Perception and sensation essay sample

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Introduction

Abrasion of peripheral nerves remains to be one of the serious conditions and is also one of the most challenging surgical reconstructive problems. Even with continous research and increased scientific knowledge there is still no surgical technique which can ensure recovery of tactile discrimination in the hand of an adult after a median nerve lesion Lundborg, G. & Rosen, B. (2004). The complications are extreme especially in the upper extremity and hand. Our skin is an important touch, pain, and pressure receptor. Touch receptors present in our skin is known as a Meissner's Corpuscle.

Touch receptor density is not uniform across human's body surface (or other animals, for that matter). Receptor density is highly expressed in areas where fine discrimination is most important i. e places like our lips and our fingertips. Similarly, receptor density is poorly expressed in areas where fine discrimination is pretty unimportant i. e. for instance, across our back.

The above described non- uniform distribution of touch sensors can be easily confirmed with the two-point threshold test. This test is conducted with the help of a pair of dividers (like those used in mechanical drawing). You can determine (in a blindfolded subject) the minimum separation of the points that produces two separate touch sensations. You will observe that the ability to discriminate the two points is far better on the fingertips or your hand in whole than compared to the back.

The density of touch receptors is also reflected in the amount of somatosensory cortex in the brain assigned to that region of the body. Somatosensory cortex is the area of our brain which senses stimuli to the

body surface. It is a stripe of brain that runs vertically, roughly around our ears. Various researchers have studied the allocation of somatosensory cortex area to the hand. It has been shown that if a particular finger is used heavily, its brain area increases; if it is underused, the brain area decreases. Some amazing recent work has looked at the brains of violin players and people who read Braille, to determine what kinds of changes have taken place with intense finger activity.

This has led us to believe that it is possible to regenerate sensory receptors in areas where lesions have affected. Physical therapists and lab bench researchers continue to study this in further depth to get a better understanding of peripheral and central nervous system and how they co-ordinate with each other. There have been numerous studies of similar type in past.

Finnel et. Al., 2004 reported that a calibrated paper clip is a reliable measure for two- point discrimination. They reported that there was no statistically significant difference between instruments used which was paper clip set and Disk- Criminator in their case. Using a clinically relevant threshold of 2 mm they showed that a properly calibrated paper clip can perform as well as a Disk- Criminator. Thus, we decided to use a paper clip bent to “ U” shape in our experiment.

Restoration of motor and sensory functions in the hand after nerve repair is a complex process governed by multilevel cellular, chemical and functional changes which is from the fingertips to the cortex of the brain (Lundborg

2004). This nerve function impair shows higher success rate in hands than in back.