Impaired Balancing Function in Patients of Chronic Mechanical Ankle Instability

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Category: Ankle

Keywords: balance, functional ankle instability, mechanical ankle instability

Introduction/Purpose: Chronic ankle instability (CAI) is a disease entity commonly seen after ankle ligament injury. It is divided into mechanical ankle instability (MAI) and functional ankle instability (FAI), with different pathological conditions. The purpose of this study was to test the balancing ability of MAI and FAI patients.

Methods: 30 CAI patients and 10 normal subjects were included according to the injury history, clinical symptom and MRI presentation. Stress tests were given under fluoroscopy to find out those with mechanical instability in CAI patients. Among them there were 18 MAI and 12 FAI patients. All patients were tested on a customized balancing ability assessment system developed by Shanghai Jiaotong University. Subjects were asked to stand on the platform for 30 seconds for both feet, 10 seconds for single foot, with eyes open. And 30 seconds for both feet, 5 seconds for single foot, with eyes closed. Each condition was tested for 3 trials and results were averaged. Parameters of balance like the swaying trajectory length and speed at both medial-lateral and anterior-posterior directions, the trajectory length per unit were obtained. Results were compared among three groups.

Results: The MAI group presented significantly greater imbalance in both medial-lateral and anterior-posterior directions compared with that in the control group while standing on the single diseased foot, with eyes open or closed. While in the FAI group, no significant difference was found in postural sway compared with that in the control group. The MAI group presented significantly greater imbalance in both medial-lateral and anterior-posterior directions than the FAI group while standing on the single diseased foot with eyes open or closed. No significant difference in balancing was found of the contralateral ankle in the two groups.

Conclusion: The balancing ability of MAI patients was impaired and then make them vulnerable to falling. Thus either balance training program or reconstructive surgery is needed to restore the balancing ability in those patients.

Foot & Ankle Orthopaedics, 2(3)
DOI: 10.1177/2473011417S000405
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