SPINE INTERVENTION SOCIETY
SAFETY PRACTICES FOR INTERVENTIONAL PAIN PROCEDURES

SACRAL LATERAL BRANCH RADIOFREQUENCY NEUROTOMY

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Sacral lateral branch radiofrequency neurotomy (LBRFN) is a treatment for pain arising from the sacroiliac joint or its posterior ligaments. The following safety practices have been developed to highlight the important elements in the safe performance of interventional pain procedures. Adherence to these practices will help decrease the risk of preventable complications.

PERSONNEL

- Only physicians trained in the performance of lateral branch radiofrequency neurotomy should perform this procedure.
- Appropriately trained personnel are needed for the operation of the fluoroscopy unit and to assist the physician.

CONTRAINDICATIONS

ABSOLUTE

- An active systemic infection or a localized infection within the procedural field
- Uncooperative patient
- Allergy to medication(s) that cannot safely be mitigated by pre-treatment
- Pregnancy

RELATIVE

- There are no known cases of clinically significant bleeding after lateral branch RFN. There have not been large-scale studies to accurately define the risk. Theoretically, the risk of serious bleeding is low as only superficial tissues are traversed during this procedure. In this context, the risks and benefits of discontinuing anticoagulants should be discussed with the patient, in consultation with the patient's doctor who is responsible for the prescription.
- Spinal hardware is not a contraindication to LBRFN, but its presence may complicate needle placement. The risk of heating spinal hardware applies as well. Patients should be instructed to report any pain or other adverse sensations during the procedure. Should such sensations occur, the procedure should be halted and their cause ascertained. If the sensations cannot be averted, the procedure should be aborted. Impedance and temperature at the electrode tip should be monitored. Physicians may consider monitoring tissue temperature in the case of RFN lesions applied in close proximity to surgical hardware, particularly if there is concern for a possible skin burn in a patient with minimal soft tissue overlaying the surgical hardware.
- Caution is advised in patients who have cardiac pacemakers and defibrillators. If a decision is made to proceed with radiofrequency neurotomy in these patients, physicians should consider the following recommendations to maximize safety and minimize complications:
  - Educate the patient on the potential hazards and risks of radiofrequency neurotomy in the setting of a pacemaker or defibrillator.

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- Ensure the patient is followed by a cardiologist/electrophysiologist and obtain prior approval from the provider, which should be documented in the patient's medical record.
- If recommended by a cardiologist or electrophysiologist:
  - Have on-site support for interrogation of the cardiac device during the procedure in the event that reprogramming of the device is required.
  - Place a magnet over the device during the procedure to prevent triggering the device by radiofrequency energy.
  - Remove the magnet or use an external defibrillator or pacing electrodes in case of cardiac arrhythmias during the radiofrequency neurotomy procedure.
  - Use bipolar RFN lesioning.

- Other implantable devices, such as spinal cord stimulators and deep brain stimulators, should be turned off during the procedure. The stimulator should be restarted after the procedure to ensure proper functioning. The grounding pad should be placed such that the path for the electrical current is as far as possible from the device. The procedure should be abandoned if the risk of stimulator electrode heating during the neurotomy cannot be eliminated.
- Immunosuppression

SEDATION

- Sedation is not intrinsically necessary for lateral branch radiofrequency neurotomy, but if employed in unique circumstances (e.g. movement disorder, cases of extreme anxiety, previous vasovagal response), the patient should remain able to communicate pain or other adverse sensations or events.
- The decision to use sedation should be made on a case-by-case basis.
- If the physician performing the procedure decides to administer and supervise the sedation, they should be trained and qualified to do so. In these situations, a separate healthcare provider is required to assist with the administration of the medications and monitoring of the patient.
- Resuscitation drugs, monitoring equipment, and oxygen must be available if sedation is utilized.

