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Utilization of CT for InterStim sacral neuromodulation lead placement in a patient with morbid obesity

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Stress, urge, and mixed urinary incontinence are associated with obesity [1]. InterStim sacral neuromodulation has been demonstrated to be a successful treatment modality for refractory urge incontinence in both normal and obese women [2]. Meissnitzer et al. previously described utilizing CT guidance in sacral neuromodulation lead placement primarily in patients with altered bony anatomy [3]. To our knowledge, we present the first case utilizing CT fluoroscopy guidance for InterStim lead placement due to morbid obesity.

A 60-year-old G2P2 woman with morbid obesity (400 lb [181 kg], BMI 57.4 kg/m^2) originally presented in May 2016 for urge-predominant mixed urinary incontinence and nocturia. She had 12–16 voids during the day, 5–6 voids during the night and 2 urgency incontinence episodes daily. The severity of symptoms was validated on the Medical, Epidemiologic, and Social Aspects of Aging questionnaire (83.3% for urge urinary symptoms). She subsequently failed conservative measures, multiple pharmacological agents, pelvic floor physical therapy, and percutaneous tibial nerve stimulation. Intravesical Botox injection was declined owing to concerns of urinary retention requiring self-catheterization, given her limited mobility and body habitus.

In May 2018, she elected to undergo stage 1 InterStim implantation for refractory overactive bladder. Owing to concerns of image quality, survey fluoroscopy was conducted. Postero-anterior view of the sacrum was successfully obtained demonstrating normal bony anatomy. However, adequate visualization of the anterior sacral table on lateral view was unsuccessful and the procedure was aborted (Fig. 1).

Following discussion with Interventional Radiology, the decision was made to attempt CT-guided stage 1 InterStim lead placement. The advantages of CT include calculation of the appropriate needle angulation through the foramen, and accommodation of a larger patient with good penetrance through tissue. The GE Optima CT580 could accommodate a patient up to 650 lb (295 kg) and settings include a 16-slice CT image. The patient was positioned, prepped, and draped (Fig. 2) and the sacral lead was successfully placed after CT-guided mapping of the trajectory (Fig. 3). At initial postoperative (testing phase) follow-up, she reported voiding 5–6 times per day, twice at night, and had no incontinence episodes. Implantation of the IPG (stage 2) was completed 1 week later in the standard fashion in the operating room. At her 2-week postoperative visit, she reported voiding every 3–5 h during the day, with incontinence episodes 1–2 times weekly.

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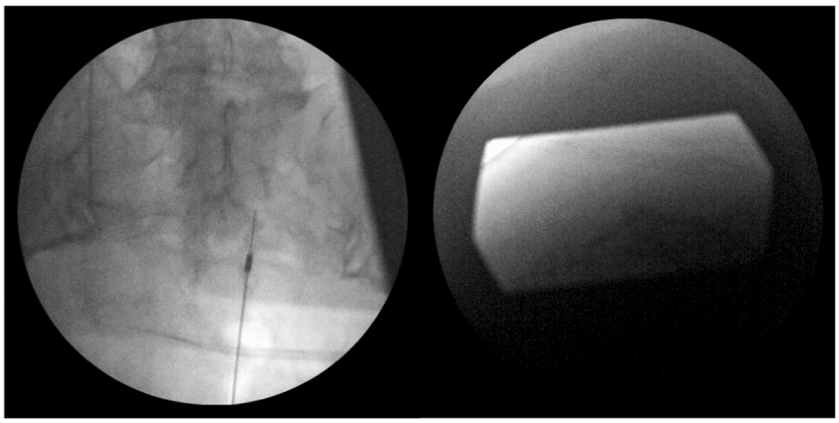

Fig. 1 *Left*: postero-anterior view of sacrum demonstrating normal bony anatomy. *Right*: inadequate lateral view of anterior sacral table. Imaging acquired utilizing GE OEC 9900 Elite C-Arm Fluoroscope with the patient in prone position on a Jackson spinal table

Fig. 2 Patient positioning during CT-guided procedure utilizing GE Optima CT580

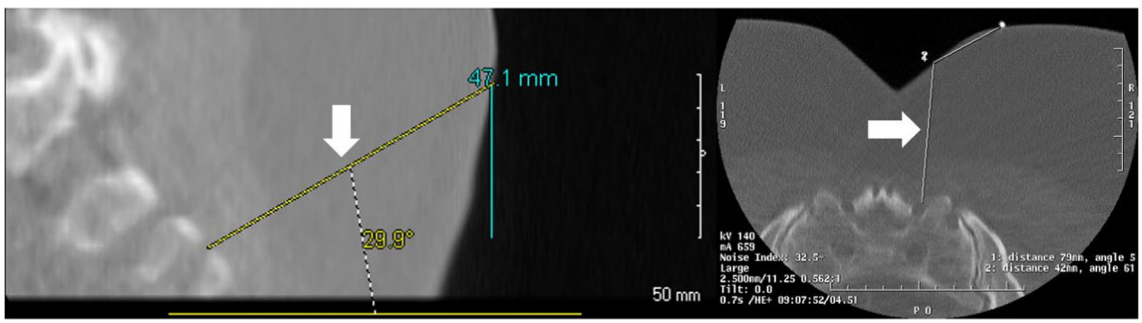

Fig. 3 Sagittal and axial CT slices templating planned trajectory of lead into S3 neural foramen in both planes (*arrows*)

Compliance with ethical standards

Conflicts of interest None.

Consent Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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