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Optimal stress reduces the patellofemoral pain: a case study

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Abstract

Background - Cartilage degeneration is associated with age related changes. Damage to patellofemoral joint cartilage causes misalignment and istability of lower limb, pelvis, and knee joint. Thus patellmaltracking and muscular imbalances are the results following PEPS. This study aimed to know about optimal stress causing management of patellofemoral pain syndrome.Method – single case was included in this study. She was treated with optimal stress technique. This created a lots of relief to the patient.Results – female patient got tremendous improvement in her condition following treatment. Pian score on VAS was reduced to zero. So patient could perform ADLs without pain easily.Conclusion – this method proved heavier efficacy to treat patients with PEPS. Therefore could be analyzed over large population in future

Introduction- patellofemoral arthritis is relatively common disorder which occurs owing to destruction of patellar and trochlear groove cartilage. Treatment for this condition is very difficult due to fact that lack of knowledge on articular degeneration and biomechanics as well as complexity of patellfemoral joint structure. [1] patellofemoral joint abnormality is due to soft tissue instability and lower limb mal alignment. This is also depend upon relation of knee with pelvis. [1] patellofemoral pain is concerned with excessive compressive forces over the joint. Thus comprehensive treatment plan will have soft tissue flexibility and biomechanical impairment.[2] knee pain is the consequences of PFPS mostly found in younger females without any structural changes. PFPS may include patellar maltracking, quadriceps,hams and iliotibial tightness.[3]thus muscular imbalance is the primary cause to develop PFPS. Clinical features may have pain behind and around the patella which gets worsen with sqatting, walking and stair climbing.[4] PFPS is also referred to as anterior knee pain or retropatellar pain syndromes. It include deviation in patellar mobility, tilting and decrease flexibility of Myofascial structures.[5] psychological factors cannot be ignored while considering about persistency of PFPS.[5]external risk factors for PFPS may have sports activity, environmental conditions and surface. On the other hand internal risk factors

may be like quadriceps and hams tightness, joint laxity, patellar mal alignment and hypomobility. These can be tested clinically by some tests like patellar apprehension test, patellofemoral grinding test and waldrone's test. Positivity of these clinical testing increases the chances of PFPS to a greater extent.[6]

Therefore PFPS affects both functional performance as well as financial status associated with overloading. So if proper management of PFPS is not carried out, excessive burden over society and health care system cannot be reduced efficiently. So this study aimed to determine influence of the optimal stress overcoming patellofemoral pain.

Methodlogy-

Case report –

In this experimental study, single case was taken as sample size. She was a female patient of 38 years of her age. She visits the department to get relief from painful condition as early as possible. Female patient was not able to walk up to 10 steps without help. Client was facing trouble a lot while walking. She complained against me for her worsen condition of both the knee joints. Patient was on medicine and attended physiotherapy continuously yet, she got no relief from severe pain. Client was so depressed and anxious that she left everything upon mercy of god. Now she was trying to search some kind of miraculous treatment for her problem which may be of great help for him.

Clinical tests –

1. **Moving patellar apprehension test**- it had been performed in two phases
   1st phase- (provocation oriented test) - patient was in supine position with tested knee in full extension. A lateral force was applied to the patella by the examiner's thumb. Followed by testing knee was moved by examiner from full extension to 90 degree of flexion and then returning to full extension while maintaining laterally applied force to the patella.
   2nd phase- (symptoms alleviation)- phase 1st was repeated with medially applied force to the patella by examiner's index finger and testing knee was in full extension. Again knee was moved from full extension to 90 degree of flexion and then returning to full extension.
   In the first phase, patient orally expressed apprehension and in second phase, patient showed comfort with normal range of motion. Thus test was found positive.

2. **Patellar grind test**- or (Clarke's test) patient was in supine position with testing knee in extension and then examiner placed his web space just superior to patella while applying pressure. Patient is asked to gently contract the quadriceps muscle. Patient felt the pain during procedure thus test was positive.
3. **Waldron's test**- patient was made to standing with examiner in front. Patient then did a few slow deep knee bends while examiner palpated the patella. In the course of procedure patient expressed the pain thus test was found positive.

Clinical findings-

s.n.	Test performed	outcome
1	Moving patellar apprehension test	Positive
2	Patellar grind test	Positive
3	Waldron's test	Positive

Positive findings of clinical tests showed that most probably patient was suffering from patellofemoral pain syndrome.

Patient had a score of 8 out of 10 on pain assessment scale (Visual analogue scale) while she was made to walk. And she had a score of 20% out of 100% on lower extremity functional scale. Client was also unable to perform her daily activities of life.

Physical interventions- during the procedure, medial, lateral and inferior patellar glides were carried out. Passive stretch with optimum force with 4 minute hold in each and every glide had determined. This passive stretch was maintained at the end of glide. In the course of treatment, an interval of 1 minute had fixed between each and every glide. Thus 3 successive attempts were carried out for each glide. In a way a total of 9 repetitions were performed in a single session of treatment. This method of treatment had followed up to 5 times in a week. And this was continued for a period of consecutive 6 weeks.

