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Original Research Article

Assess Clinical Improvement Regarding Joint Line Tenderness and Childress' Test (Duck Walk Test) after Arthroscopic Partial Meniscectomy in a Tertiary Care Hospital

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Abstract: ***Background:*** Clinical weight bearing provocation tests, like to determine the sensitivity and specificity of the childress' test (duck walk test) and joint line tenderness in diagnosing meniscal tears and to determine whether the location of tear and severity of injury is important. However, evidence of the diagnostic accuracy of the childress' test (duck walk test) and joint line tenderness test are lacking and the cause of tear (traumatic versus degenerative), and ACL insufficiency were associated with differences in the sensitivity and specificity of the test. ***Objectives:*** The aim of this study was to assess the clinical improvement regarding joint line tenderness and childress' test (duck walk test) in a tertiary care hospital. ***Methods:*** This is a prospective interventional study. The study used to be carried out in the admitted patient's Department of Orthopedic, National Institute of Traumatology and Orthopedic Rehabilitation (NITOR) Sher-E-Bangla Nagar, Dhaka, Bangladesh. In Bangladesh for the duration of the period from January 2013 to December 2014. ***Results:*** This study conducted on 20 patients aged 16 to 40 years, Childress test (Duck walk test) was positive in case of 80% patients and post operatively the test became negative in all patients Out of 20 patients 90% regained normal to near-normal knee function and stability after surgery. Pain and swelling were also significantly reduced. ***Conclusions:*** Meniscus injury frequently takes place in young adult population who are very active, which reduces their endeavor level and ultimately become an economic burden. So, early intervention and partial meniscectomy, which offers very accurate momentary result, is imperative to make them healthy and return to their normal activity.

Keywords: Childress test (Duck walk test); medial meniscal tears; Arthroscopic Partial Meniscectomy.

INTRODUCTION

Meniscal tears appear commonly, and but the specific clinical diagnosis of the tear is no longer constantly possible, even for the experienced orthopedic surgeon. A thorough patient records and physical examination are fundamental for the analysis of meniscal disease. The diagnosis can be made accurately 75% of the time on the foundation of records taking alone [1, 2]. In addition to a cautiously taken history, the physical examination stays the popular approach for affirmation of a meniscal tear.

Various physical diagnostic assessments are accessible to verify meniscal lesions, such as comparison of joint effusion and joint line tenderness, the McMurray test, the Apley compression test, the squat test and block to extension [3-5]. Fowler and Lubliner [6] informed that the McMurray test is particularly particular in detecting pathologic menisci when combined with a block to extension. However, different research exhibits the limitations of the McMurray test [7, 8]. The Apley compression and distraction tests correlate poorly with meniscal lesions [9, 10]. The squat test is the most beneficial provocative manoeuver to distinguish meniscal pain from patello-femoral pain. Joint line tenderness is the most correct medical signal of a meniscal tear and is current in 77% to 86% of the instances [11, 12].

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Fowler and Lubliner [9] referred to a specific correlation between joint line tenderness and meniscal pathology. In their study of 161 knees, 125 patients had joint line tenderness. The sensitivity used to be 85% and the specificity was once 29.4%. Patients with all derangements of the knee have been protected in their study. Anderson and Lipscomb [10] boasted an 87% correct analysis rate; however, they excluded patients with anterior cruciate ligament pathology.

The correlation of joint line tenderness and meniscal lesions in patients with acute anterior cruciate ligament (ACL) tears was once studied by Shelbourne *et al.,* [13]. They cited that medial joint line tenderness was once 44.9% sensitive and 34.5% particular in predicting medial meniscal injury. Lateral joint line tenderness was once 57.6% sensitive and 49.1% particular in predicting lateral meniscal injuries. They concluded that the presence or absence of joint line tenderness in patients with an acute ACL tear is no longer a dependable criterion to predict the probability of a related meniscal tear. However, the accuracy records for joint line tenderness are no longer reachable for prediction of meniscal lesions with chronic ACL injuries.

Although joint line tenderness is one of the best recognized and best assessments to perform, its accuracy has no longer been broadly suggested in the literature. In a meta-analysis, Scholten *et al.,* [14] reported that the accuracy of assessment of joint line tenderness in the diagnosis of meniscal tears was determined in only nine researches that met the determination criteria.

