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Case Report

Physiotherapy Section

Physiotherapy Management of Kager's Fat Pad Irritation Associated with a Multi-ligament Ankle Sprain and Tendinopathy in a 35-Year-Old Male Patient: A Case Report

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ABSTRACT

Kager's fat pad irritation is an under-recognised source of posterior ankle pain, especially when occurring alongside multiligament ankle sprains and tendinopathy. This case report describes the rehabilitation of a 35-year-old male who presented with chronic right ankle pain and instability, attributed to long-term barefoot walking for religious purposes and repeated, untreated ankle sprains. Magnetic Resonance Imaging (MRI) revealed irritation of the Kager's fat pad, sprains of the Anterior Talofibular Ligament (ATFL), Calcaneofibular Ligament (CFL), Posterior Talofibular Ligament (PTFL), and tenosynovitis of the posterior tibialis and flexor digitorum longus tendons. The patient underwent a physiotherapy programme focused on pain relief, proprioceptive retraining, strengthening, and functional restoration. Over the course of rehabilitation, the patient demonstrated marked improvements in pain, stability, and balance, with the Numeric Pain Rating Scale (NPRS) decreasing from 6 to 0, Balance Error Scoring System (BESS) errors reducing from 21 to 8, and the Foot and Ankle Ability Measure – Activities of Daily Living (FAAM-ADL) score improving from 61% to 92%. This case emphasises the effectiveness of conservative physiotherapy in complex ankle pathologies and the need to consider cultural factors like habitual barefoot walking in clinical decision-making.

Keywords: Ankle injuries, Fat pad inflammation, Physical therapy modalities, Postural balance, Proprioception, Tendinopathy

CASE REPORT

A 35-year-old male presented to the physiotherapy Outpatient Department (OPD) with right foot pain worsened by walking, squatting, and terminal plantarflexion for three weeks. The patient reported a long-standing history of walking barefoot as a part of his religious practice ("bhakti") and spiritual lifestyle. Over several years, he had experienced multiple episodes of right ankle sprain, which he neglected due to the transient nature of the pain and his high pain tolerance. Approximately one month prior to his visit, the patient experienced a significant increase in right ankle pain following an episode of forceful plantarflexion while walking on uneven terrain. The pain was described as deep, dull, aching pain located in the posterior ankle with episodes of sharp pain during active movement and weight-bearing activities. There was associated swelling and difficulty in prolonged standing or walking barefoot. Despite using home remedies, there was no relief, prompting him to seek medical attention. MRI of the right ankle revealed signs of Kager's fat pad irritation, along with sprains of the Anterior Talofibular Ligament (ATFL), Calcaneofibular Ligament (CFL), and Posterior Talofibular Ligament (PTFL). Additionally, there was tenosynovitis of the posterior tibialis tendon and the Flexor Digitorum Longus Tendon (FDLT) [Table/Fig-1]. The diagnosis of a multi-ligamentous ankle sprain with tendinopathy and fat pad irritation was established. The patient was referred to the Department of Sports Physiotherapy for conservative management.

The clinical findings at initial evaluation are summarised in [Table/Fig-2]. The patient's primary complaints included right posterior ankle pain, aggravated by barefoot walking, squatting, and plantarflexion. Pain was dull and aching, with intermittent sharp episodes rated 6/10 on the Numeric Pain Rating Scale (NPRS) during activity. He had a long-standing history of barefoot ambulation and recurrent ankle sprains. Gait analysis revealed reduced push-off, antalgic gait, and impaired weight-bearing. Manual muscle testing revealed weakness in the tibialis posterior and toe flexor muscles. Ligamentous integrity tests, such as the Anterior Drawer and Talar Tilt, were positive.

[Table/Fig-1]: MRI images, sagittal view of the ankle showing Kager's fat pad oedema (hyperintensity), and tenosynovitis of the posterior tibialis in the right ankle.

Parameter	Pre-Treatment Findings	Post-Treatment Findings
Palpation	Tenderness at the Achilles insertion, Kager's fat pad area, and lateral ligaments. Crepitus over the posterior tibialis tendon.	Tenderness absent
Range of Motion (ROM)	Dorsiflexion: 0-10° (pain at end-range)- Plantarflexion: 0-30° (pain beyond 20°)- Inversion: Limited, painful- Eversion: Mild pain	Dorsiflexion: 0-15° (painless) Plantarflexion: 0-40° (painless) Inversion: Full, mild discomfort Eversion: Full, pain-free
Manual Muscle Testing	Tibialis Posterior: 3/5 (painful)- Peroneals: 4/5- Calf Muscles: 4/5- Toe Flexors (FDLT): 3+/5 (painful)	Tibialis Posterior: 4+/5 (painless) Peroneals: 5/5 Calf Muscles: 5/5 Toe Flexors (FDLT): 4+/5 (painless)

