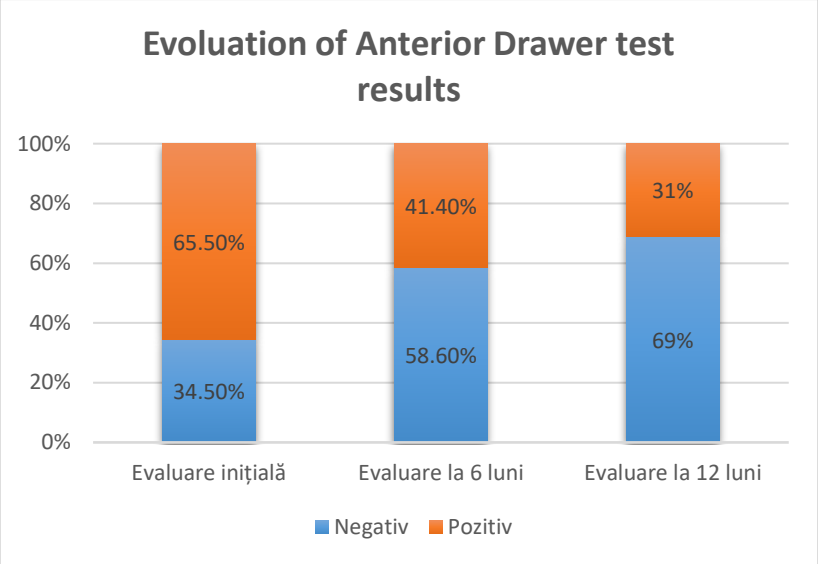
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Testul Lachmann 12 luni-Testul Lachmann 6 luni	.121	.069	1.750	.080	.240
Testul Lachmann 12 luni-Testul Lachmann inițial	.379	.069	5.500	.000	.000
Testul Lachmann 6 luni-Testul Lachmann inițial	.259	.069	3.750	.000	.001

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

89 Post-hoc analysis Lachman test

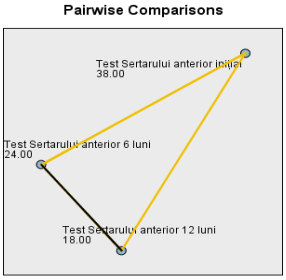
Previous bin test

We also saw a significant decrease in the number of patients with positive results in the previous drawer test, from 38 to 18 at the third assessment



The differences are statistically significant (p=0,001), with the initial assessment associated with the highest proportion of patients with positive results, the six-month evaluation is the one with the lowest proportion of patients with positive results.

The analysis of inter-group differences identified significant statistical differences between the initial and the six-month evaluations and the final assessment (Figure 91).



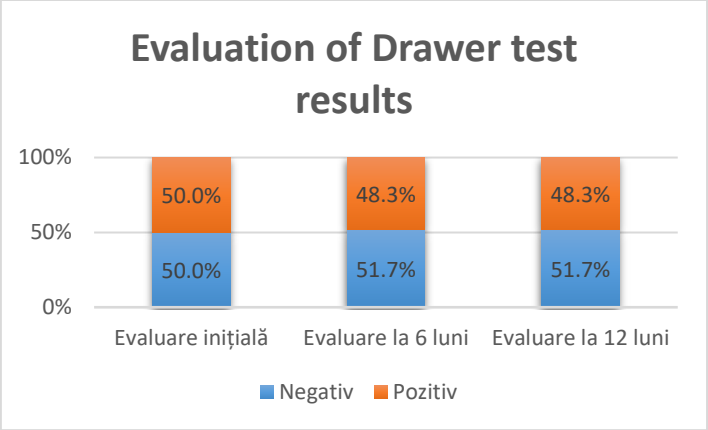
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Sertarului anterior 12 luni-Test Sertarului anterior 6 luni	.103	.066	1.567	.117	.352
Test Sertarului anterior 12 luni-Test Sertarului anterior inițial	.345	.066	5.222	.000	.000
Test Sertarului anterior 6 luni-Test Sertarului anterior inițial	.241	.066	3.656	.000	.001

