DIAGNOSTIC ASSESSMENT IN ANTERIOR CRUCIATE LIGAMENT (ACL) TEARS

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Abstract

The aim of this study was to compare findings from clinical examinations, MRI scans and arthroscopy in ACL injury of the knee in order to assess the diagnostic significance of both examination findings.

This study was conducted to manage the reliability of clinical diagnosis in ACL tear injuries. All patients attending our clinic with knee pain from 2009 to 2013 underwent systematic and thorough clinical assessment. Of 103 patients with knee problems arthroscopy ACL tears was diagnosed in 73. All these patients underwent therapeutic arthroscopic knee surgery. The clinical diagnosis was evaluated and confirmed during this procedure. The accuracy, sensitivity and specificity were calculated based on these arthroscopic findings. The MRI accuracy of clinical diagnosis in our study was 82.5% for ACL tears. Accuracy for two of three clinical examination tests of clinical diagnosis in our study was 96% and 94% for ACL tears. According to our obtained correlation between clinical examinations, MRI scan and arthroscopy for ACL injuries, we concluded that carefully performed clinical examination can give equal or better diagnosis of ACL injuries in comparison with MRI scan.

Our study revealed MRI scan high sensitivity and specificity and not so high accuracy for ACL injuries of the knee joint in comparison with arthroscopy. MRI is an appropriate screening tool for therapeutic arthroscopy, making diagnostic arthroscopy unnecessary in most patients.

According to our findings we can conclude that a positive anterior drawer test and a positive Lachman clinical examination test is more accurate for predicting, i.e. diagnosis of ACL tear. On the ither hand, MRI scan findings showed less accuracy for predicting, i.e. diagnosis of ACL tear. According to many studies of clinical examination tests compared (correlated) with arthroscopy, the accuracy of predicting ACL tears depends on the level of the skilled orthopaedic or trauma surgeon's hands. Based on these findings, we feel that MRI, except in certain circumstances, is an expensive and unnecessary diagnostic test in patients with suspected meniscal and ACL pathology.

Key words: clinical examination test, MRI, arthroscopy, ACL, knee.

Introduction

The knee joint is a common site of injury, mainly due to trauma, repetitive activities and sports activities [1].

Disruption of the anterior cruciate ligament (ACL), a major stabilizer of the knee, leads to loss of stability of the knee and potentially significant dysfunction; although the ACL is the most frequently torn ligament of the knee, the ACL tear has remained clinically elusive. Additionally, ruptures near the insertion of ligaments may be missed and magnetic reso-

nance imaging (MRI) examination reveals an intact ACL. The accuracy, sensitivity and specificity values for knee lesions vary widely in literature [2].

The clinical relevance of MRI, however, is determined in one way by its value in the selection of patients for or exclusion of patients from treatment with therapeutic arthroscopy. This overall assessment of the entire joint, also called a composite diagnosis [3], is more relevant than the accurate diagnosis of all specific lesions of the various anatomical structures.

Determination of the clinical relevance of MRI can be affected by selection bias. Selection criteria for arthroscopy, results of which are used as the reference standard, play a role in most studies and potentially have a major influence on the interpretation of MRI results.

MRI has a better soft tissue contrast and multi-planar slice capability, which has revolutionized and has become the ideal modality for imaging complex anatomy of the knee joint [4].

Evaluation of the ACL should be performed immediately after an injury if possible, but is often limited by swelling and pain. When performed properly, a complete knee examination is more than 80 percent sensitive for an ACL injury. The Lachman test is the most accurate test for detecting an ACL tear [5].

The advanced modality in the management of internal derangement of knee joint is arthroscopy, which can be used in its dual mode, either as a diagnostic and/or as a therapeutic tool. Arthroscopy offers direct visualization of all intra-articular structures with high diagnostic accuracy, the possibility of examining the stability of the knee under anaesthesia and the possibility of performing a therapeutic procedure in the same session [6].

In this study ACL tears were clinically diagnosed by a positive Anterior Drawer Test, Pivot shift test and positive Lachman test. Arthroscopy was used to assess the reliability of clinical diagnosis.

The aim of this study was to compare findings from clinical examinations, MRI and arthroscopy in ACL injury of the knee in order to assess the diagnostic significance of the clinical examinations and MRI findings.

Patients and methods

In our study we involved 103 patients with a history of knee injuries who were admit-

ted to the Clinic of Traumatology, Majka Tereza Clinical Center, Skopje. MRI of the knee joint was done before admission and in some cases before the clinical examination.