Special Tests	- Anterior Drawer Test: Positive (ATFL sprain)- Talar Tilt Test: Positive (CFL sprain)- Posterior Drawer: Mildly positive- Thompson Test: Negative	Anterior Drawer Test: Negative, Talar Tilt Test: Negative, Posterior Drawer: Negative Thompson Test: Negative
Gait Assessment	Antalgic gait with reduced push-off, decreased right-side weight-bearing, and avoidance of heel rise.	Symmetrical gait with normal push-off and restored heel-toe pattern
Functional Scales	FAAM (ADL): 61%- FAAM (Sports): 42%- NPRS: 6/10 during walking	FAAM (ADL): 92% FAAM (Sports): 88 % NPRS: 0/10 (during walking)

[Table/Fig-2]: Clinical presentation and assessment findings.

Physiotherapy Intervention

The patient underwent a structured, goal-oriented rehabilitation protocol over 10+ weeks. Each phase of the programme was tailored to clinical findings and functional progression, as shown in [Table/Fig-3]. Initial management focused on pain and inflammation reduction using cryotherapy, taping, and Transcutaneous Electrical Nerve Stimulation (TENS). This was followed by progressive strength training, proprioceptive re-education, eccentric loading for tendinopathy, and eventual sport-specific and barefoot reconditioning.

Outcome Measures

Substantial improvement was observed in pain, balance, and function following the intervention. The patient's FAAM-ADL and Sports subscale scores improved significantly [Table/Fig-4].

At a follow-up conducted three months after completion of the 10-week rehabilitation programme, the patient continued to demonstrate excellent functional outcomes and maintained pain-free mobility. He was able to walk barefoot comfortably on both indoor and outdoor surfaces without recurrence of pain or swelling. The FAAM-ADL and FAAM-Sports scores remained stable, indicating sustained functional recovery. No further episodes of ankle instability or fatigue were reported. These findings suggest that the therapeutic benefits of the structured physiotherapy programme were retained beyond the formal intervention period, emphasising the importance of proprioceptive maintenance exercises and patient adherence to home-based barefoot gait training.

Phase	Goals	Interventions	Dosage	Duration
Acute Phase (Week 1-2)	Reduce pain & inflammation- Protect soft tissues- Minimise swelling	- RICE protocol (Rest, Ice, Compression, Elevation- TENS for pain relief- Rigid taping- Pain-free AROM (ankle DF/PF)	- Ice: 15 min, 3-4×/day- TENS: 20 min/session, 1-2×/day- AROM: 10 reps × 3 sets, 2×/day	7-10 days
Sub-Acute Phase (Week 2-4)	Improve ROM- Activate key muscles- Enhance proprioception	- Isometric contractions (tibialis posterior, peroneals)- Theraband exercises (inversion/ eversion)- Wobble board seated proprioception- Toe curls & towel scrunch	- Isometrics: Hold 5 sec × 10 reps × 3 sets- Theraband: 10-15 reps × 3 sets/day- Proprioception: 2-3 min × 2 sets/ day- Intrinsics: 10 reps × 2-3 sets/day	2-3 weeks
Recovery Phase (Week 4-6)	Strengthen dynamic stabilisers- Normalise gait- Improve tendon function	- Heel raises (bilateral to unilateral)- Step-ups/downs- Balance on foam pad- Resisted ROM with band- Eccentric tibialis posterior loading	- Heel raises: 15 reps × 3 sets/day- Balance: 30 sec × 3 sets- Theraband: 3 sets of 15 reps- Step-ups: 10 reps × 2 sets	2 weeks
Strengthening Phase (Week 6-8)	Dynamic strength- Agility and balance- Tendon resilience	- BOSU ball balance- Single-leg stance on uneven surface- Agility ladder- Eccentric heel drops- Plyometric hopping drills	- Plyometric exercises: 20–30 second bouts, 3–4 rounds Balance: 1-2 min hold × 3- Ladder: 3-4 passes/ session- Eccentric drops: 3 sets of 15 reps	2 weeks
Return to Activity Phase (Week 8-10+)	Sport-specific tasks- Barefoot readiness- Prevent recurrence	- Gradual barefoot walking on grass- Sport-specific drills- Home programme continuation- Education on terrain/surface	- Barefoot walking: start 5-10 min/ day → 30 min- Drills: 20 min sessions- HEP: 30 min/day	Ongoing

[Table/Fig-3]: Goal-oriented physiotherapy intervention plan for Kager's fat pad irritation with multiligament ankle sprain and tendinopathy.

Outcome Measure	Pre-Treatment Score	Post-Treatment Score
FAAM (ADL)	61%	92%
FAAM (Sports)	42%	88%
NPRS (During walking)	6/10	0/10
BESS (Total errors)	21 errors	8 errors

[Table/Fig-4]: Comparison of pre- and post-treatment outcome measures following physiotherapy intervention.

