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KNEE PAIN PRESENTING AS LUMBAR RADICULOPATHY: A CASE REPORT

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ABSTRACT

Background: Knee pain in general and if to be specific pain located anteriorly and it is widespread among teenage, adults, and old age population. Among the anterior knee pain etiologies, patellofemoral pain is one of the most common cause of knee pain. One of the significant issue with the patellofemoral pain is that most of the time it is misdiagnosed or it is underrated for patients' problems, which in the long run lead to severe functional limitations and muscular atrophy. Right clinical diagnosis at an early phase in musculoskeletal conditions is vital.

Case summary: The patient presented with chief complaints of diffused pain over right leg tracking it over to the lower back. She presented with a painful limping gait. No tenderness was noted over the lower back; the neural tension test was nonsignificant. Patellar compression test, Clark's test, eccentric step was positive. Severe disuse quadriceps muscular atrophy was noted over-involved limb. Tenderness over the retropatellar surface was significant. The patient was managed with cryotherapy at home, therapeutic ultrasound over the tender area along with Kinesio taping, proprioception exercises, stretching, and strengthening exercises.

Outcome measure: Pain, ROM, girth measurement, gait pattern. Significant improvement was noted in pain on NPS, ROM, and gait pattern in two weeks management.

Conclusion: The Physiotherapy management in cases of anterior knee pain, specifically patellofemoral pain, mainly consisting of kinesiotaping, therapeutic ultrasound, cryotherapy, therapeutic exercises are very effective provided right clinical diagnosis, is made. The treatment outcome may be more fruitful if the correct clinical diagnosis is made at an early stage.

Keywords: anterior knee pain, lumbar radiculopathy, antalgic gait, quadriceps atrophy, Kinesio taping, eccentric step test.

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INTRODUCTION

Knee pain is widespread among teenage, adults, and old age population (active and sedentary lifestyle people as well). To be specific pain located over the anterior aspect of knee contributes major part accounting for 11-17% in overall knee pain pathologies [1,2]. The prevalence of anterior knee pain ranges as wide as 15-45% among the general population [3,4].

The diagnosis of anterior knee pain is mainly made on following findings presence of anterior or retropatellar knee pain which mostly aggravates on prolonged sitting and activities which put pressure and weight on patellofemoral joint, such as squatting, kneeling, running, and ascending and descending steps. As currently there is no standard protocol which may help us to diagnose anterior knee pain, the inclusion of the eccentric stepdown test may help to increase the likelihood of a diagnosis of PFPS from 40% to 65% [5]

The cause of anterior knee pain was found to be many, among the prominent reasons are abnormal tracking of the patella and decreased proprioception, [6]. The tightness of the lateral knee retinaculum, hamstrings, iliotibial band, and gastrocnemius; overpronation of the subtalar joint [7], depth of the trochlear groove [8]. A study [9], demonstrated the higher electrical activity of the vastuslateralis muscle in patients with PFPS.

The diagnosis of PFPS mainly took note of the assessment of morphology, stability, and tracking of the patella and overall general function of the PF joint [10]. When the diagnosis of PFPS is made choice of management options are many, condition to the most effective management option has to be found out [11]. Currently, evidence-based-management options are taping, strengthening of the hip musculature and quadriceps, manual therapy to the lower quarter, and fitting of foot orthoses [12,13].

This present case report was to see the effect of the Kinesio taping, therapeutic ultrasound, cryotherapy, and exercises. And simultaneously stressing the importance of physical assessment in the right clinical diagnosis.

Patient information:

A female aged 38 years old housewife from Jammu and Kashmir on 11th April 2018 came to physiotherapy OPD with chief complain of pain in the right lower limb. She was referred from Orthopaedic and Neurology OPD. She complained of severe pain in the right leg for the last one month, which was intermittent with relapses and remissions for two and a half long years.