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

As regards the assessment of back stability, we used the rear bin test and the inverted Lachman test

Rear drawer test

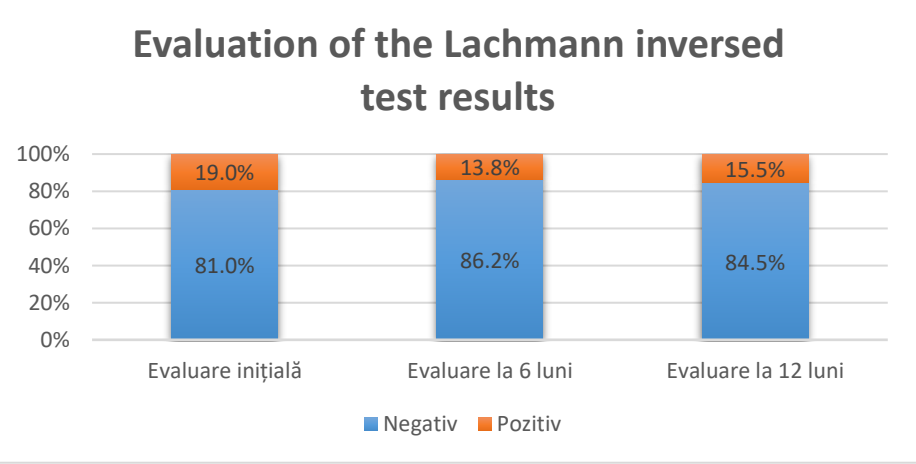
At the initial assessment, 50% of patients showed positive values for the rear bin test. Their proportion was kept relatively constant throughout the study (Table 61)



The observed differences are statistically insignificant (p=1), thus finding that there is no relationship between the post-drawdown test result and the treatment evolution.

Lachman reversed test

The inverted Lachman test, assessing the rear cross-leaching, has shown a positive result, at the time of initial evaluation of 11 patients out of the 58 investigated. The number then dropped to 8 in the mid-term review, to increase to 9 cases in the final assessment. Proportionally, relatively similar proportions are observed, with a slight decrease in the proportion of positive results, which has been maintained for the 12-month evaluation.



Negative results are found to a large extent, with values above 805 in each assessment. It is noted that the differences observed between the assessments are statistically insignificant (p=0,556).

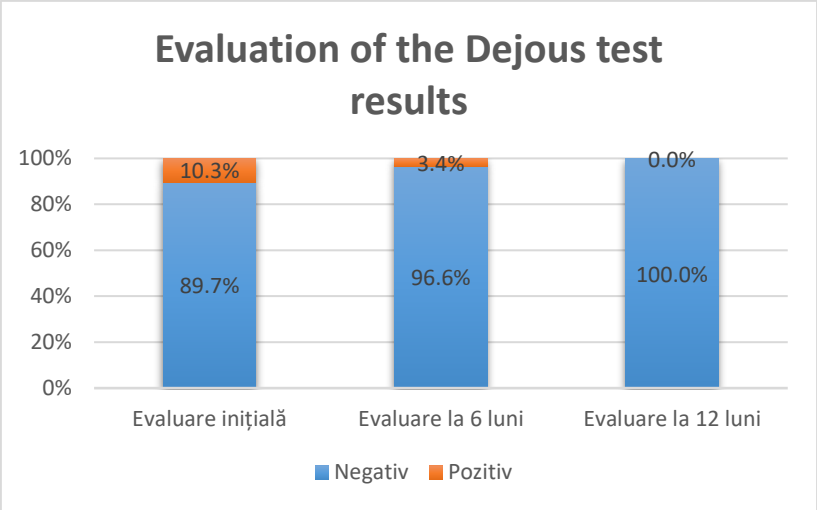
8.5.5 Stability tests with antero-medial rotation

