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CASE REPORT / OLGU SUNUMU

Pulsed radiofrequency treatment of piriformis syndrome in a pregnant patient with malignant mesenchymal tumor

Malign mezenkimal tümörlü bir gebede priformis sendromuna puls radyofrekans uygulaması

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Summary

Cancer is frequently seen in women of reproductive age. Diagnosis, management of treatment, and safety of the therapeutic approach are particularly important for these patients. Presently described is pain management in a case of pregnancy with malignant mesenchymal tumor. A 23-year-old woman in 30th gestational week presented with severe pain in right hip and back of the right thigh. Piriformis block successfully decreased pain and was followed by pulsed radiofrequency (PRF) to the piriformis muscle. PRF, as a non-neurodestructive method, is a safe and effective method to treat cancer pain in a pregnant patient.

Keywords: Cancer; piriformis syndrome; pregnant patient; pulse radiofrequency.

Özet

Kanser üreme çağındaki kadınlarda daha sık görülür. Bu hastalarda tanı, tedavi yöntemleri ve tanısal tedavinin güvenirliliği çok önemlidir. Bu olguda, malign mezenkimal tümörlü bir gebenin ağrı tedavisinin yönetimi sunuldu. Malign mezenkimal tümör tanısı olan 30 haftalık gebe (23 yaş) sağ arka uyluk ve sağ kalça ağrısı nedeniyle ayaktan tedavi amacıyla başvurdu. Tanısal priformis bloğu uygulaması sonrası ağrıda azalma oldu. Radyofrekans uygulamaları kanserli gebelerde anne-bebek güvenliği olan ve nörodestrüktif olmayan bir yöntem olduğundan tercih edilebilir.

Anahtar sözcükler: Kanser; priformis sendromu; gebe hasta; puls radyofrekans.

Introduction

Piriformis syndrome (PS) is a neuromuscular disorder in which the sciatic nerve is compressed or irritated by the piriformis muscle, causing pain in the buttocks and referring pain down the course of sciatic nerve. Yeomen described this syndrome in 1928, but the term piriformis syndrome was first used by Robinson in 1947.[1,2]

Anatomically, the piriformis muscle occupies a central position in the buttock. It originates from anterior surface of sacrum, the gluteal surface of the ilium near the posterior inferior iliac spine and capsule of adjacent sacroiliac joint. The muscle runs laterally and passes out of pelvis through greater sciatic foramen. It is attached to medial side of greater trochanter of femur via rounded tendon. The relationship between

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the sciatic nerve and piriformis muscle varies. Sciatic nerve usually passes underneath piriformis muscle, but it sometimes travels through the muscle. In some cases, some or all divisions of the nerve may also lie to either side of the muscle or pass either below or above the muscle.[3]

A history of gluteal trauma has been described in approximately 50% of cases of PS. Other factors reported to contribute to etiology of PS are sitting for long periods, pregnancy, piriformis muscle hypertrophy and spasticity in athletes, muscle fibromyositis or inflammation, variation of sciatic nerve course or branching, complications of total hip arthroplasty, and complications of cesarean section under spinal anesthesia. Aberrant courses of the sciatic nerve through the piriformis muscle have also been implicated in the development of PS.[4,5]

For women presenting with low back pain in pregnancy, a thorough history and physical examination should be carried out to differentiate pregnancy-related low back pain from other causes. Approximately 6% of low back pain and sciatica cases seen in general practice may be caused by PS.[6] Clinicians should suspect PS when patient presents with sciatica that is aggravated by sitting, lifting, or flexion, adduction, and internal rotation (FAIR) of the hip joint.[7] Sometimes an additional disease during pregnancy makes the case more complex.

Presently described is the pain management of a 23-year-old pregnant woman with low back pain and malignant mesenchymal tumor. Pain management for patients diagnosed with cancer during pregnancy requires a multidisciplinary approach. Treatment methods must be selected and performed with caution for the safety of both mother and fetus. Gestational week at diagnosis of cancer is the most important criterion when determining treatment.

