Agri 2024;36(3):194–197
doi: 10.14744/agri.2022.60486

CASE REPORT

Bilateral percutaneous cervical cordotomy for cancer pain: A case report

Kanser ağrısında bilateral perkütan servikal kordotomi: Olgu sunumu

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Summary

Cancer is a systemic and progressive disease, and pain is a serious problem for patients. Cordotomy is one of the most effective treatments for refractory cancer pain. Bilateral percutaneous cervical cordotomy can be performed in patients with bilateral extremity pain. Accordingly, this case report discusses the use of bilateral cervical percutaneous cordotomy in the treatment of refractory cancer pain based on a 69-year-old woman with soft tissue sarcoma.

Keywords: Bilateral; cancer; cervical; cordotomy; pain; percutaneous; resistant; secondary.

Özet

Kanser, sistemik ve ilerleyici bir hastalıktır. Ağrı, hastalar için ciddi bir problemdir. Kordotomi, dirençli kanser ağrısı için en etkili tedavi yöntemlerinden biridir. Bilateral perkütan servikal kordotomi, bilateral ekstremite ağrısı olan hastalarda yapılabilir. Buna göre, bu olgu sunumunda, yumuşak doku sarkomlu 69 yaşında bir kadın olgu temelinde dirençli kanser ağrısının tedavisinde bilateral servikal perkütan kordotomi kullanımı tartışılmıştır.

Anahtar sözcükler: Ağrı; bilateral; dirençli; kanser; kordotomi; perkütan; servikal.

Introduction

Cancer and cancer-related disorders continue to be a major public health concern. There is a wide range of treatment options that clinicians can use in the treatment of cancer pain, ranging from pharmacological treatments to invasive interventions. High-risk invasive procedures are mostly used in cases where simple treatment options do not provide any results. Accordingly, cordotomy is generally preferred in patients with limited life expectancies.[1] Spinothalamic cordotomy, for instance, is commonly used in patients with cancer pain that could not be adequately treated with other invasive methods, and, as a method that aims to interrupt the spinothalamic tract ascending contralaterally to the painful side, it has proven very useful. There are also cases where bilateral cordotomy may be required, and, in which case, it is applied at least 1 week after the first procedure.[2]

In this context, a patient who underwent bilateral percutaneous cervical cordotomy with the diagnosis of soft tissue sarcoma on different occasions is presented herein as a case report.

Case Report

The case presented herein is a 69-year-old female patient diagnosed with soft tissue sarcoma 8 years ago. The patient underwent amputation from the right femur proximal following her diagnosis. She had more pain in her left leg and right thigh, which was manifested as burning and numbness, and also as electric shock on the right side in particular. The pain commonly occurred in the form of attacks, lasting as long as an hour. She reported waking up from her sleep at night due to these pains. Her Visual Analog Scale (VAS) pain score was determined as 10. At the time she presented

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Submitted *(Başvuru):* **30.11.2021** **Revised** *(Revize):* **13.12.2021** **Accepted** *(Kabul):* **02.01.2022** **Available online** *(Online yayımlanma):* **04.07.2024**

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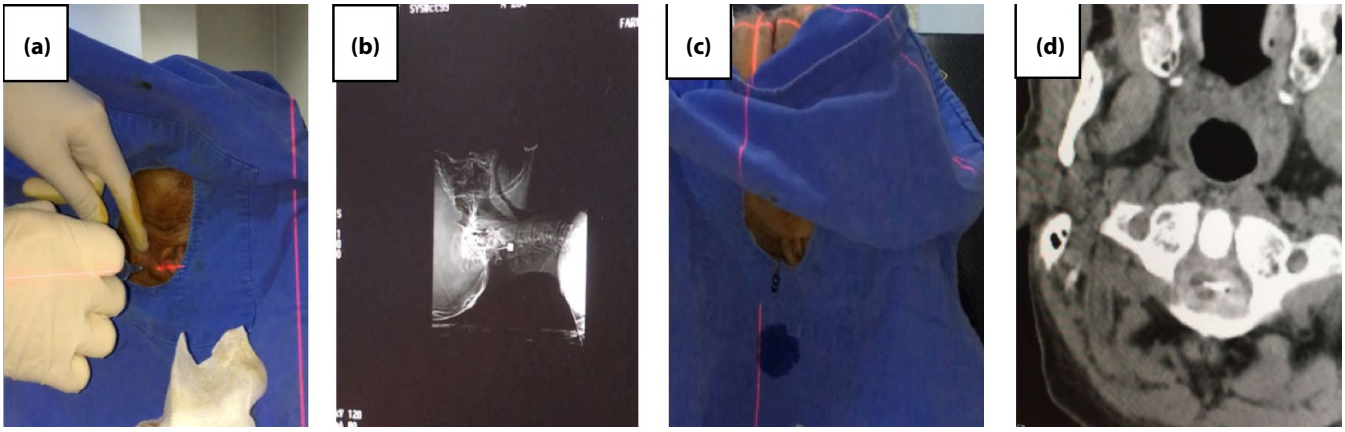