The stability of the antero-medial rotation has been assessed by means of the Dejous test, Macintosh test, postero-medial Hughston and postero-side Hughston test

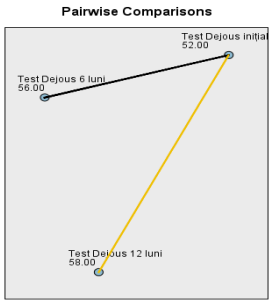
The Dejous test

In the case of the Dejous test, in the initial assessment, six cases with a positive result were identified, with the number falling to 0.

Proportionally, the number of positive cases has decreased to 0%, a observation made in the 12-month evaluation.



The result is statistically significant (p=0,033), with a significant statistical difference between the initial and 12-month evaluation (Figure 95).



Each node shows the sample number of successes.

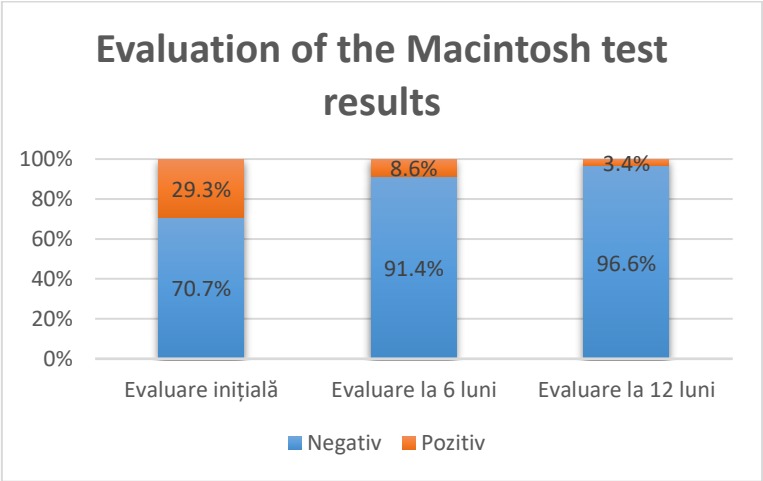
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Dejous inițial-Test Dejous 6 luni	-.069	.040	-1.732	.083	.250
Test Dejous inițial-Test Dejous 12 luni	-.103	.040	-2.598	.009	.028
Test Dejous 6 luni-Test Dejous 12 luni	-.034	.040	-.866	.386	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

Antero-lateral rotation stability test

Macintosh test

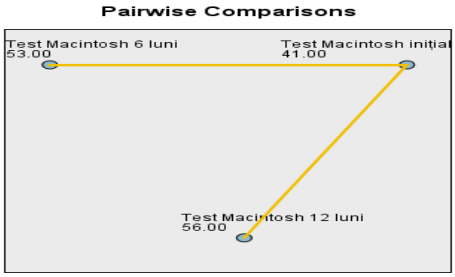
At the initial evaluation, 17 patients showed a positive Macintosh test. The number dropped significantly in the first assessment, with the six-month one to 5, then the 12-month assessment falling to 2 cases (Table 67).



It can be seen that negative results are increasing from 70.7% initially to 91.4% and then to 96.6% after six months and one year respectively.

Statistical analysis of the data reveals a significant statistical difference (p0.001) between the proportion of patients with positive outcomes and the trend over time, i.e. a statistically

significant change in the patient (Table 68).the post-hoc intergroup analysis identified that the result in the initial evaluation differs significantly statistically from the results obtained at the six-month interim evaluation and one-year evaluation (Figure 98



Each node shows the sample number of successes.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Macintosh inițial-Test Macintosh 6 luni	-.207	.055	-3.795	.000	.000
Test Macintosh inițial-Test Macintosh 12 luni	-.259	.055	-4.743	.000	.000
Test Macintosh 6 luni-Test Macintosh 12 luni	-.052	.055	-.949	.343	1.000

