

Case Report

Trial Spinal Cord Stimulator Reimplantation Following Lead Breakage after Third Birth

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Background: Many studies have reported lead migration and breakage as complications of epidural spinal cord stimulation. In cases where rapid changes in physique such as those caused by pregnancy are expected, it is unclear whether extra consideration regarding possible adjustments and care to avoid complications such as lead breakage are required.

Objective: This article presents a case in which spinal cord stimulation was used to manage these complications in a woman during the perinatal period.

Design: Case report

Setting: Pain management clinic

Methods: The patient was a 36-year-old female, approximate weight of 100 pounds, and 5-foot 1 inch in height, whose chief complaint was lower back and bilateral leg pain. The pain could not be alleviated by conservative therapies such as nerve blockade, oral medications with non-steroidal anti-inflammatory drugs, antidepressants, anticonvulsants or physical therapy. A spinal cord stimulator was implanted at another facility, which relieved the pain. The patient subsequently had 2 vaginal births without any problems relating to the stimulation sites, and both infants were healthy. She experienced lead breakage after the third vaginal birth that led to the subsequent reimplantation procedure.

Results: The patient had 2 subsequent vaginal births following the initial implantation with no problems related to the stimulation sites, and both infants were healthy. At age 34, following her third vaginal birth, the stimulator became ineffective and was removed. The withdrawn lead wire was found to be broken in 2 places.

Limitations: A case report.

Conclusion: Pregnancy following implantation of a spinal cord stimulator might result in lead breakage as abdominal girth increases. The present case exemplifies how pregnancy following implantation of a spinal cord stimulator might cause lead breakage as abdominal girth increases. Extra care is required to prevent lead breakage when anchors are fixed.

Key words: spinal cord stimulator, reimplantation, lead breakage, pregnancy

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Since Shealy, Mortimer, and Reswick (1) reported the analgesic efficacy of epidural spinal cord stimulation therapy for cancer-related pain in 1967, it has been administered for various types of chronic or refractory pain (2,3). Many studies have reported lead migration and breakage

as a complication of this therapy, but none have focused on women during the perinatal period. We report here the case of a woman who had a spinal cord stimulator implanted at another facility; a reimplantation procedure was performed when lead breakage occurred after her third birth.

CASE REPORT

The patient was a 36-year-old woman (weight: 100 pounds, height: 5-foot 1 inch) whose chief complaint was lower back and bilateral leg pain. At the age of 27, she had procedures performed for lumbar disc herniation, but the pain worsened following these operations. The pain could not be improved by conservative therapies such as nerve blockade, oral medications with non-steroidal anti-inflammatory drugs, antidepressants, anticonvulsants or physical therapy. The patient was examined by an orthopaedist, who evaluated postoperative conditions of her lumbar spine, but further invasive surgical interventions were not recommended. At age 28, a spinal cord stimulator, Quad Lead, Medtronic Irel III pulse generator (Medtronic, Minneapolis, MN), was implanted at another facility, which relieved the pain. The patient subsequently had 2 vaginal births without any problems related to the stimulation sites, and both infants were healthy. At age 34, following her third vaginal birth, her infant was healthy, but the stimulator became ineffective and the pain intensified. At age 36, the patient consulted our department regarding the possibility of a reimplantation procedure.

X-ray images taken at the time of initial consultation (Fig. 1) revealed bending of the lead wire at the putative breakage site. Because analgesics such as non-steroidal anti-inflammatory drugs exerted only limited effects and the patient expressed strong interest in 2 surgical procedures, the broken spinal cord stimulator was withdrawn 45 days later and a reimplantation pro-

cedure was performed 50 days later. As shown in Fig. 2, the withdrawn lead wire was broken in 2 places. The pulse generator was implanted in the right lower abdomen. Following the procedure, lower back and leg pain were reduced, and the patient was discharged.

DISCUSSION

With regard to complications of spinal cord stimulation therapy, Cameron (4) reports the following: lead migration (13.2%), lead breakage (9.1%), infection (3.4%), hardware malfunction (2.9%), unwanted stimulation (2.4%), battery failure (1.6%), and pain over implant (0.9%). In addition, Kumar and colleagues (5) report that breakage occurs primarily at sites where leads are anchored to the supraspinal ligament. Figure 2 shows that the disconnection was related to the anchor in our patient as well, and we therefore believe that extra care is needed when fixing the anchor.