Figure 1. (a) Use of local infiltration anaesthesia between the first and the second cervical vertebrae **(b)** CT image of the needle while between the C1 and C2 **(c)** As the needle passed through the dura, cerebrospinal fluid discharge has occurred **(d)** View of the cordotomy electrode in the anterolateral part of the spinal cord.

to the clinic where this study was conducted with complaints of pain, she had been using 600 mg of pregabalin, 125 mcg of fentanyl, and 200 mcg of sublingual fentanyl. Various invasive interventions, i.e., lumbar sympathetic block and injection of epidural steroid, had been performed in the outpatient clinic. It was determined that she has a history of hypertension. Her medical examination revealed that her right hip joint range of motion was limited and that her muscle strength was 5/5. The dosage of her medical treatment was readjusted based on these findings. In her control examination, she was scheduled to have percutaneous cervical cordotomy, an advanced invasive procedure. In this context, first, left percutaneous cervical cordotomy procedure was performed for the treatment of the right thigh pain. Secondly, 20 days after the completion of the first procedure, right percutaneous cervical cordotomy procedure was performed for the treatment of the left lower limb pain. Procedures were performed with the patient in a supine position on the operation table. She was provided oxygen using a nasal cannula. Her vital signs were monitored. The needle entry area was sterilized, and the head of the needle was fixated with the help of tape. She was administered 0.03 ml/kg midazolam intravenously. The C1-C2 (first and second cervical vertebrae) range was determined based on the computed tomography (CT) imaging, and the area just below the mastoid protrusion was marked. Local anesthesia was applied to the marked area using 2% lidocaine (Fig. 1a). Under the guidance of CT, a 20-gauge needle was inserted up to the contralateral C1-C2 range (Fig. 1b). Following the discharge of CSF (cerebrospinal fluid) (Fig. 1c), 7 cc iohexol and 3 ml serum saline mixture were injected into the subarachnoid space via barbotage. Subsequently, a 2 mm active-tip cordotomy electrode was passed through the guiding needle and inserted towards the anterior part of the spinal cord (Fig. 1d). Simultaneously, the impedance of the electrode was constantly monitored and was measured as 1312 ohms at the time the electrode tip was properly placed as determined by CT. She was administered electrical stimulation with sensory and motor intensity of 2–50 Hz. Sensory changes and motor contractions were recorded during stimulation. Accordingly, a sensory response was obtained on the right thigh at 0.3 volts and 50 Hz. She was administered radiofrequency current at 80 °C for periods of 10, 20, and 30 seconds, respectively. Following the completion of the procedure, her VAS pain score was determined as 0. She was kept under observation for 5 hours after the procedure, during which she had no complications. During her follow-up visit 20 days later, her right thigh VAS pain score was determined to be 0. Twenty days after the first procedure, a similar procedure was performed for the left lower limb. A sensory response was obtained on the left thigh at 0.2 volts and 50 Hz, and a motor response was obtained at 0.3 volts and 2 Hz. She was administered radiofrequency current at 80 °C for periods of 10, 20, and 30 seconds, respectively. Her VAS pain score was determined as 0 following the completion of the second procedure, and she did not have any complications. Her VAS pain scores in both lower extremities were determined to be 0 during her 1-month follow-up examination. She did not have any complications in the postoperative period.

