

Accuracy of McMurry's Test in Diagnosis Meniscal Tears

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ABSTRACT

Introduction: Meniscal tears in knee joint are of utmost importance to be treated as these injuries not only hamper the quality of life but also lead to unrepeatably degenerative changes in the menisci which ultimately result in knee arthritis. Early diagnosis and treatment is necessary to avoid long term complications of these injuries. Certain clinical tests including McMurry's test along with MRI knee joint aid in the diagnosis of these injuries but currently arthroscopic examination is the gold standard.

Method: This prospective, cross-sectional was conducted in the department of Orthopedics, Khyber Teaching Hospital, Peshawar from Jan, 2020 to Dec, 2021, including 162 patients with suspected meniscal knee injuries. All the patient were evaluated by McMurry's test followed by arthroscopy of the affected knee joint for diagnosis of meniscal tears.

Result: Among 162 patients, 110 (67.90%) were males and 52 (32.10%) were females. The age ranged from 15 to 50 years. Most of the patients (105, 64.81%) were below 30 years of age. The mean age was 30.55 ± 8.13 years. McMurray's test was having sensitivity of 56.8% and specificity of 78.66% for medial meniscal tears while it had sensitivity of 67.70% and specificity of 86.33% for lateral meniscus tears.

Conclusion: McMurray's test is beneficial if used for the screening purpose for meniscal knee injuries.

Keywords: arthroscopy, diagnostic accuracy, McMurray's test, meniscus tear

INTRODUCTION

The knee joint is having pivotal role in locomotion, functional ability and sports activities. It is one of the most common joints affected by trauma which leads to various types of knee injuries. This trauma range from soft tissue injuries to bone fractures. In soft tissue injuries meniscal tears are the of utmost importance and may lead to irreversible damage.^{1,2} Early diagnosis to guide appropriate intervention is necessary for the treatment of these injuries.³

Meniscus injuries are increasing day by day as a result of more people involving in sports and other similar activities. The annual incidence of these injuries is 60-70 per 100,000 persons.⁴ Any delay in timely intervention may lead to irreparable loss of articular cartilage and hence irreversible damage to knee joint.^{5,6}

Injured meniscus causes enough pain to disturb daily living activities. Meniscal injuries may be acute traumatic or degenerative. Acute traumatic meniscal injuries most commonly occur in sportsmen and athletes. It is characterized by knee swelling and intense pain and inability to bear weight on injured leg. The most common mechanism is a twisting injury of knee. The swelling and pain is relieved with passage of time. Intermittent locking, catching, intermittent pain or difficulties in knee bending are the main symptoms in patients who are late presenters. Degenerative tears are mainly found in old age population. These type of meniscal injuries present with an insidious onset.⁷

These injuries can be provisionally diagnosed by history taking and physical examination but this type of diagnosis needs further confirmation through MRI and ideally arthroscopy as clinical feature of meniscal injuries

are vague and many other conditions of knee can also produce the type of features.^{8,9} Magnetic resonance imaging is a very good investigation for diagnosing meniscal injuries with diagnostic accuracy of 72% to 98%.⁴ MRI is having high cost and not easily available everywhere. Moreover it is operator and technology dependent.^{10,11} Arthroscopy is another diagnostic tool with excellent accuracy but it is a surgical procedure.¹² So, a number of clinical tests are in use to rule out and diagnose meniscal knee injuries. Some of these clinical tests are provocative ones. McMurry's test is one of these tests. It is the most commonly performed noninvasive test. A number of studies have been conducted to know the diagnostic value of McMurry's test but its reliability is still questionable.^{13,14}

The current study aims to know the diagnostic accuracy of McMurry's test in meniscal knee injuries in the form of sensitivity and specificity keeping arthroscopic findings as gold standard.

