studies that used single blocks as the criterion standard, but also those studies that accepted less than complete relief of pain as the definition of a positive block. Doing that would reduce the literature to only the study of Dr. Laslett [2]. A meta-analysis of a single study seems irrational to me.

Dr. Laslett's second point is worthy of exploration. Physical examination of the sacroiliac joint may have greater power when performed in context rather than in isolation. There may be other clinical features that serve to narrow the population in which sacroiliac joint pain should be expected, and in which physical examination of the joint might have higher likelihood ratios. The requirement here is for quantitative data on how valid each step is in a complex diagnostic algorithm. However, in this regard, some people might argue that it takes less time to perform a diagnostic block than it takes to complete a comprehensive physical examination, and a block gets straight to heart of the matter.

At this stage, Dr. Laslett provides food for thought, but his comments do not detract from the Appropriate Use Criteria [3]. Regardless of what the exact values of likelihood ratios are, the presently available data show that it might be efficient to restrict diagnostic blocks to patients who are positive for sacroiliac joint signs. In closing, though, I remind readers that this discussion is pertinent only to the diagnosis of sacroiliac joint pain [4]. There are still no data on the prevalence of sacroiliac ligament pain and its diagnosis by physical examination. For that condition, lateral branch blocks are the first and only diagnostic test.

Nikolai Bogduk, MD, PhD, DSc
Spine Section Editor

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LETTER TO THE EDITOR

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Erector Spinae Plane Block at the Lower Thoracic Level for Postoperative Pain Management After Spinal Cord Stimulation Implantation

Dear Editor,

Spinal cord stimulation (SCS) is a method used to control intractable pain conditions such as complex regional pain syndrome (CRPS) [1] and requires insertion of an implantable pulse generator (IPG). The lower abdomen is an alternative site for the IPG placement. Tunneling is required for connection from the incision site at the back region, where the stimulation lead is inserted, to the lower abdominal site, where the IPG is located.

Pain in the flank area where subcutaneous tunneling is performed and in the abdominal area where the IPG is inserted can sometimes be severe. Even if the pain of the CRPS-affected site is successfully reduced by SCS, use of opioids may not be reduced due to severe pain at the operation site.

Erector spinae plane (ESP) block is a new novel ultrasound-guided block technique [2] and is mainly used for thoracic postoperative pain management [3,4]. Several cases have been reported regarding the efficacy of ESP block at lower thoracic levels for pain control after abdominal surgery [5,6]. We report our experience of successful control of postoperative pain due to abdominal IPG implantation and tunneling in the flank area after SCS using ESP at the lower thoracic level.

A 59-year-old male patient suffered from neuropathic pain including hyperalgesia and allodynia with skin color changes after a right wrist injury that occurred a year earlier. The patient was diagnosed as CRPS type 1 in accordance with the International Association for the Study of Pain diagnostic criteria [7] and was not responsive to conventional therapy; thus, we decided to insert the SCS lead at the cervical level.

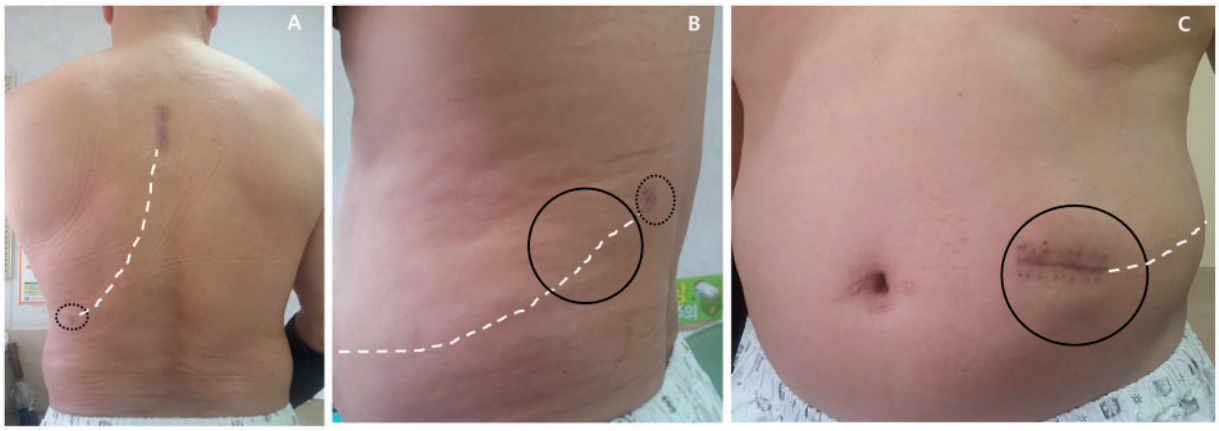

Figure 1 Photography of operation site. A) Back incision site for SCS lead insertion. B) Left flank incision site (dotted circle). C) IPG implantation site on the left abdomen. The white dotted line indicates the tunneling pathway, and the black circle indicates the main site of postoperative pain. IPG=implantable pulse generator; SCS=spinal cord simulation.

