Dynamic Chiropractic

DIAGNOSIS & DIAGNOSTIC EQUIP

Posttraumatic Sympathicotonia and Raynaud's of the Hands Secondary to Thoracic Outlet Syndrome: The "Blue Hands" Syndrome

There are times in clinical practice when a patient will complain of extreme coldness of the hands that appear blue and cyanotic with hyperhydrosis. This will often be seen posttraumatically when an injury has occurred to the cervical spine, but can be seen in patients with no apparent history of recent trauma.

The presentation of vasomotor disturbance with sudomotor instability should alert the clinician to the differential diagnosis of carpal tunnel syndrome, vascular disease, neuropathy, Raynaud's phenomenon, reflex sympathetic dystrophy syndrome (RSDS) and costoclavicular thoracic outlet syndrome.

Costoclavicular compression at the thoracic outlet can occur to the neurovascular bundle from a cervical rub enlarged transverse process, fibrous bands, and myofascial dysfunction. The patient will exhibit both neurogenic and vascular symptoms. If the costoclavicular test is performed on the patient, it will worsen the patient's symptoms making the hand colder, bluer, and numb. Clinically this finding approximates that of Raynaud's phenomenon with the hands being blue and cold.

Diagnostic testing for thoracic outlet syndrome typically has included that of EMG, NCV, and SEP studies which often do not document the pathology. Vascular testing including angiography is very invasive and only shows pathology in the more severe cases. Doppler plethysmography has been used and it too tends to show only the more severe cases. Thermography (IRT) has been shown by numerous investigators to be useful sensitive tool for thoracic outlet syndrome.

Parot documented the utility of IRT in thoracic outlet syndrome. The thermographic findings were typically seen in the hands and the C8 neural field of the upper extremity. The hands will not only display a disruption of the longitudinal thermal gradient -- normal temperature distribution from proximal to distal -- (Fig. 1), there will also be a disruption of the medial and lateral thermal gradient of the hands (Fig. 2).

Temperature asymmetries (hypothermia) will generally be seen from 3-4 degrees centigrade (Fig. 3). The forearm findings will typically display hyperthermia at C7 or C8 neural fields and thermatomes/cutonomes. Since the patient displays autonomic symptoms of vasomotor and sudomotor instability, IRT is well-suited to document this sympathetic dysfunction.

When compression or injury at the costoclavicular region of the thoracic outlet occurs, there will be irritation of sympathetic fibers in the lower region of the brachial plexus, as well as vascular compression. It is probably a combination of the sympathetic irritation and vascular compression that causes the patient to have cold, sweaty, blue hands. Careful monitoring and aggressive treatment is important due to the possibility of trophic changes from vascular compromise and the possibility of the development of reflex sympathetic dystrophy which is a severely disabling condition. IRT is not only helpful in confirming the diagnosis, but is also very useful since one can monitor the condition by repeat scanning since IRT is non-invasive, pain free, and cost effective.

Conclusion

Infrared thermography is a most useful clinical diagnostic tool for sustained sympathicotonia of the hands due to costoclavicular thoracic outlet syndrome. When the patient presents with blue, cyanotic hands with vasomotor and sudomotor disturbance, thermography will provide the clinician with invaluable information. Thermography is useful as a diagnostic and treatment management tool.

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David J. BenEliyahu, D.C., DNBCT, CCSP
Selden, New York

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