Patients were subjected to physical examination involved assessing Anterior Drawer Test, Pivot shift test and positive Lachman test. The major difference between these is the degree of knee flexion (90 degrees in the drawer sign and 20–30 degrees in Lachman). In the **Pivot shift test**, the patient is in a supine position and relaxed or, preferably, given general anaesthesia. While the limb is held in external rotation and the knee in full extension, the lateral tibia is subluxed anteriorly in relation to the femur. This test simultaneously evaluates both rotation and translation of the tibial plateau relative to the femoral condyle.

All clinically diagnosed patients underwent diagnostic and therapeutic knee arthroscopy to assess the accuracy of clinical diagnosis after the required investigations and consent in the Clinic of Traumatology, Majka Tereza Clinical Center, Skopje during the years 2009 and 2013.

However, some patients who had been referred from outside or received treatment and MRI prior to admission to our hospital were considered with same MRI report and not subjected to a fresh MRI investigation.

Images of magnetic resonance were performed with a 1.0-T system (Philips Medical Systems) and a 1.5-T system (Simens Medical System) at the Institute of Radiology in Skopje.

The standardized MR imaging protocol consisted of sagittal, coronal and axial sequences, in a section thickness of 3–5 mm. ACL was considered normal when it appeared as a band of fibres of low to intermediate signal intensity on both sagittal and coronal dual images. The ACL was considered to be completely torn if there was disruption of all fibers or if it was not discernible at all on MRI. For statistical analysis, we considered one group as normal and complete tears and partially torn ligaments as another group.

All arthroscopic procedures were performed in a standard manner by an experienced arthroscopic surgeon, and carried out under regional or general anaesthesia with a tourniquet, using standard anteromedial and anterolateral portals. Additional portals were used when re-

quired. Operative findings were documented in the patient's official document, which included the survey of the entire joint and anatomical structure, lesions involved with the presence or absence of a tear, its location, the status of the articular cartilage and others. The composite data was tabulated and studied for correlation with MRI and clinical examination findings and grouped into four categories:

1. True-positive − if the MRI diagnosis and clinical examination findings were confirmed by arthroscopic evaluation or the clinical examination findings were confirmed by the MRI evaluation.

2. True-negative − when MRI and clinical examination findings were negative for lesion and confirmed by arthroscopy or the clinical examination findings were negative for lesion and confirmed by MRI.

3. False-positive − when MRI and clinical examination findings showed lesion but the arthroscopy was negative or clinical examination findings showed lesion but the MRI was negative.

4. False-negative − result when arthroscopy was positive but the MRI and clinical examination showed negative findings or MRI was positive and clinical examination showed negative findings.

Statistical analysis

Statistical analysis was used to calculate the sensitivity, specificity, accuracy, positive predictive value (PPV) and negative predictive value (NPV), in order to assess the reliability of the MRI results.

Categorical variables were summarised using frequency and were compared using the chi-square or McNemar test as appropriate. A p-value of less than 0.05 was considered to be statistically significant.

Results

The study group of 103 patients consisted of 81 men (79%) and 22 women (21%). All underwent arthroscopic knee surgery. The average age was 29.7 years (range: 16–58 years). The maximum number of patients (n = 34) who suffered knee injuries were in the age group 21–30 years. The right knee was involved in 56 cases (54.4%) and the left knee in 47 (45.6%).

Clinical and MRI diagnostic test characteristics are as follows:

− Sensitivity: how good the test is at detecting an ACL tear.

− Specificity: how good the test is at identifying a normal knee.

− Positive predictive value: how often a patient with a positive test has an ACL tear.

− Negative predictive value: how often a patient with a negative test does not have an ACL tear.

− Accuracy: proportion of test which correctly identifies ACL injuries.

Clinical diagnostic value in ACL injury

Comparison of the arthroscopic and clinical Anterior Drawer test findings yielded the following results. Clinical Anterior Drawer test findings for the ACL yielded 69 true-positives (were confirmed on arthroscopy) and 30 true-negatives (were without evidence of ACL tears) with 4 false positive (were misinterpreted as having ACL tears) and 0 false negative (were not diagnosed clinically) (Tab. 1), (Fig. 1) which resulted in 94.5% sensitivity, 100% specificity, 100% PPV, 89.4% NPV and 96,1% accuracy (Tab. 4).