METHODS

This prospective interventional study was carried out in the admitted patient's Department of Orthopaedic, National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Sher-E-Bangla Nagar, Dhaka, Bangladesh for the duration of the period from January 2013 to December 2014. This study was carried out on 20 patients the find out about the population including male and female patients above 16 years of age in the Department of Orthopaedic, National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Sher-E-Bangla Nagar, Dhaka. The general surgeon, Orthopedics surgeon and Physiotherapist, were primarily involved in the decision-making process. The patient made the treatment decision following a thorough discussion with the multidisciplinary team, which included general surgeon, Orthopedics surgeon and Physiotherapist.

Data was collected from patients' medical records, radiographs and MRI reports. Statistical analysis of the results was previously obtained using a window-based computer software program created with Statistical Packages for Social Sciences (SPSS-24).

RESULTS

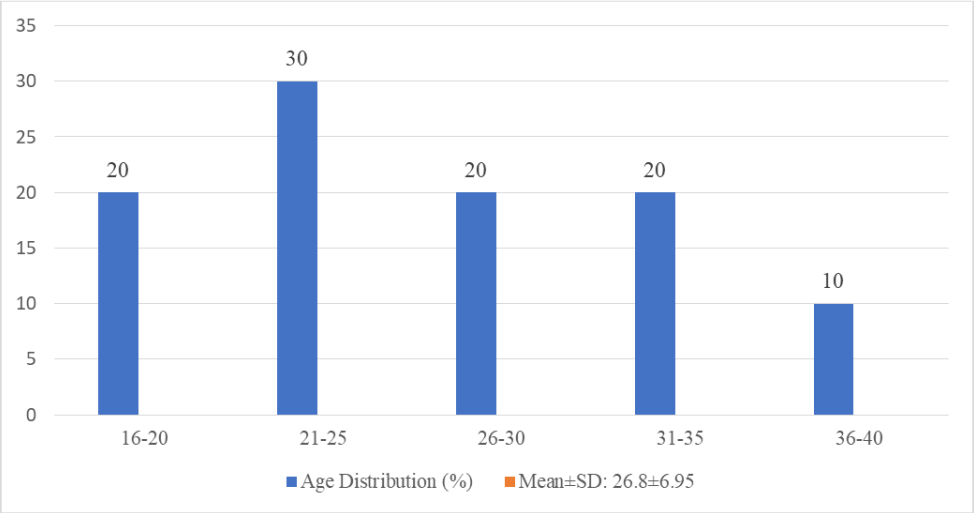

Figure I: Demonstrate and Distribution of patients by age (n=20)

Figure I demonstrated and distribution of 20 patients aged 16 to 40 years. Here according to Age distribution, 4(20%) were 16-20 years, 6(30%) were 21-25 years, 4(20%) were 26-30 years, 4(20%) were 31-35 years and 2(10%) were 36-40 years.

Table-1: Distribution of patients by cause of injury (n=20)

Cause of injury	No. of patients	Percentage
Sports	10	50
RTA	4	20
Jumping	4	20

Accidental fall	2	10
Total	**20**	**100**

Table 1 demonstrated the Distribution of patients by cause of injury. According to Cause of injury of Sports were 10(50%), RTA were 4(20%) and Jumping were 4(20%) and accidental fall 2(10%).

Table-2: Duration from injury to operation in months (n=20)

Duration of sufferings (months)	Number of patients	Percentage	Mean±SD
5 - 10	6	30	14±5.8
10 - 15	6	30	
15 - 20	4	20	
20 - 25	4	20	
Total	**20**	**100**	

Table 2 demonstrated the Duration from injury to operation in months (n=20). According to Duration of sufferings of 5 – 10, 10 – 15, 15 – 20 and 20 - 25 were 6(30%), 6(30%), 4(20%) and 4(20%) respectfully.

Table-3: Subjective functional outcome evaluation after at 6 months (n=20)

Subjective outcome		Number of patients		Percentage	
		Preoperative	Postoperative	Preoperative	Postoperative
Knee function	Normal	0	16	0	80
	Near normal	0	4	0	20
	Abnormal	20	0	100	0
Pain	Mild	6	7	30	70
	Moderate	7	6	70	30
	Severe	0	0	0	0
Giving way	No	0	20	0	100
	Occasional or more	20	0	100	0
Swelling	No swelling	0	18	0	90
	Mild swelling	20	2	100	10

Preoperative clinical evaluation showed that all patients had abnormal knee function, mild to moderate pain. All of them complained of swelling and giving way.

Postoperatively 90% patients regained normal to near normal knee function and knee stability. Significant improvement of pain and swelling also occurred.