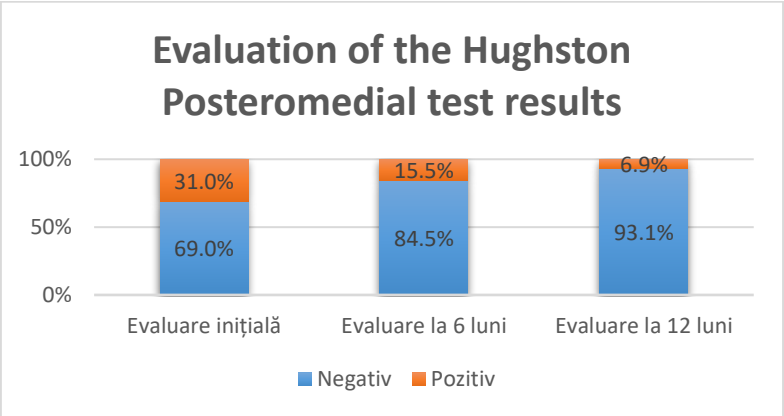
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

Post-medial rotation stability test

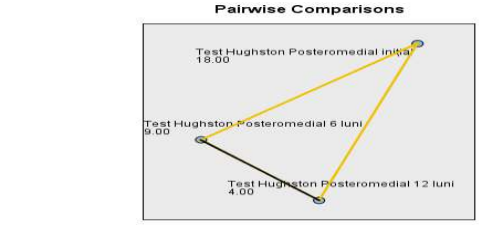
The post-eromedial Hughston test

In the case of the Post-eromedial Hughston test, we have seen a significant decrease in the number of positive patients, from 18 cases at the time of the initial assessment to 4 cases at the 12-month evaluation (Table 69).

Negative results increase from an initial assessment of 69%, to 84% after six months and to 93% after 12 months. Positive results decrease from 31% to 15.5% to 6.9% after 12 months ().



The post-hoc analysis (Figure 100) provides the information necessary to assess the statistical significance of the observed differences between the three possible groups. Thus, we have found that significant statistical differences are between initial and six months and 12 months respectively. Between the six-month and 12-month evaluation, we have not seen any significant statistical differences.



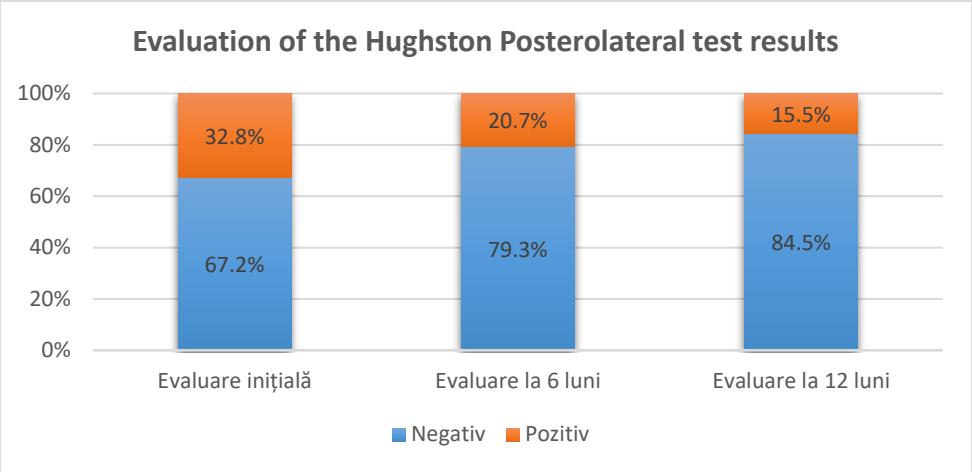
Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Test Hughston Posteromedial 12 luni-Test Hughston Posteromedial 6 luni	.086	.053	1.637	.102	.305
Test Hughston Posteromedial 12 luni-Test Hughston Posteromedial initial	.241	.053	4.583	.000	.000
Test Hughston Posteromedial 6 luni-Test Hughston Posteromedial initial	.155	.053	2.946	.003	.010