Case Report

A 23-year-old female in her 28th week of pregnancy presented to the neurosurgery polyclinic with chief complaint of severe low back pain that radiated into her right buttock and right posterior thigh. A disseminated mass originating from right-sided lumbar paraspinal muscle groups down to gluteal muscle group was detected with lumbar magnetic resonance imaging (MRI). Excisional biopsy was performed and mass was determined to be malignant mesenchymal tumor. Patient also was suffering from burning pain when urinating. Urine test findings were erythrocyte 3+, negative for leukocytes, and urine culture was negative. Infectious disease department was consulted and urinary tract infection (UTI) prophylaxis treatment was started. Dysuria and pollakiuria complaints were resolved after treatment.

Two weeks after the surgery, patient applied to algology polyclinic suffering from continuous, knife-like pain in her right buttock radiating into right posterior thigh that was waking her from sleep. Diclofenac sodium and paracetamol had been ineffective and pain had become progressively worse. Physical exam revealed no tenderness of lumbar spine and all radicular provocation test findings were normal. Straight Leg Raise (SLR) test was 80°. Flexion, abduction, and external rotation (FABER) test was negative, and Laséque sign, which is defined as localized sensitivity in piriformis muscle when buttock is at 90° flexion and knee at extension, was positive. She also had an objective clinical diagnosis of PS, which included increased pain in FAIR test position. Neurological and vascular examinations showed no abnormality. Pain was identified in the piriformis muscle, over sacroiliac articulation and major sciatic incisura. Injection trigger point was found based on local twitch response and referred pain. Diagnostic piriformis muscle block was applied (5 mL of 0.125% isobaric bupivacaine) for localized pain in right buttock and posterior thigh. Trigger point injection was performed under the assumption that myofascial pain syndrome originated in the piriformis muscle. When patient returned as an outpatient 3 days after trigger point injection, visual analog scale score (VAS) had decreased from 8 to 2.

On fifth day after piriformis muscle block treatment, patient suffered from same pain in her right buttock, so pulsed radiofrequency (PRF) application was planned. Following betadine disinfection in prone position, accurate trigger point was located by means of additional physical examination. Skin wheal infiltration was performed with local anesthetic. To verify accurate needle position, 10 cm radiofrequency needles (22-gauge, straight, 5 mm active-tip

[NeuroTherm/St. Jude Medical, Inc., Little Canada, MN, USA]) were inserted into piriformis muscle. Following sensory stimulation performed at 50 Hz with potential less than 1V, PRF treatment (NeuroTherm NT1100 RF generator, St. Jude Medical, Inc., Little Canada, MN, USA) was performed on piriformis muscle (6 min, 20 ms, 2 Hz, 42°C, impedance below 400 ohms). Patient VAS score was 7 to 8 before the block, but was 1 to 2 after the block, and she was pain-free until giving birth.

Child was delivered by cesarean section at 32nd week of pregnancy. Infant's Apgar score was 9 at birth, but as it was underweight, baby was put in an incubator in the neonatal unit.

After delivery, patient complained of dyspnea and investigation for metastasis was initiated. Thorax computed tomography (CT) revealed multiple metastases in both lungs and left pleural effusion. There was no intra-abdominal metastasis on abdominal CT. According to lumbosacral CT, lumbar discs and facet joints were normal. No significant lumbar spinal canal stenosis was noted. A soft tissue mass that suggested residue or recurrence of tumor was observed at the region of the operation. Radiotherapy was applied, but patient died as a result of respiratory insufficiency 1 month later.

Discussion

Reported prevalence of back pain in pregnancy is approximately 45–50%, and increases to as much as 75% in last trimester. In one-third of pregnant women, this pain is a severe problem and has an adverse effect on the quality of life.[8]

For a pregnant woman presenting with low back pain, a detailed history and physical examination should be conducted. The goal is to exclude pregnancy-related back pain from other causes of pain such as UTI, osteomyelitis, sciatica, lumbar disk lesion or prolapse, arthritis of spine or hip, lumbar stenosis, cauda equina syndrome, spondylolisthesis, PS, etc. Also, notable points in the history such as fever, unexplained weight loss, history of trauma, history of cancer, neurological symptoms, steroid use, drug abuse or systemic disease, can help clinicians to determine other serious causes of pain. Underlying conditions might be inflammatory, infectious, traumatic, neoplastic, degenerative, or metabolic.[8,9]

