Concurrent Notalgia Paresthetica and Brachioradial Pruritus Associated With Cervical Degenerative Disc Disease

Nili N. Alai, MD; Harry B. Skinner, MD, PhD

PRACTICE **POINTS**

- Assess the spine in patients with notalgia paresthetica (NP) and brachioradial pruritus (BRP). Cervical spinal disease, especially at the C5-C6 level, may be the root cause of BRP and/or NP.
- Consider a multimodality approach to treatment, including physical therapy, acupuncture, massage, and transcutaneous electronic nerve stimulation.
- Treat the neck (underlying cause) and expect the skin (cutaneous symptoms) to follow.

Notalgia paresthetica (NP) is a common, often refractory sensory neuropathic syndrome with the hallmark symptoms of localized pruritus and dysesthesia of the unilateral infrascapular region. Brachioradial pruritus (BRP) is similarly classified as a localized pruritus syndrome but of the upper extremities, typically one or both forearms. Notalgia paresthetica and BRP are both generally chronic, nonlethal, incurable conditions with intermittent remissions and exacerbation. Often described as dermatologic syndromes, both diseases are typically considered to be multifactorial in etiology with an uncertain etiology. However, recent literature suggests that it is highly probable that NP in many, if not nearly all cases, has an association with underlying cervical disease at the C5-C6 levels. This elucidation has resulted in a paradigm shift in evaluation and treatment of NP as cervical disease with referred skin manifestations to the mid back. Notalgia paresthetica and BRP may occur concurrently in the same patients. To determine possible underlying cervical spine disease, it is vital to examine the neck and consider radiographic studies of the spine. Collaborative multispecialty evaluation may be indicated in primary management of these two conditions. For cases of NP and BRP that are associated with cervical disease, the first-line therapy may include nondermatologic spinal treatments. Many cases of NP and BRP are most likely dermatologic signs of underlying degenerative spine, disc, and muscle disease.

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Case Report

A 74-year-old man presented with persistent episodes of severe pruritus with exacerbations on the bilateral forearms, arms, and left side of the mid back of 4 years' duration. He had a refractory and debilitating disease that had failed extensive therapies including topical antipruritics, antihistamines, oral hydroxyzine, capsaicin, potent topical steroids (ie, clobetasol, fluocinonide, triamcinolone), phototherapy with narrowband UVB, and various dietary modifications including a gluten-free trial. The patient reported he had exhausted all medical evaluation through care with more than 7 physicians and multiple dermatologists, including a university-based dermatology department for repeated consultations; he was seen by our dermatology center for an eighth opinion.

Initial dermatologic examination revealed multiple secondarily excoriated, hemorrhagic, hyperpigmented plaques and nodules on the right side of the mid upper back indicative of notalgia paresthetica (NP) with secondary chronic skin changes (Figure 1). Additional examination of the left arm and forearm revealed several open erosions, raised nodules, and lichenified skin plaques indicative of brachioradial pruritus (BP) with secondary skin changes (Figure 2). In addition, multiple lichenified plaques of the left side of the mid back were associated with decreased sensory alternations to light touch and pin prick. Of note, the localized pruritus pattern, particularly of the unilateral infrascapular back region, heralded the possibility of a neuropathic pruritus condition originating from the cervical spine. Examination confirmed decreased range of motion in the neck with associated marked palpable bilateral cervical muscle spasm and tenderness. Laboratory testing confirmed *Staphylococcus aureus* secondary skin infection that was treated empirically with chlorhexidine wash. General pruritus serology and imaging workup was ordered with contributory

Dr. Alai is from The Skin and Wellness Center, Laguna Hills, California. Dr. Skinner is from the Department of Orthopedic Surgery, St. Jude Heritage Medical Group, Fullerton, California.

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Correspondence: Nili N. Alai, MD, 26081 Merit Cir, Ste 109, Laguna Hills, CA 92653 (theskincenter@yahoo.com).

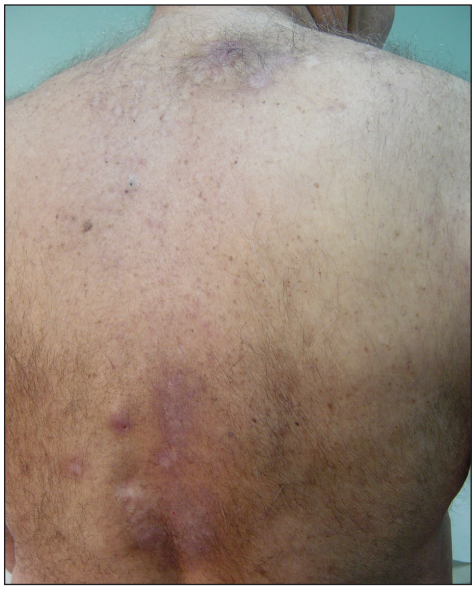

FIGURE 1. Notalgia paresthetica of the right side of the mid back (classic distribution) with atypical hyperpigmented presentation on the right side of the mid upper back.