Discussion

The percutaneous technique was developed by Mullan et al.[3] in 1963 and radiofrequency (RF) current was used by Rosomoff et al.[4] to produce the lesion in 1965. The introduction of computed tomography (CT)-guided percutaneous cordotomy, which was described by Kanpolat et al.,[5] has led to greater safety and efficacy. CT-guided percutaneous cordotomy is deemed one of the most useful procedures for patients that have unilateral pain associated with cancer, as the pain in 95% of the patients that undergo CT-guided percutaneous cordotomy is sufficiently reduced following the completion of the procedure. Cordotomy is the method of preference in resistant cancer pain. Accordingly, patients with unilateral cancer pain who are unresponsive to medical treatment constitute the ideal group of patients for cordotomy.[2] It has been stated in the literature that patients with unilateral upper trunk pain secondary to lung cancer, mesothelioma, or pancoast tumors and unilateral lower trunk pain due to malignancies may benefit from CT-guided unilateral percutaneous selective cordotomy,[6] whereas patients without pulmonary dysfunction, resistant bilateral lower and/or upper extremity cancer pain may benefit from CT-guided bilateral percutaneous cordotomy.[7]

Coagulation disorders, respiratory failure, spinal abnormalities, and psychiatric disorders are contraindications for the use of percutaneous cervical cordotomy.[8] Additionally, percutaneous cervical cordotomy is not suitable for those with low lung capacity and with a life expectancy of less than 3 months.[9] The most common complications observed in association with percutaneous cordotomy are Claude Bernard-Horner Syndrome or Horner syndrome, urinary retention, arterial hypotension, sensory ataxia, hypotonia, and ipsilateral hemiparesis. Motor and sphincter or sexual disorders are manifested in less than 10% of the cases. Other less common complications associated with percutaneous cordotomy include respiratory dysfunction and sleep apnea (Ondine Syndrome), the latter being more commonly observed in association with bilateral percutaneous cordotomy.[10] Furthermore, there is the risk that other pains, which were previously masked, may emerge or that "mirror pain," that is, pain on the contralateral side, may develop. The incidence of such pain syndromes ranges between 9% and 63%.[11]

In a study by Kanpolat conducted in 2009 with 207 patients who underwent cordotomy, 5 cases had temporary motor paralysis and 5 had ataxia, yet no mortalities were observed. Additionally, in the same study, transient hypotension and transient urinary retention associated with bilateral cordotomy were observed in 3 and 2 cases, respectively. On the other hand, dysesthesia, the only permanent complication, was observed in 4 (1.8%) patients.[12] In another study, which was conducted by Yegul in 2003 to investigate the efficacy and complications of bilateral percutaneous cordotomy, 4 of the 9 patients who had bilateral percutaneous cordotomy developed mirror pain after the first procedure, whereas the remaining 5 patients had contralateral pain due to new pain sites. Yet, complete or satisfactory pain relief was reported in all these patients following the completion of the second procedure. No complications were observed in 4 patients, whereas 1 patient developed a transient motor deficit following the first procedure. Other complications, i.e., nausea/vomiting, headache, ipsilateral neck pain, and postcordotomy dysesthesia, were mild and transient.[2] The results reported by both Kanpolat and Yegul indicate that the success rate in respect of the second side was similar to the rate in respect of the first side, as both procedures featured low complication rates. In comparison, in the case presented herein, the VAS score of the patient was found to be 0 after both procedures and no complications were observed in association with either of the two procedures.[12,2]

CT-guided percutaneous cervical cordotomy remains an effective and safe method in the treatment of cancer pain resistant to medical treatments. Additionally, taking into consideration that cancer is a systemic and progressive disease, CT-guided percutaneous cervical cordotomy can be repeated if the pain reemerges in the same area or elsewhere in the body. In conclusion, bilateral percutaneous cordotomy should be considered as one of the methods of preference to be used in cancer-resistant bilateral limb pain at different times given its positive effect on the patients' quality of life.

Conflict-of-interest issues regarding the authorship or article: There is no conflict of interest.

Informed Consent: Written informed consent was obtained from the patient.

Use of AI for Writing Assistance: There was no use of artificial intelligence for authoring.

Peer-rewiew: Externally peer-reviewed.

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