Ostgaard et al. investigated whether biomechanical factors such as weight gain, abdominal circumference measure, sagittal and transverse abdominal diameter, lumbar lordosis depth, and hyperlaxity affect pain development during pregnancy. They found that increase in sagittal abdominal diameter and lumbar lordosis depth are influential. In the same study, they also found that lumbar lordosis depth in early stages of pregnancy has an effect on occurrence of lumbar pain. Furthermore, increased uterus weight may create pressure on pelvis base and lumbosacral plexus, which causes pain to spread to buttocks and legs.[10]

Etiology of PS can be primary or secondary. Primary PS is caused by anatomical variations of the muscle and is responsible for approximately 15% of PS cases. Secondary PS occurs due to other causes such as soft tissue inflammation of the muscle caused by micro/macro trauma, muscle spasm, and local ischemia.[11] During pregnancy, deep, small muscles of hip and pelvis including piriformis muscle and gluteal muscle groups become elongated and strained, a frequent but under-diagnosed cause of PS.[12]

In the present case, aside from the pregnancy, 2 conditions could have been source of pain: UTI and malignant mesenchymal tumor. Prophylaxis treatment eliminated the UTI as a possible source, but pain was still present. Malignant mesenchymal tumor at lumbar paraspinal region might cause pain by compressing spinal roots. Tumor was removed with excisional biopsy, but pain continued. Based on physical examination in algology polyclinic, PS of myogenic origin was thought to be the cause of the pain. It may have been strictly myogenic in origin or pregnancy-related. Diagnostic piriformis muscle block was effective in providing pain relief.

The main goals of observation and treatment of a pregnant patient with cancer should be saving the mother, protecting the fetus from harmful effects of the cancer treatment, and maintaining the reproductive system of the mother for future pregnancies. Thus, management of pregnant cancer patients requires a careful, multidisciplinary approach. Primary

bone and soft tissue tumors are rare in pregnancies. As a result of this rarity and limited experience, the most suitable pain treatment management method for those patients has not been clearly designated.

Treatment of PS includes application of heat, ultrasound (US) treatment, injection therapy at trigger point and combined administration of non-steroidal anti-inflammatory agent (NSAIA) and muscle relaxant. If these are not effective, piriformis muscle can be injected with local anesthetic, steroid or botulinum toxin. Traditional procedure is blind injection into most painful region; however, guidance of electromyography (EMG), CT, US or sciatic nerve stimulator can be used to identify the piriformis muscle.[13]

In studies about use of NSAIA during pregnancy, it was found that the most predominant side effect is spasm in ductus arteriosus. Premature closure of ductus arteriosus after spasm creates a great risk for fetus health and survival, and sometimes causes death.[14]

Park et al. used direct PRF treatment on case of myofascial pain syndrome (MPS) of the trapezius muscle for which trigger point injection had been sufficiently effective but of short duration. They reported that significant analgesia was obtained for 3 months after the patient received PRF treatment at both trapezius regions.[15]

Without knowing the whole effect mechanism, hypothesis is that c-Fos production is increased in posterior horn after PRF, which probably causes alterations in sodium channel activity and affects C fiber transmission. Alteration of chemical environment of trigger points (substance P, cytokines, etc.) and neurological effects (change in sensory and motor responses to spinal cord) are used to explain results of several treatment methods for myofascial pain. PFR has an effect on these factors and has the potential to provide analgesia for a longer period.[16]

A search of PubMed for "PS and radiofrequency" or "radiofrequency and pregnancy" yielded no result. According to the literature, radiofrequency ablation has been used for treatment of human fetal sacrococcygeal teratoma and intractable cancer-associated hip pain.[17,18] For this reason, it was thought that PRF could be used in this pregnant cancer case.

In the present case, regional approach was preferred in order to avoid side effects of medical drug treatment. Muscle was flexed as result of local anesthetic trigger point treatment. After positive response to diagnostic block, in order to eliminate compression of sciatic nerve, PRF was applied to piriformis muscle. Thus, we avoided methods that might be harmful to fetus, mother or pregnancy process. PRF treatment was effective and patient was pain-free until giving birth. In conclusion, it is the opinion of the authors that PRF applications are safe and can be used for management of myogenic pain in pregnant patients, but more prospective clinical studies are necessary to compare its effectiveness with other methods.

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