Brachioradial pruritus as a result of cervical spine pathology: The results of a magnetic resonance tomography study

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Background: Brachioradial pruritus (BRP) describes a rare form of itching occurring at the dorsolateral part of the forearms. Recent case reports suggest that BRP may be attributed to cervical lesions or spine neoplasms.

Objective: We sought to determine the incidence of cervical spine changes in BRP and to correlate the localization of spinal lesions with the dermatomal presence of pruritus.

Methods: Magnetic resonance tomography (MRT) of the cervical spinal cord, a chest x-ray, and a skin biopsy were performed in 41 patients (28 female, 13 male; 59.0 ± 10.6 years) with BRP. Patients completed an itch questionnaire (NeuroDerm Questionnaire) that included a dermatome chart and the Northwick Park Neck Pain Questionnaire.

Results: The patients marked the locations C5 (90.2%) and C6 (100%) on the dermatome chart. All patients had detectable MRT changes. In 80.5% of the patients, stenosis of the intervertebral foramen or protrusions of the cervical disk led to nerve compression. The location of the nerve compression lesions correlated significantly with the dermatomal localization of the pruritus (Spearman correlation coefficient 0.893; $P < .01$). No spinal neoplasm was observed, and 19.5% of the patients had degenerative changes without significant correlation to the dermatomal localization of pruritus.

Limitation: No healthy control group without pruritus was investigated.

Conclusion: BRP may result from cervical nerve compression, and rarely, it may also stem from degenerative changes. Our findings suggest that even slight cervical changes detected on MRT may alter itch afferents and lead to BRP. Spinal cord tumors are rare and should be ruled out by a cervical spine MRT. (J Am Acad Dermatol 2011;65:756-62.)

Key words: cervical stenosis; dermatome; itch; magnetic resonance tomography; nerve root impingement; neuroforamen; neuropathic pruritus; peripheral nerve; sensory nerves; solar pruritus.

Brachioradial pruritus (BRP) is a rare form of chronic localized itching at the dorsolateral part of the forearms.[1-3] For nearly 30 years, BRP was considered to be related to ultraviolet (UV) irradiation because UV exposure worsens the symptom.[2,4-14] As early as 1983, Heyl[3] proposed that BRP may be caused by nerve injury in the cervical spine or

Abbreviations used:

BRP:	brachioradial pruritus
DCs:	degenerative changes
MRT:	magnetic resonance tomography
NC:	nerve compression
UV:	ultraviolet

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by nerve compression (NC). Several recent studies have suggested that BRP may result from cervical spine lesions such as radiculopathy, disk herniation, osteophytes, or spinal neoplasms.[15-29] For example, Kavak and Dosoglu[20] and Fleuret et al[27] described an ependymoma located in the cervical spine that led to BRP. In a retrospective study, Goodkin et al[15] found radiographic evidence of pathological changes in the cervical spine in 50% of patients with BRP. A prospective study that describes in detail the spinal cord pathology in BRP and clinically correlates cervical spine lesions with the dermatomal localization of the pruritus is pending. The current study aimed to investigate: (1) spinal cord pathology by magnetic resonance tomography (MRT); (2) the frequency of spinal neoplasms; and (3) the clinical relevance of spinal cord pathologies in a representative cohort of patients with BRP.

CAPSULE SUMMARY

- Brachioradial pruritus (BRP) is a rare form of chronic localized itching.
- Controversy exists regarding the origin of BRP.
- Our magnet resonance tomography study suggests that spinal cord lesions are a major factor in pathogenesis of BRP.
- Radiologic investigation should be performed in patients with BRP.

METHODS

In all, 41 patients (28 female, 13 male; 27-77 years; mean 59.0 years, SD 10.6; median 63 years) with pruritus localized to the dorsolateral aspect of the arms were examined. All patients completed a local itch questionnaire (NeuroDerm Questionnaire[30]) that included a dermatome chart for the exact localization of the symptom; 35 patients also completed the Northwick Park Neck Pain Questionnaire.[31] Patients underwent routine clinical investigation, a skin biopsy of the affected area (n = 36), a chest x-ray, and MRT of the cervical spine (T1-weighted sagittal images, T2-weighted sagittal images, and T1-weighted axial images, Fig 1). Skin biopsy specimens were routinely stained with hematoxylin-eosin and immunostained against neurofilaments (anti-neurofilament antibody, clone 2F11, 1:50, Dako, Hamburg, Germany) and CD56 (anti-CD56 antibody,[32] 1:50, Menarini, Berlin, Germany).

Data were collected and entered using Microsoft Excel for Windows XP Professional (Microsoft Corporation, Redmond, WA). Statistical analysis was done using SPSS for Microsoft Windows (SPSS Inc, Chicago, IL; German version 17.0). To detect differences between diagnostic groups based on MRT findings and establish correlations with the dermatomal localization of pruritus and presence of neck pain, Spearman correlation coefficients were generated and P less than or equal to .05 was considered statistically significant. Patients provided informed consent before performing investigations. This study was approved by the local ethics committee.

RESULTS

Results of questionnaires

Of the 41 patients, 39 (95.1%) reported itching, burning, stinging, or a combination of these, whereas two patients (4.9%) described pure itching. A total of 28 patients (68.3%) reported reduced quality of life (Table I). Pruritus duration ranged from 0.5 to 30 years (mean 6.7 years; SD 7.4 years; median 3 years). Mean pruritus intensity, scored on the visual analog scale, ranged from 1 to 10 and was, on average, 7.7 ± 2.0 (median 8). Five patients (12.2%) reported seasonal variations and pruritus that was aggravated in the summer. In all, 27 patients (65.9%) did not experience aggravation in summer; 9 patients (21.9%) experienced pruritus during the whole year and could not comment on aggravation during summer because they avoided UV exposure. Fourteen patients (34.1%) had a history of cervical spine disorders. A total of 35 patients (85.4%) completed the Northwick Park Neck Pain Questionnaire; 21 patients (60%) reported current neck pain causing a minor to moderate disturbance (Table II). On the dermatome chart, patients marked pruritic areas between C3 and Th1. The most frequently affected dermatomes were C5 (n = 37, 90.2%; dorsolateral aspect of the upper arm) and C6 (n = 41, 100%; dorsolateral aspect of the forearm). Pruritus started in 29 patients (70.7%) on the forearm over the brachioradial muscle (C6 dermatome) on either one side (n = 16, 55.2%; right, n = 11; left, n = 5) or both sides (n = 13, 44.8%) (Table I). In 5 of these patients (17.2%), pruritus was confined to this area. In 14 patients (48.3%), pruritus spread to a neighboring dermatome (C5, n = 10; Th1, n = 4). For example, in 10 patients, BRP started over the brachioradial muscle (C6) and spread to the upper arm (C5). In 10 patients (34.5%), pruritus spread to two (n = 5) or 3 (n = 5) neighboring dermatomes (C3, n = 5; C4, n = 9; C5, n = 10).

Seven patients reported the initial appearance of pruritus simultaneously in C6 and additional dermatomes. Five other patients reported it solely in other dermatomes than C6. In total, pruritus occurred in these 12 patients (29.3%) as follows: C3 (n = 2; neck),