

Peroneal Nerve Palsy due to Synovial Cyst of Proximal Tibiofibular Joint

Proksimal Tibiofibular Eklem Sinovyal Kistine Bağlı Gelişen Peroneal Sinir Felci

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Abstract

Synovial cysts are benign soft-tissue tumors that arise from synovial joints or tendon sheaths. Synovial cyst of proximal tibiofibular joint is a very rare condition, which is included in non-traumatic causes of peroneal nerve palsy. This article presents clinical, and radiological findings of peroneal nerve palsy in a 50-year-old male patient admitted with sudden drop foot. Based on the clinical examination, electroneuromyography data, magnetic rezonans image the compression of nerve by synovial cyst was confirmed. Peroneal nerve palsy was completely improved after surgical resection of synovial cyst and physical therapy and rehabilitation. In conclusion, synovial cysts of proximal tibiofibular joint causing peroneal nerve palsy should be remembered as a possible differential diagnosis for patient with drop foot.

Öz

Sinovyal kistler, sinovyal eklemlerden veya tendon kılıflarından köken alan iyi huylu yumuşak doku tümörlerindedir. Proksimal tibiofibular eklem sinovyal kisti, peroneal sinir felcinin nadir görülen travma dışı nedenleri arasında yer almaktadır. Bu yazıda aniden düşük ayak gelişen 50 yaşındaki erkek hastada proksimal tibiofibular eklem sinovyal kistine bağlı peroneal sinir felcinin klinik ve radyolojik bulguları sunulmuştur. Temel olarak, klinik muayene, elektronöromiyografik inceleme magnetik rezonans görüntüleme ile sinovyal kistin baskıya neden olduğu ortaya konmuştur. Sinovyal kistin cerrahi çıkarımı ve fizik tedavi ve rehabilitasyon uygulamaları sonrası olgunun klinik bulguları geriledi. Sonuç olarak düşük ayak gelişen olgularda proksimal tibiofibular eklem sinovyal kistine bağlı peroneal sinir felci gelişebileceği akılda bulundurulmalıdır.

Introduction

Peroneal nerve palsy occurs because of the fact that peroneal nerve is subject to pressure and direct trauma in fibula head and neck length especially where it is the most superficial (1-4). Mostly traumatic reasons cause this pressure (4,5). As a result of total knee arthroplasty or arthroscopic intervention to the knee, this nerve may be damaged. Casts, leg orthosis, high boots, tight socks and sitting by crossing

legs for a long time may result in pressure for nerve. Moreover, remaining in improper position for a long time during anesthesia may cause nerve pressure (3-5). One of the rare reasons is ankle injury in inversion position (1,2). Peroneal neuropathy occurring as a result of weight loss was reported in literature. Also peroneal neuropathies due to tumor or cysts were reported even rare (4,5). Synovial cyst of proximal tibiofibular joint is among the non-trauma reasons of peroneal nerve palsy which is rarely seen. Synovial cyst is known as the most common cystic formations seen in upper extremity. It is known as benign soft tissue tumor originating from popliteal fossa generally in lower extremity. Synovial cysts occur in proximal tibiofibular joint very rarely and cause peroneal nerve pressure and neurological symptoms (6). Sultan identified peroneal nerve neuropathy due to synovial cyst in a case in 1921 for the first time (7). In magnetic resonance imaging (MRI) studies synovial cyst of proximal tibiofibular joint was observed in 0.03% of cases having symptomatic knee lesion (8,9). It is recommended for the cases of peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint in the literature that in addition to anamnesis and physical examination, electromyography (EMG) examination should be performed and knee circle should be examined with MRI for the presence of synovial cyst (1-9). In the cases having peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint, if symptoms do not regress following 3-4 month conservative treatment and adequate recovery is not achieved, nerve decompression and cyst excision is recommended (2,9-11). In this paper, a case having peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint is presented guided by the literature.

Case Report

Fifty-year-old male patient having the complaint of paresthesia in right cruris lateral for the last three weeks and having sudden weakness of right ankle 10 days ago applied to our polyclinic. The patient who was a farmer did not have lumbar pain and trauma history. He did not describe a characteristic related to the presence of autoimmune rheumatic diseases in personal and family history. In the physical examination of the case, steppage gait was determined by inspection. Sensitivity of right fibula head was present with palpation. At the same time, Tinel test

performed to this region was positive. In neurological examination, hypoesthesia was present in right leg lateral, muscle strength of right ankle dorsiflexion, toe dorsiflexion and ankle eversion was at the level of 0/5. Acute partial denervation findings were detected in distal innervation muscles of peroneal nerve in EMG. Cyst formation having T1 hypointense and T2 hyperintense appearance being about 11 mm in diameter was observed near the proximal tibiofibular joint (Figure 1). The case getting the diagnosis of peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint with these findings, first we decided to treat by conservatively after then if there was not enough improvement we planned to use surgical treatment. Non-steroidal anti-inflammatory drugs, vitamin B and foot-ankle orthosis were prescribed to the case. A physical therapy program comprising of 30-session electric stimulation to ankle evertors with ankle and toe dorsiflexors and strengthening exercise was performed. It was observed in the end of the treatment that hypoesthesia continued by reducing and muscle strength of ankle dorsiflexion, toe dorsiflexion, ankle eversion increased to 2/5. It was noted that there was no sensitivity with palpation and Tinel test was negative in the examination of the patient. The patient was followed by us clinically. In month 1 and 3 control examinations of the patient following the treatment, more functional improvement