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

Postero-lateral rotation stability test

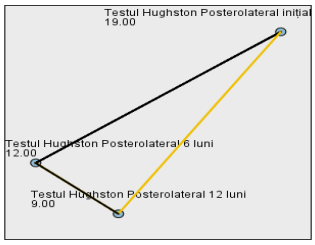
Hughston Posterolateral test

The Hughston Posterolateral test also shows a decreasing trend in the frequency of positive cases, decreasing from 19 in the initial assessment to 9 in the last assessment.32,8% were observed in the initial assessment. This percentage dropped to 20,7% at the six-month review, then dropped to 15,5% at the last review.



The result is statistically insignificant, p=0,002, so the null hypothesis cannot be rejected with a sufficiently high degree of confidence (Tabel71). Between groups, the significant statistical difference is only observed when comparing the results of the initial assessment with those obtained in the final assessment (12 months), in which case adjusted by 0,003. In all other cases, the differences are statistically insignificant, with p adjusted to 0,66 and 0.978 respectively (Figure 102)

Pairwise Comparisons



Each node shows the sample number of successes.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Testul Hughston Posterolateral 12 luni-Testul Hughston Posterolateral 6 luni	.052	.053	.982	.326	.978
Testul Hughston Posterolateral 12 luni-Testul Hughston Posterolateral inițial	.172	.053	3.273	.001	.003
Testul Hughston Posterolateral 6 luni-Testul Hughston Posterolateral inițial	.121	.053	2.291	.022	.066

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

The clinical examination of patients in the study at the hospital and the Technighiol recovery could see and analyze the static disorders of the knee joint so that the varum gene has been found in a major proportion, which has remained unchanged during the three interstays, another one could also be observed in a smaller proportion, a static disorder of the patella which remained unaltered throughout the study period.

The head is a small part of the body. The study found a significant reduction in the presence of edema at the knee joint.

Also, the presence of echimodes in patients in clinical trials is statistically insignificant, with the existence of echimodes in the knee joint in very few numbers.

In the case of the presence of cysts at the point of the popliteus, the baker's cysts have been present in a high number, But after the treatment of their recovery the number dropped significantly in the second admission so that no Baker cyst could be observed in the clinical examination at the third admission.

The joint and muscle balance of the knee joint was performed in clinical examinations. The joint balance test was carried out for flexion and knee extension both at first admission, second admission and third admission. The result of the joint assessment was statistically insignificant, a significant increase in knee bending or a decrease in the knee extension over the three interpatient missions could not be analyzed.

Muscle testing was performed on all patients admitted to the recovery section II of the clinical study in the following muscle groups: quadriceps, ischiogamberi, broad-fascia tenor, sister-jerseys. In the case of the muscle testing of the quadricepip and ischiogambians, a significant increase in muscle force could be observed after the treatment for recovery after the second admission, but especially after the third admission (approximately one year).

In the case of the wide beam muscle testing, a signative increase in muscle force after one year could not be analyzed.

For the muscle testing of the sural tricpPSD a significant increase in muscle force from the first to the third admission has been achieved admission, but with a statistically insignificant result between the first and second admission and between the second and third admission, it shows that the best result for muscle strength was found in patients just a year later.

The anamnesis of patients introduced into the admitted study batch in the recovery section II of the hospital and Techirghiol revealed that the patients diagnosed with the knee osteoarthritis start disease around the age of 50, i come in a percentage hey come in a high

proportion of urban areas and are smokers in 40% of cases, also, 37 % are sedentary and show a degree of obesity present at the time of admission.