Table 1

McNemar matching for arthroscopy and anter. drawer test findings in ACL tears

| | Arthroscopy findings in ACL | | |
	Positive findings	Negative findings	Total
Clinical Anter. Drawer test Positive findings	69 (TP)	0 (FP)	**69**
Clinical Anter. Drawer test Negative findings	4 (FN)	30 (TN)	**34**
	73	**30**	103

TP (true positive); TN (true negative); FP (false positive); FN (false negative)

Comparison of the arthroscopic and the clinical Lachman test findings yielded the following results. Clinical Lachman test findings for the ACL yielded 67 true-positives (were confirmed on arthroscopy) and 30 true-negatives (were without evidence of ACL tears) with 6 false positive (were misinterpreted as having ACL tears) and 0 false negative (were not diagnosed clinically) (Tab. 2), (Fig. 1) which resul-

ted in 91.7% sensitivity, 100% specificity, 100% PPV, 85.7% NPV and 94.1% accuracy (Tab. 4).

false positive (were misinterpreted as having ACL tears) and 1 false negative (were not diagnosed clinically) (Tab. 3), (Fig. 1) which resulted in 62.1% sensitivity, 98.2% specificity, 97.7% PPV, 67% NPV and 71.8% accuracy (Tab. 4).

Table 2

McNemar matching for arthroscopy and Lachman test findings in ACL tears

	Arthroscopy findings in ACL		
	Positive findings	Negative findings	Total
Clinical Lachman test Positive findings	67 (TP)	0 (FP)	**67**
Clinical Lachman test Negative findings	6 (FN)	30 (TN)	**36**
	73	**30**	103

TP (true positive); TN (true negative); FP (false positive); FN (false negative)

Clinical Pivot shift test findings for the ACL tears yielded 45 true-positives (were confirmed on arthroscopy) and 29 true-negatives (were without evidence of ACL tears) with 28

Table 3

McNemar matching for arthroscopy and Pivot Shift test findings in ACL tears

	Arthroscopy findings in ACL		
	Positive findings	Negative findings	Total
Clinical Pivot Shift test Positive findings	45 (TP)	1 (FP)	**46**
Clinical Pivot Shift test Negative findings	28 (FN)	29 (TN)	**57**
	73	**30**	103

TP (true positive); TN (true negative); FP (false positive); FN (false negative)

Table 4

Reliability of clinical examination tests findings v. arthroscopy for ACL tears

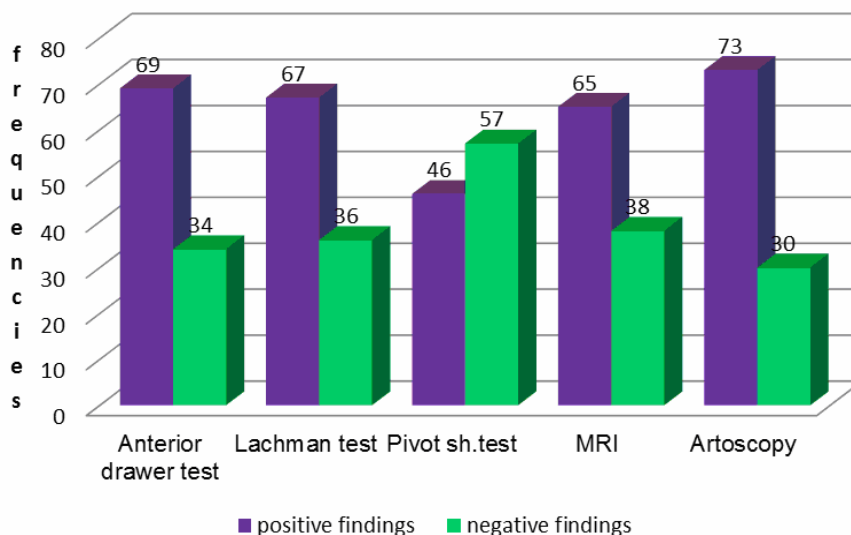| Arthroscopy	Anterior Drawer Test (%)	Lachman Test (%)	Pivot shift Test (%)	MRI (%)
Sensitivity	94.5	91.7	62.1	83
Specificity	100	100	98.2	88.3
Positive predictive value (PPV)	100	100	97.8	93
Negative predictive value (NPV)	89.4	85.7	67	74.5
Accuracy	96.1	94.1	71.8	82.5