MATERIAL AND METHODS

This prospective cross-sectional was conducted in the department of Orthopedics, Khyber Teaching Hospital, Peshawar from Jan, 2020 to Dec, 2021, including 162 patients with suspected meniscal knee injuries. All the patients presented with knee trauma and suspected meniscal injuries of age 15 to 50 years with more than six weeks of presentation were included in the study by admitting them in the orthopedic ward. All the patients was informed about the study and surgical procedure (arthroscopy) followed by an informed written consent. Patients with previous knee surgery, knee infection, any type of arthritis in the affected knee or those not willing to

participate in the study were excluded. All the patients were properly examined and investigated after taking of clinical history. Examination included McMurray's test. This test was considered positive for medial or lateral meniscus if a palpable or audible click was felt by the examiner in the medial or lateral knee joint line or pain in the medial or lateral knee joint line respectively, was experienced by the patient while bring the knee joint from full flexion to full extension passively by the examiner. For valgus or varus stress was applied to knee for lateral and medial meniscal injuries testing respectively. Clinical finding of McMurray's test were noted. All the patients were examined by a single consultant orthopedic surgeon. All the patients were advised hamstring strengthening exercises for 6 weeks followed by arthroscopy of the affected knee to confirm the examination findings plus minus therapeutic intervention for the concerned pathology. Any breach in the meniscal structure seen on arthroscopy was considered meniscal injury. Findings of arthroscopic examination were noted.

The data obtained from clinical examination and arthroscopic examinations were recorded on a proforma. SPSS version 23 was used to calculate to analyze the data. 2x2 table (Table No. 1) were used to calculate sensitivity and specificity of McMurray's test.

Table 1: sensitivity and specificity of McMurray's test

McMurray's test results		Arthroscopy results	
		+	-
+	A	B	
-	C	D	

A = True positive, B = False positive, C = False negative, D = True negative

Sensitivity = $A/(A+C) \times 100$ Specificity = $D/(B+D) \times 100$

RESULTS

Among 162 patients, 110 (67.90%) were males and 52 (32.10%) were females. The age ranged from 15 to 50 years. Most of the patients (105, 64.81%) were below 30 years of age. The mean age was 30.55 years with standard deviation of 8.13. Out of 162 patients 155 (95.68%) were having history of trauma to knee joint. In 85 patients (52.47%) right knee was involved while in 77 patients (47.53%) left knee was involved. 100 (61.72%) out of 162 patients were having medial meniscus tears while 45 (28.85%) patients were having lateral meniscus tears. 17 (10.49%) patients were having no meniscal tears. 3 (1.85%) of these patients were having Anterior Cruciate Ligament (ACL) tears, simulating meniscal tear, while 15 of the patients (8.64%) were normal.

McMurray's test was having sensitivity of 56.8% and specificity of 78.66% for medial meniscal tears while it had sensitivity of 67.70% and specificity of 86.33% for lateral meniscus tears.

DISCUSSION

In this study, the age ranged from 15 to 50 years and most of the patients were below 40 years. In study by Thakur AK et al, the age of the patients ranged from 17 to 59 years and most of the patients were below 40 years of age.⁴ The same observations can be found in similar other studies.¹⁵⁻¹⁷ The obvious reason this age involvement in meniscal

tears is that sports and athletics activities are more commonly occur in this age group.

In this study, 67.90% of the patients were males and 32.10% were females. Other similar studies are also having male patient's predominance. It possibly may be due to male gender greater participation in sports and other such activities.^{18,19}

In this study the most affected site was right knee. Similar observations are found in similar other studies.^{10,11}

In this study 1.85% patients were having Anterior Cruciate Ligament (ACL) tears, simulating meniscal tear, while 8.64% patients were having normal knee joint anatomy. Thakur AK et al, in their study found that 6.25% patients were suffering from ACL injury simulating meniscal and 3.125% of patients were having normal knee joints. injury.⁴

In this study McMurray's test was having sensitivity of 56.8% and specificity of 78.66% for medial meniscal tears while it had sensitivity of 67.70%, specificity of 86.33% for lateral meniscus tears. In a similar study, Gupta Y et al found that McMurray's is having sensitivity and specificity of 54% and 79% for diagnosing medial meniscus tear respectively.²⁰ Krakowski P et al showed that it has a sensitivity of 65% and specificity of 83% for lateral meniscal tears.⁹ Thakur AK et al concluded that McMurray's test had a sensitivity of 88.88% and specificity of 71.43% for medial meniscal tears while it had a sensitivity of 90% and a specificity of 90.1% for lateral meniscal tears.⁴ This variations in results of different sties shows that McMurray's test is operator dependent and different examiners are having different results for meniscal tears.

CONCLUSION

The findings of our study showed that McMurray's test was a reliable for screening meniscus tears compared to arthroscopy and it can be safely used as first line screening test. However, all the positive cases should be further confirmed by MRI or arthroscopy.

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