The imaging of the cases analyzed revealed that the most common meniscal injury is at the rear horn of the internal meniscus, the injury that we encounter at the internal menisc body level, but as a linear lesion in a lower percentage.

In the image examination, the normal appearance of the previous horn of the external meniscus could be observed in a high percentage. This could be combined with the clinical examination of patients at the boarding site of the hospital recovery section II of the spa and Techirghiol recovery.

From the imaging exam, more frequent affinity could be observed on both the previous third and the entire surface of the internal ligament. While the internal posterior ligament has a lower proportion of ligamental damage process, which is in conjunction with the clinical examination.

It was also observed in the image examination under nuclear magnetic resonance and the ligamental damage of the internal collateral ligament, but in a minor proportion. This ligamental assignment found in the image exam could not be corroborated with the clinical examination of admitted patients

Patients with knee osteoarthritis during magnetic resonance examination showed Baker cysts in a major proportion. These cysts were also observed during the clinical examination of patients at the hospital in Banear and the Technirghiol recovery. After the treatment of recovery, some of the balistic liquid was resorned, which demonstrates the beneficial effects of other treatments applied, only in a small proportion had to be intervened by evacuation puncture. It was also possible to analyze magnetic resonance and presence of a fluid slide at the patho-tendon. This could not be observed in the clinical examination of patients in any of the admissions.

Bone impairment of patients with knee osteoarthritis could also be observed in the examination of magnetic resonance with the presence of bone edema at the external tibial plateau and the proximal metaphysis a you shit. In a small percentage of magnetic resonance examinations, nodules on femoral metaphysis could be observed, this could not be combined with the clinical examination in any case presented at the admission to the department.

The clinical examination at the admission of patients to the recovery section II of the spa and Techirghiol recovery scale was made available to patients the evaluation scales Womac, Ikdc, Lequesne, Lyshom.

This was the case for the Western Ontario and McMaster University Arthritis Index

assessment of the degree of joint rigidity, knee pain and physical function. There is a high improvement in knee articulation function and a considerable decrease in joint pain and stiffness both 6 months and one year after the first boarding in the Technirghiol Snow and Recovery. After the second admission the articular function was kept at the same high level. For the Lequesne knee osteoarthritis severity scale, the patients first admitted have scored their osteoarthritis very severely, following the recovery treatment of both 6 months and 1 year, the score reached a severe score.

In the Lyshom assessment scale, pain, tumefactia at the knee level was analyzed, the degree of mobility of the knee joint and the types of activities the patient can perform. Thus, after 6 months since the first admission, a slight increase in knee articulation mobility and a decrease in tumor and joint pain was observed. An increase in functionality was observed in the lower leg. These results have not increased to 1 year since the first admission.

An assessment scale used to highlight pain, tumor and knee rigidity is the IKDC scale International Kshe documentation Committee form.

This has seen a considerable decrease in the frequency of pain from the first admission to the second admission. During the period between the second and third inpatient the frequency of pain at the knee joint was at the same level.

The IKDC scale also assesses the intensity of the pain patients are presented at admission to the recovery section II of the spa and Techirghiol, the strength of articulation pain that has decreased significantly during the second admission. The drop in intensity could also be observed in the third admission, 1 year after the first admission.

In the case of tumor and knee rigidity, analysis and a clear difference between first and second admission with a considerable decrease in tumor and joint stiffness could be made, but at the third admission this percentage remained at the same level.

In the clinical examination of patients admitted to the hospital and Techirghiol recovery at the first admission, the second admission and one year later on the third admission were used in the examination of patients the ligamental specific tests to determine leagues instability.

Thus, in the case of the medial stability tests, the Swain tests and the Valgus stress test were used. For both tests a significant improvement in the medial stability was observed after the recovery treatment, especially after the second admission six months after the first admission.

The Vous stress test was used to determine the medial stability, in this case, a significant increase in the stability of the second admission could be considered, and hence a slight increase in the third admission.