Figure 1 – Clinic and MRI versus Arthroscopy findings in ACL of the knee

The McNemar test showed that $x^2 = 1,265$; DF = 1, p > 0.05, i.e. there are no statistically significant differences in distribution of frequencies in positive and negative findings of **ACL** tears in the Anterior Drawer clinical examination test and arthroscopy or a perceived difference is not statistically significant and **they match among themselves.**

The McNemar test showed that $x^2 = 2,041$, DF = 1, p > 0.05, i.e. there are no statistically significant differences in distribution of frequencies in positive and negative findings of **ACL** tears in the Lachman clinical examination test and arthroscopy or a perceived difference is not statistically significant and **they match among themselves.** On the other hand, we found a statistically significant difference in distribution of frequencies in positive and negative findings of **ACL** tears in the Pivot Shift clinical examination test and arthroscopy ($x^2 = 20,021$ DF = 1, p < 0.01) (Fig. 2) or a perceived difference is statistically significant and **they do not match among themselves.**

**Mri diagnostic value
in ACL injury**

Comparison of the **arthroscopic and MRI findings** yielded the following results.

MRI findings for the ACL yielded 60 true-positives (confirmed on arthroscopy) and 25 true-negatives (without evidence of ACL) with 5 false positive (misinterpreted as having ACL) and 13 false negative (were not diagnosed clinically) (Tab. 5), (Fig. 2), which resulted in 83% sensitivity, 88.37% specificity, 93% positive predictive value, 74.5% negative predictive value and 82.5% accuracy (Tab. 4).

Table 5

*McNemar matching for arthroscopy and MRI findings
in ACL tears*

	Arthroscopy findings in ACL		
	Positive findings	Negative findings	Total
MRI Positive findings	60 (TP)	5 (FP)	**65**
MRI Negative findings	13 (FN)	25 (TN)	**38**
	73	**30**	103

TP (true positive); TN (true negative);
FP (false positive); FN (false negative)

The McNemar test showed that $x^2 = 3.55$, DF = 1, p > 0.05, i.e. there are no statistical differences in distribution of frequencies in positive and negative patients with MRI and arthroscopy or a perceived difference is not statistically significant and **they match among themselves.**
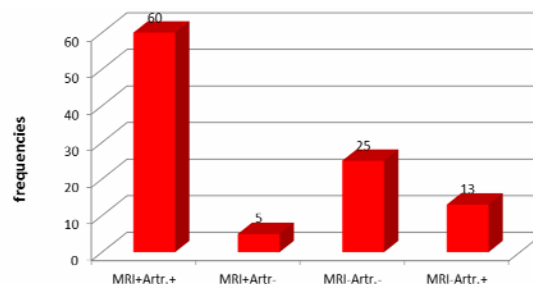

*Figure 2 – MRI and Arhroscopy findings in ACL
of the knee with Mcnemar test*

Comparison of the **MRI findings and clinical "Anterior drawer test"** findings yielded the following results. Clinical Anterior Drawer test findings for the ACL yielded 59 true-positives (confirmed on MRI) and 28 true-negatives (without evidence of ACL tears) with 10 false positive (misinterpreted as having ACL tears) and 6 false negative (were not diagnosed clinically) (Tab. 6), which resulted in 100% sensitivity, 100% specificity, 94% PPV, 94% NPV and 100% accuracy (Tab. 9).

Table 6

*McNemar matching for MRI and anter drawer test
findings in ACL tears*

	MR findings in ACL		
	Positive findings	Negative findings	Total
Clinical Anter. Drawer test Positive findings	59 (TP)	10 (FP)	**69**
Clinical Anter. Drawer test Negative findings	6 (FN)	28 (TN)	**34**
	65	**38**	103

TP (true positive); TN (true negative);
FP (false positive); FN (false negative)

Comparison of **MRI findings and clinical Lachman test** findings yielded the following results. Clinical Lachman test findings for the ACL yielded 58 true-positives (confirmed on arthroscopy) and 29 true-negatives (without

evidence of ACL tears) with 9 false positive (misinterpreted as having ACL tears) and 7 false negative (were not diagnosed clinically) (Tab. 7), which resulted in 100% sensitivity, 50% specificity, 92% PPV, 100% NPV and 92% accuracy (Tab. 9).