Table-4: Objective functional outcome evaluation at six months (n=20)

Objective outcome		No. of patients		Percentage	
		Preoperative	Postoperative	Preoperative	Postoperative
knee flexion	<130°	14	2	70	10
	>130°	6	18	30	90
Childress test/ duck walk test	Positive	16	0	80	0
	Negative	4	20	20	100
Joint Line Tenderness	Positive	16	0	80	0
	Negative	4	20	20	100
McMurray test	Positive	14	2	70	10
	Negative	6	18	30	90

Childress test (duck walk test) and Joint Line Tenderness was positive in case of 80% patients. 80% patients had Joint Line Tenderness test positive. McMurray test was positive in 70 % cases. 70% patients had <130^{o} knee flexion and 30 % had more than 130^{o} flexion preoperatively.

Post operatively Childress test/duck walk test and Joint Line Tenderness test became negative in nearly all patients, 100% patients showed Joint Line Tenderness test negative, McMurray test was positive only in 10 % cases, 90% patients had more than 130^{o} knee flexion and only 10 % had less than 130^{o} flexion.

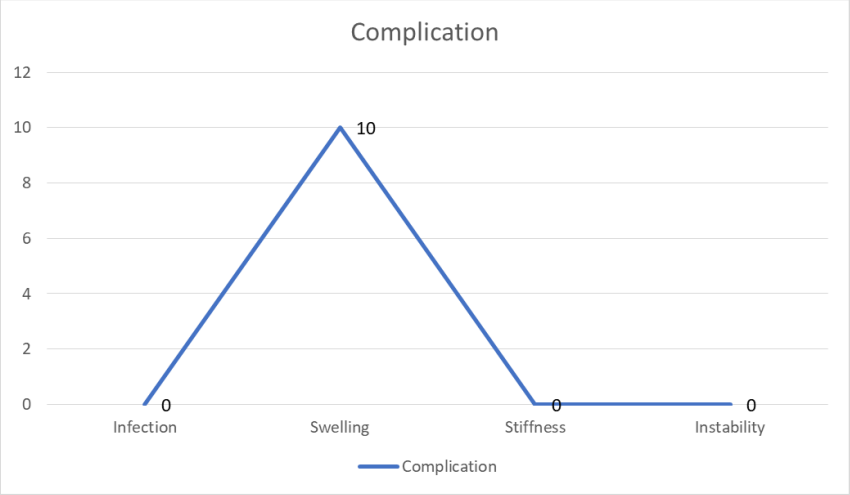

Figure II: Postoperative complications

Figure II demonstrated the Postoperative complications (n=20). According to Complications of Infection, Swelling, Stiffness and Instability were 0(0%), 2(10%), 0(0%) and 0(0%) respectfully.

DISCUSSION

Meniscal tears are a frequent reason of practical impairment of the knee. Because MRI is expensive, diagnostic physical tests can be beneficial screening tools in decision making related to MRI use. In practice, the duck walk test would be used as a screening test and consequently sensitivity is the most essential diagnostic value. Intrigued by using Childress' principle in the back of the duck walk test we ought to decide its diagnostic value. In addition, we examined whether or not the consequences had been influenced with the aid of place of the tear (medial or lateral), reason of the lesion (traumatic versus degenerative), and the presence or absence of ACL insufficiency. The subject was 20 patients aged 16 to 40 years. According to age distribution, 4(20%) were 16-20 years, 6(30%) were 21-25 years, 4(20%) were 26- 30 years, 4(20%) were 31-35 years and 2(10%) were 36-40 years. According to gender 80% were male, 20% were female.

DeHaven and Collins [2] informed four instances with a preoperative medical prognosis of meniscal tears in which ACL lesions had been referred to at arthroscopy. However, the test used for detecting ACL rupture and the motive because the tears had been no longer recognized with the aid of clinical examination had been now mentioned in the text. The author used a Lachman Test for diagnosing ACL rupture and neglected two ACL lesions that had been recognized beneath anaesthesia. Eren [15] recognized six ACL lesions at anaesthesia. Clinical examination of ACL damage with a displaced bucket-handle tear may reveal a stable knee [13]. This should be the essential purpose for lacking these ACL lesions. The different feasible aspect was once that, in the existing study, the two ACL lesions which have been neglected were in athletic men with muscular bodies.