OUTCOMES- after completion of treatment, results were like that

- Patient was having a score of zero out of 10 on visual analogue scale
- A score of 90% out of 100% was made on lower extremity functional scale
- That time patient was able to do her daily activities of life along with that she can use stairs even without pain.

Discussion-

The findings from this study suggest that patients with patellofemoral pain in both the knees may be influenced by optimal stress which was applied over the tissue surrounding the patella on both sides of knee joints. This could be of great help to stretch the Myofascial structures passively while this is on hold for 4 minutes during the treatment session. Due to the fact that Myofascial release there will be reduction in pain and compression forces on the patellofemoral joint. As was according to a study done by Michel j. Mullaney et al.,(2016)[7]. They concluded that Myofascial restrictions may contribute to patellofemoral compression and pain due to some trigger points. And they could be benefited by passive stretch of involved muscles. This was consistent with current study.

Previous studies given in the literature had not used this kind of prolonged passive stretch to my best knowledge in this manner. But this current study had utilized prolonged passive stretch which is why it provided efficient and faster results in reducing patellofemoral pain. This could be due to normalized length of soft tissues included with myofascia, patellar retinaculum around the patellofemoral joint. Others literature also reported that most commonly patients with patellofemoral pain syndrome have stiff and tight quadriceps muscles. This causes restricted knee range of motion along with altered patellar position. Therefore patients feel pain during strenuous activities.

A study by Michel j. Mulleney et al (2016)[7] also investigated that tight patellar retinaculum and iliotibial band may be the result of lateral patellar displacement. This is also consistent with present study. In this study application of medial and lateral patellar glides during the treatment session were the cause of increased flexibility of iliotibial band and patellar retineculi. This was followed by reduced pain in both the knees. They also suggested that hypoflexed quadriceps muscles cannot be ignored in association with patellofemoral pain syndrome. Thus quadriceps flexibility was also achieved by the help of prolonged passive stretch. Furthermore another study by Si Mom Lack PhD et al (2018)[8] reported that increased medial and lateral retinecular thickness in patients with patellofemoral pain is strongly related to PFPS.

Other study by Regined Wing Shan Sit et al(2018)[9] favoured the present study. They considered that simple clinic based patellar mobilization have the ability to significantly reduce the patellofemoral pain and thus can improve the function. Another study by Hani A. Alkhwajah et al(2019)[10] reported that MWM was effective in treating patellofemoral pain. They also included that MWM not only initiate local physiological mechanisms but also

have ability to control central mechanisms. That can facilitate inhibitory pathways by which further pain could be reduced. As accordance with Carol A Coutney PT PhD et al(2018)[8].

According to Arun B et al(2018)[11] also stated that soft tissue mobilization have strong ability to decrease patellofemoral pain. They emphasized that specific and progressive forces can cause increased lengths of shorten structure like fascia. Other potential factors to initiate the PFPS like overloading the joint could not be ignored. As stated by Dyan V flores et al (20180[12] PFPS can involved with stair climbing, squatting and running due to the fact that compressive forces during these activities. In this experimental study passive repetitive glides may be result of reduced patellofemoral pain and improved function by being added mobility. This is consistent with study carried out by Barre Hunien Alsulaimani et al(2019)[13]they also reported that PFPS is the result of mal alignment of patella and muscular imbalance. Another study done by Marikaine Van Middel Koop PhD et al (2018)[14] summarized that lateral patellar tilt angle and larger lateral patellar displacement were the cause for PFPS. And according to Jainee Loudon et al(2016)[15] excessive patellofemoral joint stress could be due to mal tracking and mal alignment of patella. In current study longer passive stretch may cause to improve these abnormal factors. And this can be explained by decreased pain after treatment. This may be the result of increased flexibility of tissue around the patellofemoral joint.

In this study clinical application of repeated glides with passive stretch may be the cause of reduced patellofemoral pain and improved associated function as supported by study results. Pain score on visual analogue scale was reduced to zero and lower extremity functional score was improved up to 90% from 20%. Client was also able to perform strenuous activity without pain. Although other potential factors cannot be neglected but no doubt present study results have showed that this way of treatment is very effective to manage the patient's condition.

CONCLUSION- the current study suggest that repetitive glides with longer passive stretched maneuver for patient with patellofemoral pain syndrome laid out a comprehensive pain care upshot. This increases muscular flexibility, knee ROM and function. This method showed stronger efficacy to resolve painful conditions of PFPS. This approach could be further analyzed to determine its long term efficacy.

LIMITATIONS- the study lacked the greater sample size. And this concept can also be analyzed conditions. Measurement process may be changed to gain better efficacy of results.

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