Table 7

McNemar matching for MRI and Lachman test findings in ACL tears

	MRI findings in ACL		
	Positive findings	Negative findings	Total
Clinical Lachman test Positive findings	58 (TP)	9 (FP)	**67**
Clinical Lachman test Negative findings	7 (FN)	29 (TN)	**36**
	65	**38**	103

TP (true positive); TN (true negative); FP (false positive); FN (false negative)

MRI findings and clinical "Pivot shift" test for ACL tears yielded 42 true-positives (confirmed on MRI) and 34 true-negatives (without evidence of ACL tears) with 4 false positive (misinterpreted as having ACL tears) and 23 false negative (were not diagnosed clinically) (Tab. 8), which resulted in 50% sensitivity, 99% specificity, 97% PPV, 62% NPV and 43% accuracy (Tab. 9).

The McNemar test showed that x^2 = 10,345; DF = 1, p < 0.01, i.e. there are statistically significant differences in distribution of frequencies in positive and negative findings of **ACL** tears in the Anterior Drawer clinical examination test and MRI findings or a perceived difference is statistically significant and **they do not match among themselves.**

Table 8

McNemar matching for MRI and pivot shift test findings in ACL tears

	MRI findings in ACL		
	Positive findings	Negative findings	Total
Clinical Pivot Shift test Positive findings	42 (TP)	4 (FP)	**46**
Clinical Pivot Shift test Negative findings	23 (FN)	34 (TN)	**57**
	65	**38**	103

TP (true positive); TN (true negative); FP (false positive); FN (false negative)

Table 9

Reliability of clinical examination tests findings v. MRI for ACL tears

MRI	Anterior Drawer Test (%)	Lachman Test (%)	Pivot shift Test (%)
Sensitivity	100	100	50
Specificity	100	50	99
Positive predictive value (PPV)	94	92	97
Negative predictive value (NPV)	94	100	62
Accuracy	100	92	43

The McNemar test showed that x^2 = 9, DF = 1, p < 0.01, i.e. there are statistically significant differences in distribution of frequencies in positive and negative findings of **ACL** tears in the "Lachman" clinical examination test and MRI findings or a perceived difference is statistically significant and **they do not match among themselves.** On the other hand, we found no statistically significant difference in distribution of frequencies in positive and negative findings of **ACL** tears in the Pivot Shift clinical examination test and MRI findings (x^2 = 0.64, DF = 1, p > 0.05) (Fig. 2) or a perceived difference is not statistically significant and **they match among themselves.**

Discussion

The purpose of this study was to assess the reliability of clinical diagnosis in ACL tear injuries. In the study we evaluated 103 patients with a history of knee injuries who were admitted to the Traumatology Clinic in Skopje.

The age group ranged from 16 to 58 years. The youngest male patient was aged 16 years and the oldest female was 58 years. This showed that there was a tendency of males being injured and being operated on at an earlier age. A study done by Avcu et al. [7] showed males are more likely to suffer knee injuries since they are active in sports and the right knee is more frequently injured than the left.

The three most accurate tests for detecting an ACL tear are the Lachman test (sensitivity of 60 to 100%; mean 84 percent), the anterior drawer test (sensitivity of 9 to 93%; mean 62%), and the pivot shift test (sensitivity of 27 to 95%; mean 62%) [8].

We obtained 96% sensitivity, 100% specificity, 100% PPV and 89,4% NPV from the Anterior Drawer clinical examination test with respect to fair correlation with arthroscopy in ACL tears.

Identification of ACL tear in **our study** was presented with a 96% accuracy of the anterior drawer clinical examination test and a 94% accuracy of the Lachman test correlated with arthroscopy, belonging together in the range of a very high accuracy group according to many studies of anterior drawer and Lachman clinical examination tests predicting ACL tears.

For the Lachman clinical examination test we obtained 92% sensitivity, 100% specificity, 100% PPV and 86% NPV compared with arthroscopy in diagnostic ACL tears.

Identification of ACL tears in our study presented with the Pivot Shift clinical examination test was obtained with 72% accuracy, and correlated with arthroscopy was ranged in the very good accuracy group. According to many studies of clinical examination tests compared (correlated) with arthroscopy, the accuracy of predicting ACL tears depends on the level of skill of the orthopaedic surgeon's hands.

For the ACL tears in our study we obtained 62% sensitivity, 98% specificity, PPV 98% and NPV 67% from the Pivot Shift clinical examination test in comparison with arthroscopic findings.

*Rubin et al. [9] reported 93% sensitivity for MRI of isolated ACL tears. Similarly several prospective studies have shown a sensitivity of 92–100% and specificity of 93–100% for the MR imaging diagnosis of ACL tears [10].