She visited many private Orthopaedic hospitals and was managed with a diagnosis of mechanical low back pain with radiation of pain to the right leg and osteoarthritis right knee. But she did not get any significant relief. She underwent knee X-rays many times and even MRI two times for the right knee. One of the MRI reported lateral meniscus tear while the repeated MRI reported medial meniscus tear questioning their reporting reliability and thereby adversely affecting further management strategies.

She entered the physiotherapy OPD room with a limping gait, and her symptoms were mimicking as that of a typical lumbar radiculopathy pain. She was having severe pain in the right lower leg and less pain in the lower back. Pain history was insidious. She did not report any history of fall or any trauma.

Physical examination:

On physical examination, there was no local tenderness over the low back, and straight leg raising test was not significant, (neural tension test was negative) with mild muscular tightness in hamstrings.

Her educational qualification was graduation; her religious faith was Islamism; she was from a middle-income social family; her nature of work was relatively sedentary (according to the patient herself).

On general examination her built was normal, no obvious postural/joint deviations, normal bilateral foot arch. Her gait pattern was antalgic with little limping towards the involved (Rt) side.

Diagnostics and assessment:

Special physical test of patellar compression, vastusmedialis coordination test, the patellar apprehension test, eccentric step test, and Clarke's test were positive. On observation, there was no diffused joint swelling, and skin texture was normal. Mainly quadriceps muscle wasting was present.

GIRTH MEASUREMENT:

MEASURING POINT	RIGHT SIDE	LEFT SIDE
Tip of patella	34.5 cm	35.4 cm
5 cm above the tip of the patella	34.9 cm	37 cm
10 cm above the tip of the patella	36.7 cm	38.5 cm
15 cm above the tip of the patella	40.1 cm	40.9 cm

On palpation skin temperature was normal. Tenderness of grade 3 and four present over the medial, inferior border, and the posteromedial surface of the right patella. The pain scale was 9 out of 10 on (numeric pain scale) NPS. Sensory examination was normal. Active range of motion was not complete due to pain; passive ROM was within normal limit.

ROM	ACTIVE	PASSIVE
RIGHT SIDE	0-115	0-130
LEFT SIDE	0-131	0-132



Figure 1a: Local observation



Figure 1b: Girth measurement



Figure 1c: ROM measurement

MANAGEMENT:

Interventions:

The patient was managed with kinesiotaping, therapeutic ultrasound, cryotherapy, exercises, postural, and ergonomic care.

Kinesio-tapping: Kinesiotape was applied daily after application of therapeutic ultrasound, maintaining the position of patella in the neutral, or slightly in the superomedial position. The pain relief was instant in both maintained position of the patella.



Figure 2a: Kinesiotape application



Figure 2b: Complete knee extension



Figure 2c: Tapped patella in a neutral position

Therapeutic ultrasound: Patient underwent ultrasound therapy for 12 sessions with a multitherapy unit of Nonius-Ultrasound machine

SESSIONS	DOSE
1 st 4 SESSIONS	3 MHZ, .8 WATT/CM2, 4 minutes
NEXT 4 SESSIONS	1 MHZ, .8 WATT/CM2, 5 minutes
FINAL 4 SESSIONS	1 MHZ, 1 WATT/CM2, 6 minutes

Figure 3: Therapeutic Ultrasound application



Cryotherapy: Patient was advised to apply ice pack 2 to 3 times a day after an exercise session.

Therapeutic exercises: All exercise protocol were tailored according to the patient's tolerance and progressed gradually.

ROM exercises: Active ROM exercises in pain-free range without tape started on day one itself.

After kinesiotape application:

	INVOLVED SIDE	UNINVOLVED SIDE
1 ST 2 DAYS	Complete active ROM exercises, 5 repetitions, 2 sets	Complete AROM, 2 sets, 10 repetitions
NEXT 4 DAYS	AROM of 8 repetitions, 2 sets	AROM of 12 repetitions, 2 sets
NEXT 4 DAYS	AROM of 10 repetitions, 2 sets	AROM of 15 repetitions, 2 sets
FINAL 2 DAYS	AROM of 12 repetitions, 2 sets	AROM of 15 repetitions, 2 sets

Squats and lunges to approximately one-third of total knee ROM (pain-free range) started from day one itself.