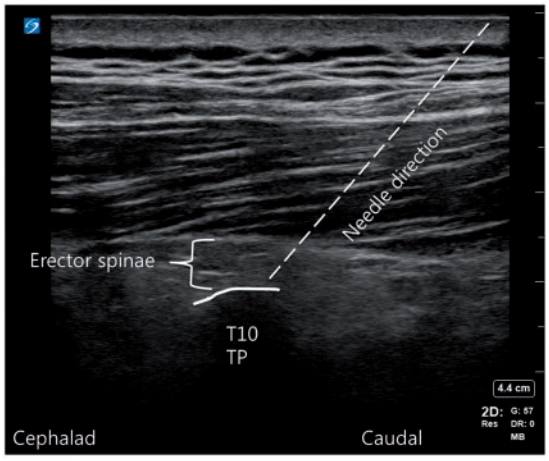

Figure 2 ESP block was performed at the T10 level. The dotted line indicates needle direction. The needle was inserted in a caudal to cephalad direction. ESP = erector spinae plane; TP = transverse process.

An epidural approach was performed at the interlaminar space between T1 and T2 levels, and the SCS lead was placed at the C5 to C7 levels. After a seven-day trial period, the SCS lead and IPG were permanently implanted. The pocket for IPG insertion was created in the subcutaneous layer in the lower abdomen approximately 8 cm left of the umbilicus. Due to the patient's large body size, the length of the tunneling device was insufficient to connect the SCS lead insertion site in the upper back with the IPG insertion site in the left abdomen. Therefore, an incision of approximately 1 cm was created in the left flank area, and the lead was connected to the abdominal IPG pocket via the left flank incision site (Figure 1).

After SCS implantation, right arm pain improved to 2/10 on the numerical rating scale (NRS). On the first day after surgery, the patient complained of pain in the tunneling pathway near the left flank incision site and in the left abdominal IPG pocket with intensity of 7–8/10 on the NRS (Figure 1). Doses of the previously used opioid were not reduced due to pain at the operation site.

We decided to perform ESP block at the lower thoracic level to control postoperative pain in the left flank and left abdominal areas. In a previous cadaver study, the injectate spread from the C7 to T8 vertebral level when the ESP block was performed at the T5 level [2]. Anatomically, the erector spinae muscle extends down to the lumbar level [8]. Based on the abovementioned facts, we expected that the local anesthetics would spread to the nerves that innervate the abdominal and flank areas when ESP block was performed at the T10 level.

The patient was placed in the right lateral decubitus position, and a high-frequency (12–15 MHz) linear probe (X-Porte, Sonosite, Bothell, MA, USA) was placed longitudinally on the left transverse process (TP) at the T10 level. After confirming the TP, a 22-gauge Tuohy needle was inserted to contact the TP using the in-plane technique (Figure 2). After bone-touching, hydrodissection with 1 mL of saline was used to confirm that the injectate spread between the TP and the erector spinae muscle; 20 mL of 0.4% lidocaine was then injected.

Ten minutes after the injection, the patient reported alleviation of left abdominal and flank pain to an intensity of 2/10 on the NRS. This pain relief lasted for 12 hours. The patient underwent ESP block at the same site every day for seven days, and no specific complications were observed during the procedures. Continuous ESP block was not performed due to the patient's refusal of catheterization. Before ESP block, the patient was given fast-

acting oxycodone (5 mg) as a rescue analgesic more than three times a day to control postoperative pain; however, while undergoing ESP blocks, oxycodone was discontinued. After seven days, the patient reported complete pain remission at the operation site, and he was discharged without pain at the operation site two weeks after the permanent SCS implantation.

Transversus abdominis plane (TAP) block or epidural or paravertebral block can be used to manage abdominal pain, but TAP block may be difficult to implement due to its proximity to the surgical site and concern regarding surgical site infection. Epidural or paravertebral block can be associated with hemodynamic changes [9]. In addition, injectate in the epidural space may interfere with the action of existing SCS leads.

ESP block at lower thoracic levels can be performed at some distance from the lead insertion site on the back and the IPG insertion site on the abdomen. Therefore, the risk of wound infection due to ESP block is relatively low. In addition, the neuraxial spread of local anesthetics during ESP block has not been observed to date; thus, the risk of hemodynamic changes may be less than with epidural or paravertebral blocks.

As SCS is usually performed for patients with intractable chronic pain who already take many analgesics, avoiding the use of additional analgesics to control postoperative pain is advisable and developing effective and safe postoperative pain control methods in these patients is important.

In conclusion, ESP block at a lower thoracic level appears to be a safe and effective method for postoperative pain control when performing SCS implantation. Further prospective studies are needed to determine the appropriate spine level and doses of local anesthetics for the routine use of ESP block.

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