In **our study** we obtained 83% sensitivity and 88.37% specificity, PPV 93% and NPV 74.5% of MRI with respect to fair correlation with arthroscopy in diagnosing ACL tears. Identification of ACL tears in our study was presented with 82.5% accuracy from MRI, ranged in the very good, (80–90%) interpretation group. The results of this study are in accordance with the literature which suggests an accuracy of 80 to 94% for cruciate ligament tears [11].

Meta-analysis by Oei and colleagues [12] combined 29 studies from 1991 to 2000 that evaluated the validity of MRI with respect to meniscal and cruciate ligament disorders of the knee.

There is no doubt that the radiologist's experience and training are very important factors in the interpretation of MRI. At the same time, reliable statistical data of the diagnostic value of the MRI are also related to the independent base of reference. Regarding knee MRI, in most of the studies and in our study as well the base of reference is arthroscopy [13, 14]. This presupposes that arthroscopy is 100% accurate and allows for the diagnosis of every possible knee pathology. Arthroscopy is a technically demanding procedure and the results vary according to the surgeon's experience, especially in difficult cases.

MRI is the most helpful diagnostic technique. The reported accuracy for detecting tears of the ACL ranged from 70–100% [15].

*Rose and Gold found the clinical examination to be correct more often than MRI diagnosis. They found no significant difference in accuracy between clinical examination and MRI in both medial and lateral meniscal tears or in anterior cruciate ligament (ACL) tears [16].

We obtained 100% sensitivity, 100% specificity, 94% PPV and 94% NPV from the Anterior Drawer clinical examination test with respect to fair correlation with MRI scans in ACL tears.

The comparison of diagnostic methods in ACL tears, in **our study** was presented with a 100% accuracy of anterior drawer clinical examination test and 92% accuracy of the Lachman test correlated with MRI findings, belonging together in the range of the very high accuracy group according many studies.

For the Lachman clinical examination test we obtained 100% sensitivity, 50% specificity, 92% PPV and 100% NPV compared with MRI scans in diagnostic ACL tears.

Identification of ACL tears in our study presented with the Pivot Shift clinical examination test was obtained with 43% accuracy, and correlated with MRI scans were ranged in a low accuracy group. According to many studies of clinical examination tests compared (correlated) with MRI scans, the accuracy of predicting ACL tears depends on the level of skill of the orthopaedic surgeon's hands.

For the ACL tears in our study we obtained 50% sensitivity, 99% specificity, PPV 97% and NPV 62% from the Pivot Shift clinical examination test in comparison with MRI scans.

Kocabey et al. stated that clinical examination is as accurate as MRI in the skilled ortho-

paedic surgeon's hands and MRI should be reserved for more complicated and confusing cases [17]. Bohnsack et al. also concluded that an experienced examiner can diagnose adequately by clinical examination alone [18].

Regarding clinical knee examination findings and MRI, in most of the studies and in our study as well, the base of reference is arthroscopy [13, 20]. This presupposes that arthroscopy is 100% accurate and allows for the diagnosis of every possible knee pathology.

Arthroscopy should be considered a diagnostic aid used in conjunction with a good history, complete physical examination and appropriate radiographs. With increased proficiency in the examination of extremities and more accurate adjuvant tests, including MRI, we rarely perform simple "diagnostic arthroscopy". Surgical alternatives are discussed thoroughly with the patient before the procedure, and the definitive surgical procedure is performed at the time of an arthroscopic examination.

Conclusion

According to our findings we can conclude that a positive Anterior Drawer test and a positive Lachman clinical examination test are more accurate for predicting, i.e. diagnosis of ACL tear. On the other hand, MRI scan findings showed less accuracy in predicting i.e. diagnosis of ACL tear. According to many studies of clinical examination tests compared (correlated) with arthroscopy, the accuracy of predicting ACL tears depends on the level of skill of the orthopaedic surgeon's hands.

MR imaging in our study revealed high sensitivity and specificity and very good accuracy for ACL injuries of the knee joint in comparison with arthroscopy. The findings in this small-scale study of our population are consistent with larger studies in the field. So we have sufficient evidence to conclude that MRI is highly accurate in the diagnosis of ACL. Many studies, however, have shown that MRI has a variable accuracy in predicting ACL tear configuration found at arthroscopy and depend, with developing advances in technology, on MRI systems.

