

## **Thermatomal changes in cervical disc herniations.**

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Subjective symptoms of a cool or warm sensation in the arm could be shown objectively by using of thermography with the detection of thermal change in the case of radiculopathy, including cervical disc herniation (CDH). However, the precise location of each thermal change at CDH has not been established in humans. This study used digital infrared thermographic imaging (DITI) for 50 controls and 115 CDH patients, analyzed the data statistically with t-test, and defined the areas of thermatomal change in CDH C3/4, C4/5, C5/6, C6/7 and C7/T1. The temperature of the upper trunk and upper extremities of the control group ranged from 29.8 degrees C to 32.8 degrees C. The minimal abnormal thermal difference in the right and left upper extremities ranged from 0.1 degree C to 0.3 degree C in 99% confidence interval. If delta T was more than 0.1 degree C, the anterior middle shoulder sector was considered abnormal ( $p < 0.01$ ). If delta T was more than 0.3 degree C, the medial upper aspect of the forearm and dorsal aspect of the arm, some areas of the palm and anterior part of the fourth finger, and their opposite side sectors and all dorsal aspects of fingers were considered abnormal ( $p < 0.01$ ). Other areas except those mentioned above were considered abnormal if delta T was more than 0.2 degree C ( $p < 0.01$ ). In  $p < 0.05$ , thermal change in CDH C3/4 included the posterior upper back and shoulder and the anterior shoulder. Thermal change in CDH C4/5 included the middle and lateral aspect of the triceps muscle, proximal radial region, the posterior medial aspect of the forearm and distal lateral forearm. Thermal change in CDH C5/6 included the anterior aspects of the thenar, thumb and second finger and the anterior aspects of the radial region and posterior aspects of the pararadial region. Thermal change in CDH C6/7 included the posterior aspect of the ulnar and palmar region and the anterior aspects of the ulnar region and some fingers. Thermal change in CDH C7/T1 included the scapula and posterior medial aspect of the arm and the anterior medial aspect of the arm. The areas of thermal change in each CDH included wider sensory dermatome and sympathetic dermatome. There was a statistically significant change of temperature in the areas of thermal change in all CDH patients. In conclusion, the areas of thermal change in CDH can be helpful in diagnosing the level of disc protrusion and in detecting the symptomatic level in multiple CDH patients.