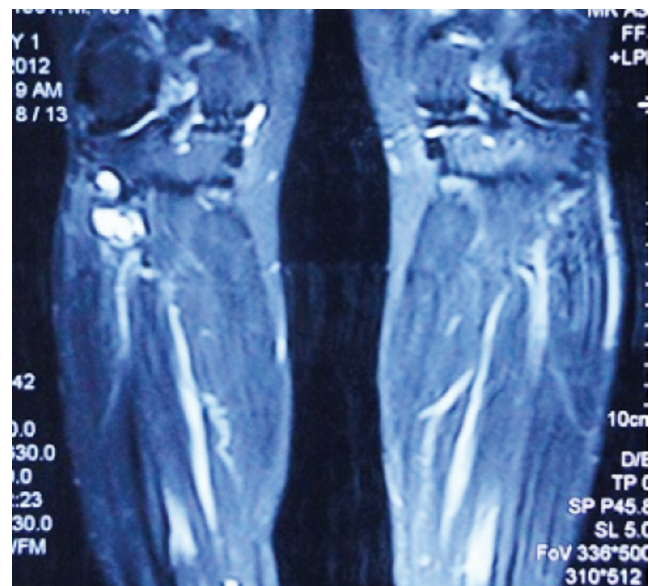


Figure 1. In knee magnetic resonance imaging of the case presented, hyperintense synovial cyst in T2-weighted section is seen

was not detected and therefore operation decision was made as a result of consultation of orthopedic clinic. In post-op month 3 control examination of the patient having synovial cyst excision, it was observed that hypoesthesia regressed completely and muscle strength of ankle dorsiflexion, toe dorsiflexion, ankle eversion increased to 4+/5. Our case was followed by us with home exercise program involving lower extremity strengthening exercises. In post-op month 6 examination, a pathological finding was not observed in EMG and MRI.

Discussion

When sciatic nerve leaves from popliteal fossa, it branches to peroneal nerve. This nerve passes behind fibula head and through fibular tunnel, it branches as superficial and deep and progresses (3-5). The most frequent peripheral nerve injury in lower extremity multiple traumas is peroneal nerve damage (5). It is mostly injured in the level of fibula head it progresses very superficially mostly or exposed to pressure. This pressure arises from traumatic reasons mostly. Traumatic reasons include proximal fibula and distal femur fractures, knee dislocations, tibial osteotomy, total knee arthroplasty, knee arthroscopy, laceration, post-operative suture pressure (1,3). Non-traumatic reasons include external or internal pressure to peroneal nerve. They also include crossing legs, squatting for a long time, casts, leg orthosis, elastic tight bandages, high boots, tight socks or trousers, extremity traction slings, excessive or long-term tourniquet use (4,5,9). In addition to these reasons, long-time ice application to knee lateral for cryotherapy, improper lying position of the patients being immobile for a long time or during anesthesia and increase of sensitivity to pressure as adipose tissue in the fibula head reduces as a result of excessive weight loss are among the reasons resulting in external pressure (12). Intraneural and extraneural tumors, hypertrophy seen in athletes in muscles, ganglion of tibiofibular joint, peroneal vascular aneurism, osteochondroma of proximal tibia and fibula, aneurismal bone cyst are the reasons of internal pressure. Peroneal nerve palsy is seen in systemic diseases such as hyperthyroidism, diabetes mellitus, vasculitis and leprosy (13,14). Other very rare reasons include extending legs procedures, anorexia nervosa, paraneoplastic syndromes, injury of ankle in inversion position and peroneal neuropathies

due to synovial cyst as our case (1,2,6,8,9,15). In a study conducted by Hersekli et al., (9) it was indicated that synovial cyst presence in proximal tibiofibular joint was defined by Lenander in 1891 for the first time and total 53 cases were reported from that date to 2004. It was demonstrated that 28 of 53 cases had peroneal nerve palsy (9). We observed that 16 cases were reported from 2004 until today as a result of our analysis with the expression of "synovial cyst of proximal tibiofibular joint" in our literature scan (2,9,15-20). As a conclusion, there are total 45 cases having peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint with our case in the literature.