Four patients with chondromalacia of the medial femoral condyle and one with chondromalacia of the lateral femoral condyle have been misdiagnosed as having medial meniscal tears. Three patients with chondromalacia of the lateral femoral condyle and one patient with chondromalacia of the medial femoral condyle had been misdiagnosed as having tears of the lateral meniscus. The absence of nerve fibers in articular cartilage is possibly the motive chondral lesions are most regularly unsuitable for meniscal tears. Chondromalacia patella correlates poorly with the presence of joint line tenderness. Eren [14] determined that in three patients with chondromalacia patellae, joint line tenderness used to be present. However, three meniscal tears had been misdiagnosed as chondromalacia patella. In this study, according to Distribution of Side involvement of the knee (n=20). According to Side involvement of Right knee were 8(40%) and Left knee were 12(60%). According to Meniscus involvement of Medial meniscus was 12(60%) and Lateral meniscus were 8(40%). According to Cause of injury of Sports were 10(50%), RTA were 4(20%) and Jumping were 4(20%) and accidental fall 2(10%).

We are conscious of the obstacles of this study; with a retrospective learn about design being possibly the main limitation. The important bias this added used to be verification bias. It is positive that in some—perhaps many—patients studied here; a tremendous duck walk test would have made it greater possibly that confirmatory MRI would be ordered. This would be anticipated to motive the calculated sensitivity we report right here to overestimate—perhaps through a full-size margin—the real sensitivity of the test in exercise [16-20]. While this bias additionally would possibly motive us to underestimate the specificity of the test, this matters little, for the reason that the duck walk test is a screening test, no longer a confirmatory

check (in practice, MRI is the desired confirmatory test). In 33 (24%) patients the orthopaedic doctor used to be already conscious of the MRI consequences when performing the duck stroll test. Interpretation of the duck stroll test consequently ought to be biased and additionally may want to have led to overestimation of the test's accuracy [21].

In this study, according to duration of sufferings of 5 – 10, 10 – 15, 15 – 20 and 20 - 25 were 6(30%), 6(30%), 4(20%) and 4(20%) respectfully and according to the Postoperative complications the complications of Infection, Swelling, Stiffness and Instability were 0(0%), 1(10%), 0(0%) and 0(0%) respectfully. Childress test (duck walk test) was positive in case of 80% patients. 80% patients had Thessaly test positive. Mc Murray test was positive in 70 % cases. 70% patients had $<130^{o}$ knee flexion and 30 % had more than 130^{o} flexion preoperatively. Post operatively Childress test/duck walk test became negative in all patients, 100% patients showed Thessaly test negative, McMurray test was positive only in 10 % cases, 90% patients had more than 130^{o} knee flexion and only 10 % had less than 130^{o} flexion.

All patients had abnormal knee function and mild to moderate pain, according to preoperative clinical evaluation. They all complained about swelling and giving way. This study found significant improvement of pain and swelling. 90% of patients regained normal to near-normal knee function and stability after surgery. Pain and swelling were also significantly reduced.

We did not locate that the duck walk test carried out higher in any specific subpopulation of patients. With the numbers available, it was once now not extra sensitive in detecting medial versus lateral tears (or anteromedial versus posteromedial tears), or tears in patients with differing diagnoses. Comparing our consequences with these of other studies is difficult due to the fact particular diagnostic research or accuracy values had been only mentioned in the study about by using Pookarnjanamorakot *et al.,* [22], a cross-sectional potential study of one hundred patients with an ACL damage and signs and symptoms of instability. They in contrast quite a few meniscal tests and even though it was once now not a diagnostic find out about on the duck walk test particularly and tests are entirely described for patients with ACL injury, it is the only study about appropriate for contrast with outcomes of our study. Because considerable variations have been located in the incidence (50% versus 75%) between the two studies, predictive values should no longer be compared.

Limitations of the Study

This was a prospective interventional study with a small sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION

Meniscus injury frequently takes place in young adult population who are very active, which reduces their endeavor level and ultimately become an economic burden. Because of the difficulty of verification bias, the genuine sensitivity of this test in practice is probably much decrease than the calculated sensitivity we observed. In addition, the test did no longer appear to operate higher in patients with trauma or ACL insufficiency, nor used to be effective in detecting medial than lateral tears, even though the numbers on some of those comparisons were rather small. The duck walks test/Childress' Test and Joint Line Tenderness showing significant clinical method and determining the clinical improvement after Arthroscopic Partial Meniscectomy performing early in adult patients.

RECOMMENDATION

This study can serve as a pilot to much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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DECLARATION

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