Turner (6) reports that changes in physique such as weight gain can result in lead breakage. The break in the present patient occurred following pregnancy and birth, thus we believe that an increase in abdominal girth was the cause. Because the breaks involved the anchor—and, as shown in Fig. 3, the electrode position at the time of consultation at our facility appears to be identical to the initial electrode position—we assume that as abdominal girth increased, strong pressure was exerted on the lead wire between the abdominal area and pulse generator, causing it to break. This might be one of the reasons why, as reported by Kumar and col-

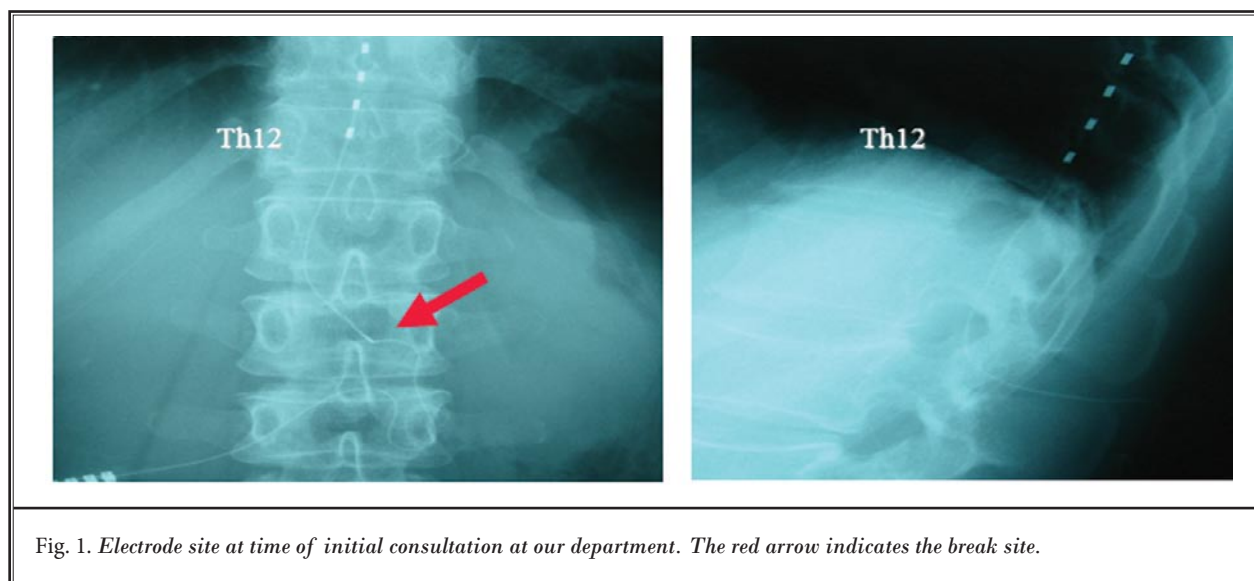


Fig. 1. Electrode site at time of initial consultation at our department. The red arrow indicates the break site.