SQUATS	LUNGES	STATIONERY CYCLING
5 squats for 2 sessions, then 8 squats for next 4 sessions, 10 squats for next 4 sessions, and 12 squats for next 2 sessions (all in pain free range)	5 lunges for 2 sessions, then 8 lunges for next 4 sessions, 10 lunges for next 4 sessions, and 12 lunges for next 2 sessions (all in pain-free range)	Stationery cycling (2 sessions) with seat adjusted a little high started for 3 minutes for initial 2 days, then 5 minutes for next 2 days, 8 minutes for next 2 days, 12 minutes for next 2 days, and 15 minutes for last 4 days



Figure 4a: Stationary cycling



4b: Squats

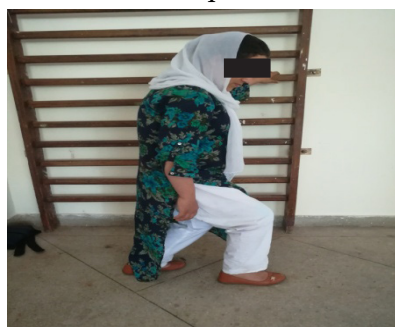


Figure 4c: Lunges

Strengthening exercises:

Muscles	Isometric strengthening	Dynamic strengthening
Quadriceps	10 repetitions withhold of 5 seconds gradually increased to 15 repetitions of 2 sessions per day	5 repetitions initially without any added resistance for 2 sessions (days), gradually increased to 8 repetitions for the next 4 sessions, then to 10 repetitions for last 5 sessions.
Hamstrings	10 repetitions withhold of 5 seconds gradually increased to 15 repetitions	5 repetitions without any resistance for 2 sessions, increased to 8 repetitions for the next 4 sessions, increased to 12 repetitions for next 4 sessions, increased to 15 repetitions for the next 2 sessions.
Hip extensors		8 repetitions for 4 sessions, 10 repetitions for next 4 sessions, 15 repetitions for next 4 sessions
Hip abductors		8 repetitions for 4 sessions, 10 repetitions for next 4 sessions, 15 repetitions for next 4 sessions
Hip flexors		8 repetitions for 4 sessions, 10 repetitions for next 4 sessions, 15 repetitions for next 4 sessions
Dorsiflexors		8 repetitions for 4 sessions, 10 repetitions for next 4 sessions, 15 repetitions for next 4 sessions
Planterflexors		8 repetitions for 4 sessions, 10 repetitions for next 4 sessions, 15 repetitions for next 4 sessions

Stretching exercises:

Gentle active stretching of the following musculature was performed:

Illiotalband/tensor fascia lata, tendo-Achilles/ gastro-soleus, quadriceps, hamstrings 2-3 repetitions of stretching with 30 seconds of hold period were performed.

Follow up, and outcome: All treatment approaches helped manage the patient's symptoms. Kinesiotape application had immediate pain relief.

The patient did not turn up personally for subsequent follow-ups but was inquired about the symptoms on the phone twice, 1st at July and secondly in October. She insisted that she was much better than before. She reported pain of 2 on the numeric pain scale in July and 3 in October.

DISCUSSION

The presentation of this case was very unusual. The patient presented with the chief complaint of right leg pain associated with low back pain mimicking the case to lumbar radiculopathy. On examining the patient and relating the history to present presentation, clinically, the condition closely resembled chronic patellofemoral pain syndrome. The vastusmedialis coordination test, the patellar apprehension test, or the eccentric step test increases the chances of diagnostic outcome of PFPS to a significant extent [5].