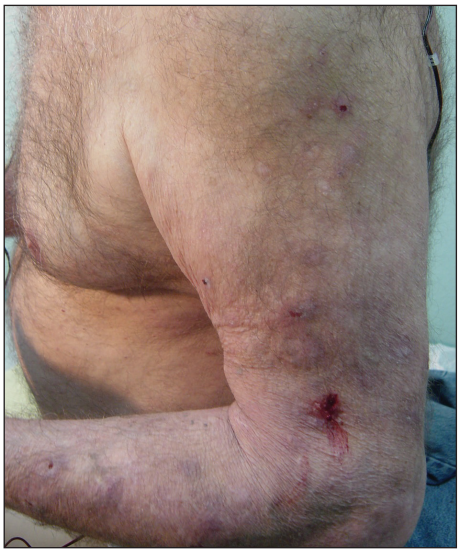

FIGURE 2. Brachioradial pruritus of the left arm with excoriations, lichenification, and prurigo nodules.

results. The patient's medical history was notable for noninsulin-dependent diabetes mellitus, obesity, deep venous thrombosis, asthma, vein surgery, cardiovascular disease, atrial fibrillation, atopy, allergies, asthma, and keratosis pilaris, as well as drug intolerances of warfarin sodium, sitagliptin, and clopidogrel. His medications on presentation included glyburide, digoxin, prednisone, aspirin, cetirizine, cimetidine, and hydroxyzine. Based on the relatively classic localized pruritus symptoms and the anatomical distribution of skin findings, a clinical diagnosis of concurrent NP and BRP was made, and radiologic studies of the cervical spine were ordered.

Magnetic resonance imaging (MRI) of the cervical spine showed severe central canal stenosis at C3-C4 secondary to disc disease slight asymmetric toward the right side, severe central canal stenosis at C4-C5 slightly more prominent in the midline, severe central stenosis at C5-C6 more prominent in the midline, and mild changes at other levels as described. Laboratory workup revealed an abnormal complete blood cell count with mildly elevated white blood cell count (11,800/μL [reference range, 4000–10,500/μL]), elevated neutrophils (8600/μL [reference range, 1800–7800/μL]), elevated eosinophils (600/μL [reference range, 0–450/μL]), and elevated IgE (160 IU/mL [reference range, 0–100 IU/mL]). Further testing revealed negative results for *Helicobacter pylori* IgG and IgM, human immunodeficiency virus, and hepatitis B and C screening panels; antinuclear antibody negative; normal thyroid-stimulating hormone; and normal thyroid peroxidase antibody. Chest radiograph and computed tomography of the chest, abdomen, and pelvis were negative.

We referred the patient for a neurosurgical consultation that uncovered newly diagnosed severe cervical stenosis with mild to moderate canal compromise at C3, C4, C5, and C6. His motor examination revealed full strength in the upper extremities (5/5). Sensory examination showed patchy sensory alteration on the mid back. He declined oral antibiotics as advised for the skin staphylococcal infection and neurosurgical treatment for the cervical disease.

During the 4 years prior to presentation at our center, the patient reported failure to improve with a dermatologically prescribed gluten-free diet as well as all topical and oral steroid treatments. He was presented at a university grand rounds where a suggestion for UVB light treatment was made; the patient reported possible worsening of symptoms with narrowband UVB phototherapy.

At the patient's first visit at our center, for immediate symptom relief he underwent therapy with transcutaneous electronic nerve stimulation (TENS) with acupuncture of the cervicothoracic spine (Figure 3). He agreed to discontinue oral prednisone and begin chlorhexidine cleansing body wash, low-dose hydroxyzine 10-mg tablets up to 60 mg every 6 hours as required for pruritus, and mupirocin intranasal ointment. At 1-week follow-up, he reported at least 50% improvement in his symptoms with decreased pruritus, improved sleep, and enhanced quality of life. Within 2 weeks of initial assessment, there was a notable 70% clinical improvement of both the NP and BRP, with a notable decrease in cutaneous erosions and flattening of the pruritic skin nodules. He reported adequate control of symptoms with continued TENS for at-home use 3 times daily for 5- to 10-minute intervals.