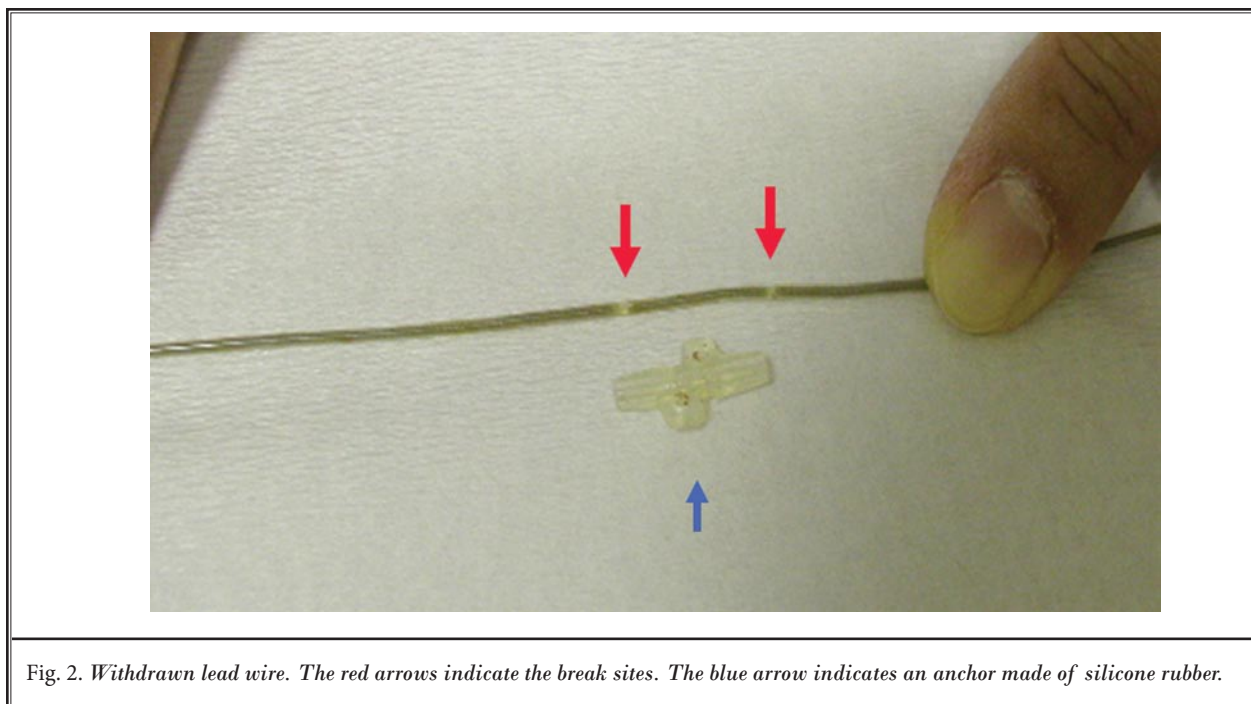


Fig. 2. Withdrawn lead wire. The red arrows indicate the break sites. The blue arrow indicates an anchor made of silicone rubber.

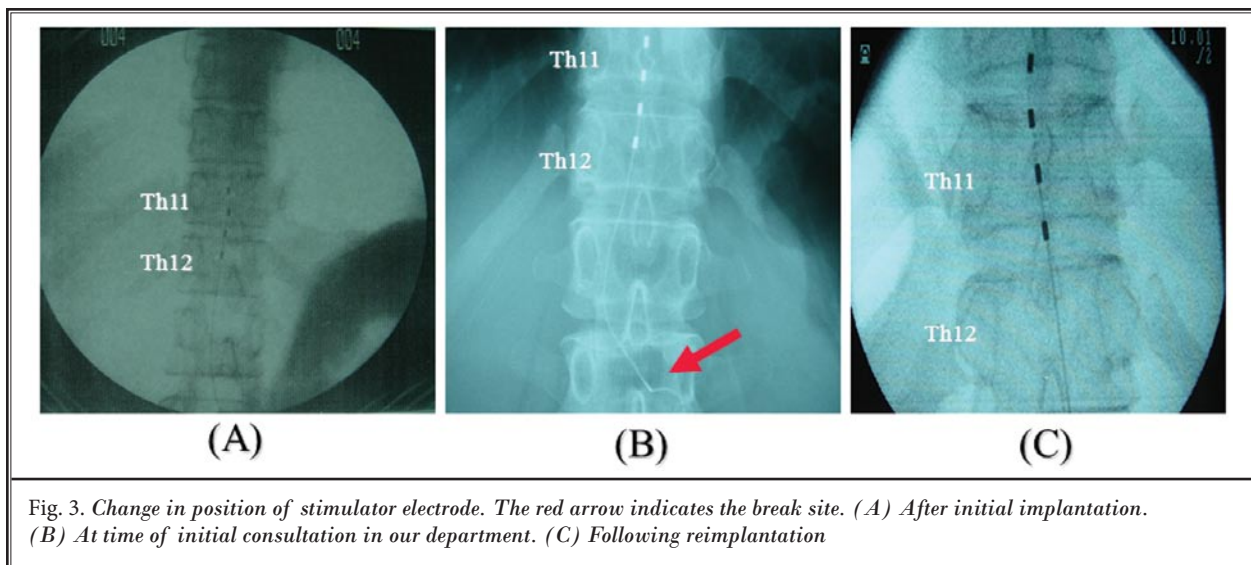


Fig. 3. Change in position of stimulator electrode. The red arrow indicates the break site. (A) After initial implantation. (B) At time of initial consultation in our department. (C) Following reimplantation

leagues (5), breakage occurs primarily at sites where leads are fixed to the supraspinal ligament.

Few studies have reported the use of spinal cord stimulation therapy in pregnant women. Of these, Segal (7) and Hanson and Goodman (8) have reported spinal cord stimulation therapy to cervical vertebrae for pain in the upper extremities. In the present patient, stimu-

lation appears to have been performed for short periods only during intense lower back and leg pain, and no notable complications were observed in either the mother or fetus. However, no reports exist on spinal cord stimulation therapy at the level of the thoracolumbar spine during the perinatal stage, and its safety for pregnant women and their infants has not been

established. Furthermore, there may be an increased risk of breakage resulting from a pregnancy-induced increase in abdominal girth, as demonstrated in the present patient. We therefore believe that this therapy cannot be recommended for women who might become pregnant.

We have reported the case involving a woman treated with epidural spinal cord stimulation who ex-

perienced lead breakage after giving birth for the third time; a trial spinal cord stimulator reimplantation procedure was successfully performed. This case demonstrates that pregnancy following implantation of a spinal cord stimulator may cause lead breakage as abdominal girth increases. We therefore believe extra care is needed when fixing anchors to prevent lead breakage.

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