INTRODUCTION

Neuromodulation

- Spinal cord stimulators have been used to treat a variety of pain conditions including chronic neuropathic limb pain as described in this case.
- A neuromodulation trial typically involves lead placement and stimulation in the lower thoracic spinal levels.
- Impedance values of surrounding tissues in contact with the stimulator leads help determine the amount and distribution of current needed for the surrounding nerves.
- A majority of trials are without complication or drastic fluctuations in impedance values.

Epidural Lipomatosis

- Spinal epidural lipomatosis is a rare pathological overgrowth of adipose tissue in the extradural space.
- There is an association with exogenous cortisol use and endogenous cortisol overproduction.
- There is limited published data on the role these lipomatoses may play in a failed neuromodulation trial.

Purpose

- To present a case on spinal epidural lipomatosis and its effect on impedance values during a neuromodulation trial.

CASE REPORT

Subject

- 43 year old female with a past medical history of chronic low back pain and prior lumbar fusion presented with bilateral lower extremity dysesthetic pain radiating from her waist to her feet.
- Neuromodulation was recommended in an attempt to alleviate the patient's symptoms.

Procedure

- Dual neurostimulator octrodes were placed percutaneously through the T12-L1 intralaminar window and advanced into the dorsal epidural space along a bilateral paramedian line just lateral to the spinous process.
- The leads advanced easily up to the mid T9 level and then encountered difficulty advancing at the superior endplate of the T8 vertebral body.

Neurostimulation Trial

- Trial stimulation revealed impedance values within normal limits (300-500mΩ) over the T9 vertebral body.
- The impedance values over the T8 vertebral body were significantly higher (1200-1400mΩ).
- The impedance values dropped to within normal limits when advanced over the T7 vertebral body.
- Placement at the T7 level caused a pattern of abdominal stimulation to occur, with a gap of stimulation coverage from the waistline to the popliteal fossa.
- Fluoroscopic imaging confirmed proper placement of the electrodes in the dorsal epidural space.
- The abnormally high impedance was considered to be due to technical error or faulty neurostimulator modulator.
- Intraoperative stimulation trials successfully covered the patient's pain pattern from the popliteal fossa inferior to the bilateral feet. It was unsuccessful at covering pain patterns from the waistline inferior to the popliteal fossa.

Outpatient Trial

- Patient continued to experience good stimulation pain coverage from the popliteal fossa to the feet bilaterally but lacked coverage between the gluteal region and the popliteal fossa.
- Trial deemed unsuccessful due to failure to cover the patient's neuropathic pain pattern adequately.
- Prior to lead removal, AP and lateral radiographs were obtained and reconfirmed the placement of the leads.
- Leads removed one week after implant without complication.

CONCLUSION

- Epidural lipomatosis can greatly increase impedance values and should be considered when physicians encounter high values during a neuromodulation trial.
- Thoracic spinal epidural lipomatosis may also contribute to neuromodulation trial failure rates due to inadequate pain relief.

REFERENCES

1. Fogel GR, Cunningham PV, Eaves SR. Spinal epidural lipomatosis: case reports, literature review and meta-analysis. The Spine Journal 2005; S: 203-211.