Comment

NP Presentation—Notalgia paresthetica is a common, albeit heavily unrecognized and underdiagnosed, sensory neuropathic syndrome of the back, classically of the unilateral infrascapular region. Notalgia paresthetica is

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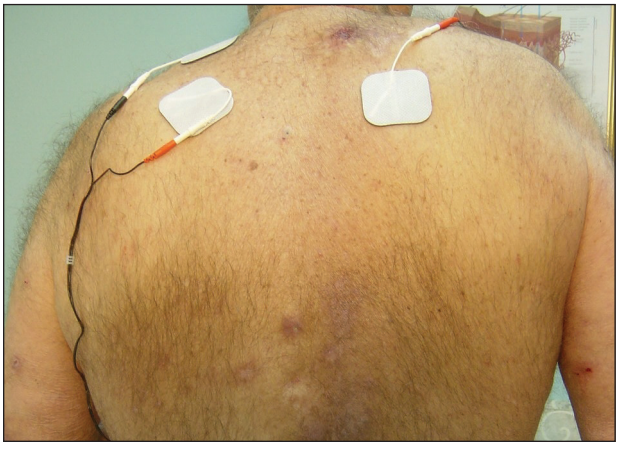

FIGURE 3. Transcutaneous electronic nerve stimulation treatment electrodes on the back.

largely associated with a particular localized dysesthesia that often is described by many patients as an under-the-skin itch. In 1934, NP was named and described as a periodic itching or pain on a small patch of skin located along the mid back.

The dermatologic condition may consist of other symptoms that include but are not limited to localized burning, pain, tenderness, hyperalgesia, or dysesthesia. Notalgia paresthetica typically is associated with a poorly confined tan or hyperpigmented patch in the symptomatic area, though the skin may have no visible findings in many early cases. Notalgia paresthetica tends to be a chronic condition with periodic remissions and exacerbations. It is generally not associated with other comorbidities and is not life threatening; however, it does frequently decrease quality of life, causing much discomfort and annoyance to the affected patients.

Treatment—Topical therapies for NP have generally failed and are considered difficult because of the out-of-reach affected location. There is no uniformly effective treatment of NP.

Pathogenesis—The etiologies for NP and BRP are evolving and remain to be fully elucidated. Although the exact etiology remains uncertain, there are several possible mechanisms that have been proposed for NP: (1) neuropathy from degenerative cervicothoracic disc disease or direct nerve impingement,[1] and (2) localized increased sensory innervations of the affected skin areas.[2]

Differential and Workup—The differential diagnosis in NP may include allergic or irritant contact dermatitis, fixed drug eruption, dermatophytosis, neoplasm, lichen amyloidosis, arthropod reaction, lichenified skin reactions including lichen simplex chronicus, neurodermatitis, infection, and other hypersensitivity reaction.

It is important during the initial assessment of patients with NP and/or BRP to obtain a thorough history of osteoarthritis, neck trauma, motor vehicle accident(s), vertebral fracture, cervical neoplasm or malignancy, family history of NP or BRP, or cervical disc disease. Radiographs or MRIs of the cervical spine may aid in diagnosis and treatment, and perhaps more so if there is an absence of contributory medical history. Radiographic imaging also may be indicated if there is a positive family history of osteoarthritis or vertebral disc disease.

A full laboratory workup including complete blood cell count, chemistry panel including renal and liver functions, and other laboratory tests (eg, IgE levels) may be warranted if pruritus is generalized and persistent to exclude other causes. Proper management of NP and BRP may involve a multispecialty effort of dermatology with radiology; orthopedic surgery; neurosurgery; neurology; and adjunctive fields including acupuncture, massage, chiropractic, and physical therapy.

NP and BRB Overlap—Because NP and BRP often originate from varying degrees of cervical disease, particularly at the C5-C6 level, traditional topical therapies aimed at treating the affected skin of the mid back and forearms may be ineffectual or partially effective as basic emollients. Due to NP and BRP's periodic spontaneous remissions and exacerbations, it may be reasonably difficult to accurately measure direct response to various therapies. Some topical therapies aimed at the mid back skin or forearms may appear partially effective from a placebo-type perspective.

Currently, uniformly effective treatment of NP and BRP include the following: (1) therapies aimed at the cervical spine at C5-C6, including TENS, cervical massage, physical therapy, and acupuncture; and (2) therapies targeting the underlying lowered pruritus threshold such as oral antihistamines and narrowband UVB. Although uniformly effective treatments in this space had been previously lacking, traditional therapeutic options for NP and BRP included capsaicin cream, eutectic mixture of local anesthetic cream, topical steroids, pramoxine cream, topical cooling, oral steroids, menthol creams, various commercially available topical mixtures of menthol and methyl salicylate, cordran tape, intralesional corticosteroid injections, botulinum toxin injections,[3] oral antihistamines, hydroxyzine, doxepin, topiramate, carbamazepine, antidepressants, gabapentin, oxcarbazepine, topiramate, thalidomide,[4] paravertebral local anesthetic block, cervical epidural injection, surgical resection of the rib, and many others. Some of the tried systemic therapies exert their effect through the spinal nerves and central nervous system, thereby supporting the neuropathic etiology of NP.