Three different cases having synovial cysts but offering different clinic appearance were presented in the publication of Mortazavi et al. (15). Synovial cyst is asymptomatic of the first one of these three cases and it is sometimes symptomatic in the second case and it resulted in hypoesthesia in foot lateral and drop foot in the third case like our case. EMG and MRI examinations were used for diagnose of these cases and synovial cyst was resected in all of them as the treatment (15). In the review of Hersekli et al., (9) three cases having the diagnosis of peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint were presented. All of three cases had drop foot and all cases were operated. Our case had neurological symptoms such as drop foot and hypoesthesia in right leg lateral similar to the literature. Synovial cyst of proximal tibiofibular joint should be considered for differential diagnosis of drop foot. History and physical examination are guiding for the diagnosis of peroneal nerve palsy. Ankle weakness, hypoesthesia of cruris lateral in the history and loss of strength in ankle dorsiflexion, in toes extension in the physical examination, steppage gait and positive result of Tinel test at the level of fibula head make us consider the possibility of peroneal nerve palsy (6). EMG is used to determine the location, severity and phase of the lesion for the diagnosis. Direct graphies, computerized tomography and MRI examinations are useful for the patients getting the diagnosis of peroneal nerve palsy for analyzing the etiology. Direct graphies are used to show underlying fracture, bone tumors or deformities. Tumors leading to compression, lesions such as cyst can be examined in detail by these methods (3,4,5,21). The final diagnosis of our case was established with MRI method. In a retrospective study carried out by Kim et

al., (19) benefits of MRI findings to detect the etiology in 11 patients with the diagnosis of non-traumatic peroneal nerve palsy were analyzed. While the exact diagnosis can be established by physical examination and EMG in all of these patients, etiology of peroneal nerve palsy became prominent in 9 cases with MRI. For this reason, MRI was shown to be more valuable methods than other methods for the diagnosis of these patients (19). In the light of this information, imaging methods involving tibiofibular joint should be used to look for the presence of synovial cyst and to eliminate especially S1 radiculopathy differential diagnosis for the patients applying with drop foot.

First of all, conservative treatment methods should be applied for the treatment of peroneal nerve palsy. It should be aimed that mobility of the patient is ensured and they gain the functions again. Non-steroidal anti-inflammatory drugs and oral corticosteroids, being medical therapy agents are used to control the inflammatory process (1,15). Cyst aspiration and steroid injection can be applied to patients not having neurological symptoms; however rate of relapse of cyst is high for this treatment (9). Tricyclic anti-depressant and antiepileptic agents such as gabapentin and pregabalin contribute to the treatment for the patients having pain and paresthesia. Foot-ankle orthosis or orthopedic shoes can be used for gait disorders. Physical therapy agents and exercise treatment are beneficial for regaining function. Electric stimulation, one of the physical therapy agents is the therapy method applied to strengthen muscles innervated by peroneal nerve. Strengthening exercises are useful to increase decreased muscle strength (22). Non-steroidal anti-inflammatory drug and vitamin B was initiated to our case as the medical therapy. Foot-ankle orthosis was prescribed because of having gait disturbance and steppage gait. Electric stimulation and strengthening exercise was applied to ankle evertor muscles and ankle and toe dorsiflexor muscles. In the end of the therapy, muscle strength of ankle dorsiflexion, toe dorsiflexion, ankle eversion increased to 2/5. Three months after rehabilitation there was not any recovery in our patient so synovial cyst excision was performed. It was indicated that complete recovery could be achieved for functions in forth month of the operation in the case of peroneal neuropathy due to synovial cyst of proximal tibiofibular joint presented by Greer-Bayramoğlu et al. (22). Clear recovery in

month 3 following the operation observed in our case like the literature results. While there is not an exact consensus related to the treatment of this rare case, if neurological symptoms do not regress in month three and four in spite of the conservative treatment, it has been reported that the best treatment option is cyst resection (1,9,21). Fabre et al. (23) showed that post-operative motor recovery was 87% in a study performed with 60 peroneal nerve palsy patients. In a case report, synovial cyst recurrence was observed 18 months after the operation in a case and drop foot of one case did not improve (9). It should be considered that recurrence less than 10% can occur following cyst resection (6). Recurrence was not seen in post-operative month 6 in our case. As a conclusion, peroneal nerve palsy due to synovial cyst of proximal tibiofibular joint observed very rarely in drop foot patients should be taken into consideration. Moreover, this region should be examined with MRI to establish a diagnosis. Improvement of functions of the patients should be followed with control examinations closely and should be evaluated for the requirement of surgical operation.

Ethics

Informed Consent: We received indormed consent from the patient.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Y.T. Concept: K.B. Design: Y.T. Data Collection or Processing: I.K.B. Analysis or Interpretation: Y.T. Literature Search: I.K.B. Writing: I.K.B.

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