MRI is an appropriate screening tool for therapeutic arthroscopy, making diagnostic arthroscopy unnecessary in most patients.

Magnetic resonance imaging is an accurate and non-invasive modality for the assessment of ligamenteous injuries. It can be used as a first line investigation in patients with soft tissue trauma to knee.

By obtaining the correlation between clinical examination, MRI scan and arthroscopy for ACL injuries,we conclude that carefully performed clinical examination can give an equal or better diagnosis of ACL injuries in comparison with an MRI scan. An MRI scan may be used to rule out such injuries rather than to diagnose them; when clinical signs and symptoms are inconclusive, performing an MRI scan is likely to be more beneficial in avoiding unnecessary arthroscopic surgery.

When clinical diagnosis is in favour of ACL injuries, performing an MRI scan prior to arthroscopic examination is unlikely to be of significance. MRI scanning should not be used as a primary diagnostic tool in ACL injuries. Bypassing MRI scans and performing arthroscopic examination in suspected cases will be helpful in providing earlier treatment of the condition. Based on these findings, we feel that MRI, except in certain circumstances, is an expensive and unnecessary diagnostic test in patients with suspected meniscal and ACL pathology.

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Р е з и м е

ДИЈАГНОСТИЧКА ПРОЦЕНА ПРИ ЛЕЗИЈА НА ПРЕДНИОТ ВКРСТЕН ЛИГАМЕНТ

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Целта на оваа студија беше да се споредат наодите од клиничките испитувања, магнетната резонанца (МР) и артроскопијата при повреда на предниот вкрстен лигамент (ПВЛ) во коленото за да се процени дијагностичкото значењето на секој од наведените наоди.

Оваа студија беше спроведена за да се анализира веродостојноста на клиничката дијагноза кај повредите на ПВЛ. Сите пациенти кои се вклучени во студијата се јавиле на нашата клиника со болки во коленото во периодот од 2009 до 2013 година и биле подложени на темелно клиничко иследување. Од 103 пациенти со проблеми во коленото, кај 73 артроскопски беше потврдена повреда на ПВЛ. Пациентите беа подложени на терапевтска артроскопска оперативна интервенција на коленото и клиничката дијагноза беше потврдена за време на оваа постапка. Точноста, сензитивноста и специфичноста беа пресметани врз основа на овие артроскопски наоди. Точноста на МР при поставување на клиничката дијагноза во нашата студија беше 82,5% за лезија на ПВЛ. Студијата покажа висока сензитивност и специфичност и добра точност за повредите на ПВЛ, во споредба со артроскопските наоди. Точноста на два од трите клинички теста за преглед на повреден ПВЛ и поставување точна дијагноза во нашата студија беше со висина од 96% и 94%. Со споредување на тестовите за клинички испитувања, наодите од МР и артроскопијата за повреди на ПВЛ, можеме да

заклучиме дека внимателно изведен клинички преглед може да даде еднаква или подобра дијагноза за повреден ПВЛ во споредба со наодот од МР.

Магнетната резонанца (МР) е соодветна скрининг-алатка за индицирање терапевтска артроскопија, што ја прави дијагностичката артроскопија непотребна кај повеќето пациенти. Магнетната резонанца е точна и неинвазивна метода за оценување лигаментарни повреди во коленото.

Нашата студија откри дека наодите од МР се со висока сензитивност и специфичност и добра точност за ПВЛ-повреди на коленото во споредба со артроскопијата. МР е соодветна скрининг-алатка за терапевтска артроскопија, што ја прави дијагностичката, артроскопија непотребна кај повеќето пациенти.

Според нашите сознанија, можеме да заклучиме дека позитивен тест на предна фиока и позитивен Lachman-ов тест се со поголема точност на предвидување, односно дијагностицирање за лезија на ПВЛ. Напротив, МР-наодите покажале помалку точност за предвидување, односно дијагностицирање на ПВЛ-лезија. Според многу студии за испитување на клиничките тестови споредено (корелирано) со артроскопијата, точноста на предвидувањето кај ПВЛ-повреда зависи од нивото на вештината за преглед кај ортопедски или кај траума-хирург. Врз база на овие наоди, сметаме дека МР, освен во посебни услови, е скап и помалку неопходен дијагностички тест кај пациентите со суспектна лезија на менискуси и ПВЛ.

Клучни зборови: клинички тестови, МР, артроскопија, ПВЛ, колено.