Cervical Disc Disease—Alai et al[1] reported a 37-year-old with documented NP on the right side of the back with MRI findings of disc disease at C5-C6 and mild nerve impingement that strongly suggest the association of cervical degenerative disc disease and NP.

Savk and Savk[5] reported that 7 of 10 patients with NP demonstrated normal neurological examination and standard electrodiagnostic results. All had skin histopathology compatible with postinflammatory hyperpigmentation.

There were no amyloid deposits or other described pathology on pathologic examination of the skin. Seven of 10 cases confirmed radiographic changes in the vertebra corresponding to the dermatome of the cutaneous lesion.[5]

An earlier study by Springall et al[6] evaluating the mechanism of NP studied whether the cutaneous symptoms were caused by alternations on the cutaneous innervation of the involved infrascapular area. They postulated that the histology findings would show increased dermal innervation to the areas; however, no measurable change in the distribution of neuropeptide-immunoreactive axons was found. There was an increase in the number of intradermal protein gene product 9.5 immunoreactive nerve fibers and epidermal dendritic cells compared with unaffected areas from the same patients and normal controls. It was concluded that the symptoms of NP may be partially related to an increase in the sensory epidermal innervation in the affected skin areas.[6]

Histologic studies have shown cutaneous changes in a few cases including lichen amyloidosis that may be secondary to the localized chronic scratching and rubbing.[7] Clinical observations in orthopedics have established a clear relationship between the upper thoracic and interscapular region and the lower cervical spine. Frequently, cervical disc disease presents as referred pain in the upper thoracic and interscapular area. Similarly, some tumors of the cervical medulla also have presented as interscapular pain.[8]

Some have speculated direct involvement and actual entrapment of the posterior rami of T2-T6 spinal nerves.[9] However, there are referred symptoms from the cervical area directly to the interscapular back. Degenerative vertebral and disc changes corresponding to the affected dermatome may be observed in some cases. Radiographic imaging of cervical and thoracic spine will help to exclude disc disease and possible nerve compromise.[8]

With advances in radiography and availability of MRI, earlier detection and intervention of cervical disc disease is possible. Early recognition may promote timely intervention and treatment to prevent cervical spine disease progression. In addition to degenerative cervical discs, osteoarthritis, and cervical spine strain and muscle spasm, there may be neoplasms or other pathology of the cervical spine contributing to NP and BRP.

There is some thought that there may be a relationship between NP and BRP. The described association of many cases of BRP and cervical spine disease[6] and description of these diseases as likely neuropathic/neurogenic pruritic conditions also support a probable association of these two conditions. In contrast, NP has classically been described as unilateral in distribution, while BRP may involve unilateral or bilateral dorsolateral forearms. Most recently, as seen in our case, there are increasing incidences of nonclassic presentations of both of these diseases that may involve additional skin areas and be a basis for diagnostic challenges to the clinician.

First-line therapies for NP and BRP with associated cervical spinal disease are currently evolving and may include nondermatologic and noninvasive treatments such as spinal manipulation, physical therapy, acupuncture, cervical soft collars, massage, cervical traction, cervical muscle strengthening and increased range on motion, oral nonsteroidal anti-inflammatory medications (eg, ibuprofen, celecoxib, ketorolac), and oral muscle relaxants (eg, carisoprodol, cyclobenzaprine, methocarbamol, metaxalone). Current standard therapies such as cervical vertebral fusion and disc replacement as well as other innovative treatment measures for degenerative disc disease that may be introduced in the future also can be considered.[10]

Conclusion

Notalgia paresthetica and BRP may not be solely skin diseases but rather cutaneous signs of an underlying cervical spine disease. The striking association of NP with BRP we present as well as the degenerative and/or traumatic cervicothoracic spine disease suggests that early spinal nerve impingement or cervical muscle spasm may contribute to the pathogenesis of these skin symptoms. Additional studies are needed to further assess the relationship of NP and BRP as well as the association of each disease entity independently with cervical spine disease, as it is unknown if these are causal or coincidental findings. Although topical therapies may seemingly help decrease the localized symptoms in NP and BRP in some cases, systemic or broader-scope cervical spinal evaluation may be warranted to fully evaluate refractory cases. Cervical spinal imaging and treatment, particularly at C5-C6 levels, may be appropriate as primary or first-line therapy in many cases of NP and BRP. The paradigm shift in thinking will more likely than not be to treat the cervical spine and the skin will follow.

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