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Superior Cluneal neuralgia—An underappreciated cause of low back pain?

With the multitude of common causes of low back pain including myofascial pain syndrome, facet arthropathy, sacroiliac pain, vertebrogenic pain, discogenic pain, nociplastic pain, spondylolisthesis and others, one possibly easily overlooked etiology is superior cluneal nerve entrapment and neuralgia. In addition to being overlooked, it is a diagnosis that may be met with skepticism by patients and providers alike because it is lesser known and there is no consensus on proper diagnostic and therapeutic options for this condition, We would like to highlight the increasingly growing evidence base for this diagnosis and hope that future studies will provide more insight for its inclusion in a list of differential diagnoses for low back pain. In this issue of Interventional Pain Medicine, two case reports show the need for more research on this topic [9,11].

Superior cluneal neuralgia is typically experienced as pain in the gluteal and mid-lateral low back that may radiate to the upper leg. It is thought to occur via entrapment, most commonly as the nerve traverses the thoracolumbar fascia in the vicinity of the posterior iliac crest [1]. Anatomic investigation of the superior cluneal revealed heterogeneity of its origin from the lateral dorsal ramus of either L1, L2 or L3 and suggested other potential areas of entrapment or injury, including the level of the erector spinae muscles [2]. Indeed, in the past it was also noted as a not uncommon complication of iliac crest bone graft harvest [3]. In epidemiologic studies of low back pain, superior cluneal nerve entrapment and neuralgia occurred in 1.6–14 % of subjects [5–7]. Kuniya et al. [4] dissected 50 cadaveric specimens and found an average size of the three nerves ranging from 0.45 mm to 3.36 mm.

Once the diagnosis is suspected, confirmation may be achieved with ultrasound or a fluoroscopic guided injection targeting the iliac crest [6–8]. Chang et al. [1] describe multiple techniques for ultrasound identification of the medial, intermediate and lateral branches as they course over the longissimus and iliocostalis near the spine, and then over the iliac crest and gluteus medius distally. If the patient has a positive response to a diagnostic block, follow up treatment can include repeat block with corticosteroids, radiofrequency ablation, cryoablation, pulsed radiofrequency neuromodulation, and peripheral nerve stimulation, and surgical decompression. One clear benefit of ultrasound is in identification of one or more of these nerves providing a clear target for more specific follow-up treatment.

Many patients with pain originating from a cluneal nerves will have enlargement of these nerves. The superior cluneal nerves are very small but can become edematous with increased diameter up to 3 mm and become visible on ultrasound when pathologic [4]. Sometimes this is easier to see as the nerve crosses the iliac crest generally in a valley in the bone then traced distally over gluteus muscles or proximally over iliocostalis. The non-edematous nerve may be very challenging to find with ultrasound alone.

This issue of Interventional Pain Medicine contains a case report titled, “Sustained pain relief from radiofrequency ablation of the superior cluneal nerves using a bipolar palisade technique: A case report [9].” Theodore Cohen describes a procedure under fluoroscopic guidance using four needles 1 cm apart with a target 7–8 cm lateral to L5 midline over the iliac crest and then performing bipolar radiofrequency ablation. With this technique, the patient had a greater than 80 % decrease of pain intensity at 6 months after the procedure. The palisade technique was previously described to treat sacroiliac joint pain by creating a contiguous lesion between each set of needles [10]. The superior cluneal nerves are similarly small nerves with a variable course running over the iliac crest in a 3–4 cm line. We suspect that without clearly identifying the nerves with ultrasound, larger ablation techniques like bipolar lesions and a palisade approach will yield better long-term results with the caveat that a larger lesion will tend to cause more post-procedural pain during the recovery phase.

Next, in this issue, Leonardo Arce Gálvez et al. published another case series, “Superior cluneal nerves radiofrequency in the management of chronic low back pain [11],” in which the team reports a new ultrasound-guided technique for radiofrequency ablation in which in four patients, three target areas around the posterior superior iliac spine (PSIS) were ablated. Although nerve stimulation was used to confirm paresthesia at 0.3–0.5v, the ultrasound modality was used to image a bony landmark rather than specifically finding the three nerve branches. It is possible that most of the lesions were applied on the medial superior cluneal nerve. The authors reported average 50–90 % decrease in pain intensity and functional improvement at 4- and 10-week follow-up periods.

In our experience, if a patient has positive, radiating Tinel’s sign at the PSIS and the cluneal nerve can be seen on ultrasound imaging, it is more likely the diagnostic blocks will be positive. If the cluneal nerve is not visualized with ultrasound and/or the response to the diagnostic blocks is less than 50 % pain intensity reduction, then one should generally explore other etiology of low back and gluteal pain. If short term pain relief and improvement of function with the diagnostic blocks is achieved, radiofrequency ablation should be considered. In cases of chronic, neuropathic pain, unresponsive to the other treatment approaches, peripheral nerve stimulation procedures may be considered, as well as surgical decompression.

Chronic low back pain is a common symptom, but the diagnosis leading to this symptom is not always apparent. In these cases, one should always consider entrapment neuropathy of superior cluneal nerves. However, despite the significant progress in understanding this condition there is still significant heterogeneity in its diagnosis and therapeutic approaches. We need well-designed prospective studies to better inform the appropriate algorithms for diagnosis of this condition and establish efficacy and safety of its treatment options.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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