DISCUSSION

The present case report describes a 35-year-old male presenting with Kager's Fat Pad (KFP) irritation associated with multi-ligamentous ankle sprain and posterior tibialis and flexor digitorum longus tendinopathy. Substantial improvement was achieved following a structured, goal-oriented physiotherapy programme emphasising inflammation control, tendon protection, proprioceptive retraining, and barefoot gait adaptation. The patient's FAAM-ADL improved from 61% to 92%, FAAM-Sports from 42% to 88%, NPRS reduced from 6/10 to 0/10, and BESS errors decreased from 21 to 8, reflecting marked gains in function, balance, and pain reduction.

This case is distinctive when compared to existing literature, as most documented instances of Kager's fat pad pathology describe involvement in posterior ankle impingement syndrome or Achilles tendon disorders rather than in conjunction with multi-ligament sprains and tendinopathy [1-5]. In contrast to these reports, our case demonstrates that chronic mechanical loading due to habitual barefoot walking and repeated lateral ankle sprains can lead to cumulative irritation and inflammatory changes within the KFP [5,6].

MRI findings confirmed not only KFP irritation but also sprains of the Anterior Talofibular Ligament (ATFL), Calcaneofibular Ligament (CFL), and Posterior Talofibular Ligament (PTFL)—structures frequently implicated in Chronic Ankle Instability (CAI) when recurrent injury occurs. These findings align with existing evidence describing CAI as a condition characterised by reduced neuromuscular control and mechanical laxity, which were evident in the current case [7-9]. Additionally, the presence of tenosynovitis in the posterior tibialis and flexor digitorum longus tendons further complexity to the clinical presentation, consistent with previous findings linking overuse and compensatory gait mechanics with medial ankle tendinopathy [10,11].

Differential diagnoses for posterior ankle pain were carefully considered in this case. Retrocalcaneal bursitis was excluded due to the absence of localised swelling or tenderness superior to the calcaneal insertion of the Achilles tendon. Achilles tendinopathy was ruled out based on normal tendon contour and signal intensity on MRI, as well as the absence of pain during resisted plantarflexion. Posterior ankle impingement syndrome was also excluded, as the patient did not report pain during forced plantarflexion and imaging did not reveal os trigonum or bony impingement signs. Collectively, the clinical and radiological findings supported the diagnosis of Kager's fat pad irritation as the primary source of posterior ankle pain.

The physiotherapy intervention was designed in accordance with the multi-tissue involvement and chronicity of symptoms. The acute phase (weeks 1–2) emphasised pain relief, inflammation control, and tissue protection using cryotherapy, rigid taping, and gentle active ROM within a pain-free range. The subacute phase (weeks 2–4) incorporated isometric activation of key stabilisers (tibialis posterior, peroneals) and gradual progression to theraband resistance and proprioceptive retraining using wobble boards and seated balance drills. During the recovery phase (weeks 4–6), eccentric tendon loading, step training, and dynamic balance tasks were introduced to promote controlled strengthening. The strengthening phase (weeks 6–8) involved plyometric and agility ladder drills, BOSU-based balance training, and eccentric heel drops to enhance dynamic stability and tendon resilience. Finally, the return-to-activity phase (weeks 8–10) incorporated barefoot walking on grass, sport-specific retraining, and a home exercise programme to maintain function and prevent recurrence. This structured progression reflects the authors' clinical reasoning and aligns with contemporary rehabilitation models for chronic ankle instability and tendinopathy, emphasising sensorimotor control, neuromuscular re-education, and graded loading.

The tissue adaptability and regenerative capacity decline with age due to reduced collagen turnover and slower neuromuscular response times, as seen in the present case. Accordingly, rehabilitation progression was deliberately slower, emphasising proprioceptive retraining and gradual load tolerance.

This case adds to the limited evidence supporting conservative physiotherapy management of Kager's fat pad irritation when coexisting with ligamentous and tendinous pathology. Unlike prior reports describing fat pad irritation as a secondary phenomenon in impingement or post-surgical contexts, this case highlights it as a primary driver of posterior ankle pain and dysfunction. Moreover, habitual barefoot walking is identified as a culturally influenced biomechanical factor contributing to overuse injuries.

Although findings are limited to a single case, the authors suggest that early physiotherapy referral, comprehensive neuromuscular assessment, and individualised progression are critical in addressing complex multi-structure ankle pathologies. Future studies should explore long-term imaging follow-up and Kager's fat pad in chronic posterior ankle syndromes.

CONCLUSION

This case demonstrates that targeted physiotherapy can effectively treat Kager's fat pad irritation with associated ligament sprains and tendinopathy. A structured, goal-based rehabilitation programme led to significant improvements in pain, balance, and function. Early diagnosis and individualised intervention are essential for optimal recovery in complex ankle pathologies.

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