Etiology of the patellofemoral pain is multifactorial and is ill-understood. Trauma may be one of the cause. Here

faulty ergonomic approach may be a predisposing factor. Besides the patient has to very often kneel for her routine prayers. One of the mechanism that is the friction of medial patellar facet on the upper border of the femoral condyle may be the cause of chondromalacia [14]. Presence of surface degeneration cannot be held responsible for the symptom of patellofemoral pain in young people, a basal disorder of cartilage, called fasciculation, has been detected upon a specific part of the patella of young patients suffering from intractable patellofemoral pain, and arguments are adduced to suggest that it is a cause of that pain [15]. She was suffering from the same problem for the last 2 to 3 years. She attended many Orthopedic OPD and underwent repeated knee X-rays and MRI scans. Knee radiography revealed bilateral laterally tilted patella, Right side more than left. She underwent MRI scans twice. One of the scans reported small tear in the anterior horn of lateral meniscus, while the other scan which was repeated after a few months reported tear in posterior horn of the medial meniscus. This questions the reliability of both the scans. The diagnosis of PFPS mainly took note of the assessment of morphology, stability, and tracking of the patella and overall general function of the PF joint. The main diagnostic criteria in PFPS consisted of anterior or posterior patellar surface pain, which usually increases on weight-bearing activities on the patellofemoral joint such as stair climbing activities, kneeling, squatting, etc. [16]. Imaging modality has a functional role in the diagnosis of PFPS. Most patients with chondromalacia patella have focal increased signal in the cartilage or focal contour defects in the cartilage surface on T-2 weighted MR images. These MR findings are not seen in most patients with healthy cartilage [17]. All imaging techniques studied had high specificity and accuracy in the detection and grading of chondromalacia patella; however both MR arthrography and CT arthrography were more sensitive than T-1 weighted, proton density-weighted, and SPGR with fat saturation MRI imaging for showing an intermediate grade of chondromalacia patella [18].

As far as management of any case is concerned, it directly relies on the accurate diagnosis. Here the diagnosis of patellofemoral pain is delayed leading to severe disability and quadriceps muscle wasting. One study stressed that most of the PFPS cases could be managed conservatively, the only a small selected group need arthroscopic surgical intervention having severe and persistent symptoms, thereby getting substantial benefits with minimum side effects [19]. Due to lack of standard management approaches in cases of PFPS, variety of exercise prescription, and advice regarding sporting and leisure activities were adopted [20]. This case is managed with kinesiotape application, therapeutic ultrasound, ergonomic care, cryotherapy, and therapeutic exercises. Many studies have concluded that patellar taping helps to decrease pain [21,22]. A study by Tony Wilson et al. [23] concluded that taping the patella using glide techniques in different planes resulted in significant pain reduction in PFPS patients. Neutral and lateral glide techniques were more effective in pain reduction than me-

dial glide technique. In this case, the Kinesiotape was applied to maintain the position of patella in superomedial position and to compress the slightly elevated medial border of the patella, i.e., medial glide, as well as maintaining the patella in neutral glide. The pain relief was instant in both methods; the patient was able to do a complete knee extension without any pain.

Therapeutic ultrasound was applied over tender areas from day one for regular 12 sessions (days). Therapeutic ultrasound, in combination with exercises, resulted in significant pain relief along with functional improvement in amateur squash players [24].

Cryotherapy was performed by the patient herself twice a day after exercise session for 12 to 15 minutes. Therapeutic exercises involving stretching, strengthening, endurance, and proprioceptive training were undertaken. All treatment approaches helped manage the patient's symptoms. Kinesiotape application had immediate pain relief. It may be due to alteration of the position and mechanics of patella, which reduces the stressful forces on pressure points on the patella. The patient did not turn up personally for subsequent follow-ups but was inquired about the symptoms on the phone twice, 1st at July and secondly in October. She insisted that she was much better than before. She reported pain of 2 on the numeric pain scale in July and 3 in October.

CONCLUSION

Properly designed studies have to be undertaken to strengthen the treatment aspect so that standard treatment protocol can be developed to address the problem. Proper assessment concerning accurate diagnosis (as near as possible) should be the topmost priority in clinical practice. Along with other diagnostic modalities, physical assessment based, clinical diagnosis should also get equal importance.

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