Lachman test and previous bin test were used to assess the previous stability of the knee. Both the Lachman and the previous drawers test were positive at first admission, but after recovery treatment, it was found that these tests were not relevant after the second and third admission. The posterior slide test and the Lachman reversed test have been used for poststability, tests which have remained positive throughout the period both at first admission and at third admission. The Dejous test and Macintosh test saw an increase in the negativity of the tests from the first admission to the third admission in the admitted study patients in the recovery section II of the breast and Techirghiol recovery.

The Hughston post-media test had a significant increase the negativity of the test from first to second admission, but without an increase between second and third admission, what represented is that the ligamental stability per medial antero rotation remained unaltered.

The post-collateral Hughston test showed slight negative testing growth after the second admission.

Other tests which have been used in the clinical examination of the knee joint are: Mcmuray, Brsh, Noble, Apley.

The Mcmuray test used in all three interpatient admissions had a significant increase in negativity from the second admission, which followed the third admission.

The test The Mcmuray test used in all three interpatient admissions had a significant increase in negativity from the second admission, which followed the third admission.

The Brush test, although used in all admissions in the study, was not statistically significant, too little is the proportion of admitted patients.

The Noble test and the Apley test showed an increase in the negative result after the second admission, but between the second and third admission this increase did not occur.

Conclusions

1. Specific knee examination and assessment with degenerative impairment is based on complex anatomical-functional data that translates into clinical trials.
2. Not all anatomical-pathological changes within knee osteoarthritis can be clinically and imagistic related.
3. The beneficial impact of the treatment of the Bapophysical recovery with therapeutic factors specific to Techirghiol is demonstrated by monitoring the results of the specific assessments after each treatment run.
4. Although the duration of the three treatment series was only ten days, every six months, the positive effect of therapies through specific clinical trials was demonstrated, especially after the second admission.

5. We can appreciate and imagine a targeted assessment method for knee osteoarthritis patient with medio-lateral ligamental instability, antero-posterior, femuro-pathellular, applicable in orthopedic, rheumatology, physical medicine and rehabilitation, ortesia.
6. The functional treatment applied to active stability elements had effects which were specifically highlighted by the analysis of objective evaluation parameters during the three evaluations.
7. Targeted clinical tests may be used to assess how other anatomical structures are involved in knee osteoarthritis.

8. Medical rehabilitation is one of the few medical specialties where the effects of treatment are cumulative on preserving the integrity of anatomical structures involved in degenerative pathology, with the long-term quality of life for this patient category.
9. Much more complex studies are needed on possible changes to joint cartilage and other structures affected in degenerative processes as effects of peloidotherapy, including in stimulating specific tissue regeneration factors.
The originality of the thesis and the innovative contributions of the thesis
This sentence addresses an invalid condition as osteoarthritis with a incidence of 10% of the general population over 60 years The primary location of osteoarthritis is the knee joint that suffers from anatomical integrity.
The work gives a comprehensive statistic for patients with knee osteoarthritis; from the background, sex, the starting age of the disease to the level of co-morbidity and the number of diagnostic criteria.
An important image study was also performed with the demonstration of all lesions encountered at the knee joint, which assessed the impact of osteoarthritis on anatomical elements such as menisces, ligaments, bone structure.
In this study, a large number of assessment scales were carried out on patients with knee osteoarthritis, thus demonstrating the effects this pathology has on quality of life.
The innovative study of this sentence is the specific ligamental tests carried out in patients with knee osteoarthritis, tests that are present only in a clinical examination of patients with trauma lesions not in patients with joint degeneration.
A particular point in this sentence is the quantification of the complex medical recovery treatment made up of three series of treatments spread over 18 months.
They haven't performed studies of patients with knee osteoarthritis with a tilt toward research into ligamental instability.

For the studies to follow, a higher number of cases and a longer period of investigation of the effects of osteoarthritis on the anatomical structure of the knee are desired.

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