SAFE, ASEPTIC PRACTICES

- Strict aseptic technique should be followed at all times as they pertain to the facilities, materials, patient preparation, physician preparation, personnel, and injectate/syringe preparation. Examples include, but are not limited to:
  - Hand-washing and aseptic precautions
  - Skin overlying the target region should be prepared for an aseptic procedure, preferably using chlorhexidine in alcohol in alcohol. The area should then be draped to create a sterile field, not only for the physician's hands but also for the electrodes and cables that will be brought into the field.
  - A face mask and sterile gloves must be worn during the procedure.
  - Sterile single-use syringes and needles are required, and single-dose vials should be

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utilized when available. Centers for Disease Control and Prevention (CDC) guidelines for safe injection practices must be followed.
  - Acquisition, storage, and utilization of medications should be in accordance with relevant governmental guidelines such as those of the CDC in the United States.
  - Single-use or reusable probes are appropriate if proper sterilization techniques are employed between patients and procedures.

IMAGING

- Use of image guidance is necessary to ensure appropriate needle placement.
- The imaging technique should follow the ALARA protocols (as low as reasonably achievable) to minimize x-ray exposure for both the patient and the healthcare team.
- Fluoroscopic guidance has been used in the primary literature investigating the safety of lateral branch radiofrequency neurotomy. CT scan is an extension of fluoroscopic guidance with increased cost and radiation exposure and is not widely available. There is no current, robust evidence validating the use of ultrasound, and its use is not recommended until such evidence becomes available.
- Obtain image(s) showing final electrode position in at least two views: an AP view that maximizes the crispness of the lateral edge of the sacral foramen at a particular level and a lateral view).
- A neurotomy should not be initiated if imaging does not allow visualization of the bony landmarks and location of the electrode tip. In the lateral view, the needle tip should not extend anterior to the posterior surface of the sacrum.

NEUROTOMY

- A dispersive pad should be completely adhered to the skin with the long axis of the pad facing the active RF electrode to minimize risk of a dispersive pad skin burn. The pad should be placed on the contralateral lower leg if possible with the path of current from the ground plate to the RF electrode tip aimed away from implanted hardware and other implanted electronic devices.
- The procedure should be halted if the patient complains of any pain or other sensation indicative of nerve root or ventral ramus involvement during temperature escalation or neurotomy. The generator should be turned off and causes evaluated and corrected. If such symptoms persist, the procedure should be aborted.
- Sensory and motor testing is not required for either safety or efficacy if appropriate care is taken in electrode placement.
- Lesioning above 90°C is not recommended due to the risk of cavitation resulting in inconsistent lesion sizes and shapes.

LUMBAR LATERAL BRANCH CONVENTIONAL RADIOFREQUENCY NEUROTOMY

- For RFN of the L5 dorsal ramus, the electrode should avoid the ventral quarter of the neck of the superior articular process to avoid unnecessarily capturing the lateral branch or intermediate branch in the lesion. Further advancement beyond this point can directly damage the ventral ramus or spinal nerve.
- Regardless of the technique used, in order to prevent spinal nerve root injury, the electrode should not be permitted to enter the lateral foramen.

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POST-PROCEDURE MONITORING/FOLLOW-UP

- Patients should be monitored for an appropriate time following the procedure depending upon the nature of the intervention and the agents utilized.
- Provide detailed oral and written discharge instructions to patients that outline:
  - activity restrictions for the immediate post-procedure period (e.g. do not operate a motor vehicle or machinery for the remainder of the day),
  - potential expected side effects that may occur immediately post-procedure and in the first few days following the procedure (e.g. pain at procedure site),
  - symptoms that merit immediate medical attention, and
  - when to resume usual medications and anticoagulants if discontinued for the procedure.
- Ensure patients have a follow-up plan.

SOURCES

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DISCLOSURES

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Any position in a healthcare, medical, or physician society/association (committee, board, workgroup/taskforce, etc.): World Institute of Pain, Education Committee.
Travel Expenses: World Institute of Pain - FIPP Exam Travel Expenses.
Other: Pain Practice Journal - Editorial Work Reimbursement.

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No Financial Relationships to Disclose.

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THE INTERVENTIONAL SPECIALISTS' FREE RESOURCE TO HELP DECREASE THE RISK OF PREVENTABLE COMPLICATIONS

For additional information about the indications and technical aspects that yield improved treatment outcomes, refer to the *SIS Practice Guidelines for Spinal Diagnostic and Treatment Procedures*.

PRACTICE GUIDELINES
FOR SPINAL DIAGNOSTIC AND TREATMENT PROCEDURES

Second Edition
Edited by Nikolai Bogduk MD, PhD

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