

## **Dural Related Restrictions in the Cranium, Cervical Spine and Pelvis in Concussed Athletes in the First Month.**

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**INTRODUCTION:** There are relatively few treatment options in the sports medicine field to manage sports related concussions other than waiting for resolution of symptoms and deciding upon safe return to sport (Aubry et al. 2002, Johnston 1998a, Cantu 1997). The greatest commonality of restrictions found within the sport concussion group in previous osteopathic research related to dural attachments and membranes (Leslie 2000, Gregory 2006). **OBJECTIVE:** To compare the resolution of neuropsychological deficits as measured by ImPACT software, dural related restrictions in the cranium, cervical spine and pelvis, and physician directed return to play in symptomatic concussed athletes compared to a control group of non-concussed athletes in the first month. **METHOD:** Experimental group A consisted of 11 athletes between the ages of 18-40 that had been diagnosed by a physician with a sport concussion. The assessments and testing were conducted (+/- 2 days) on Day 3, Day 14 and Day 28 following the concussion. The control group consisted of 5 healthy athletes between the ages of 18-40 with no history of diagnosed concussion. Experimental group B consisted of 5 athletes that had previously suffered concussions but had not recently (in the past month) sustained one. Health history forms and neuropsychological data were collected from the 21 participants using the ImPACT computer program (Immediate Post-Concussion Assessment and Cognitive Testing). Objective testing was done of 15 dural related areas. The clinical researcher completing the assessment was blinded to which group the athlete was in. **RESULTS:** There were a greater number and severity of dural related restrictions found in the concussed group of athletes compared to the control group. Several dural related restrictions were found in high proportion in the experimental concussion group A during the initial assessment including Sphenobasilar symphysis (100%), Sphenoid/ Vomer (100%), Ethmoid/Vomer (100%), and Tentorium Cerebelli (100%). In addition, several other areas had higher than control percentages including Falx Cerebri (82%), L5/S1 (73%), C0-C1 (73%), Sphenoid/Ethmoid (55%). During the first month, natural healing did occur in several of the regions assessed, including: Sphenobasilar symphysis (45% with experimental vs. 40% with control), Sphenoid/Vomer (27% vs. 40%), C0/C1/C2 (9-18% vs. 20-40%), L5/S1 (36% vs. 60%). At the end of the month when the athlete's had been cleared by a physician to return to play there were still significant restrictions in the experimental group compared to the control. These restrictions were not able

to naturally resolve and included: Sphenoid/Ethmoid (27% vs. 0%), Ethmoid/Vomer (73% vs. 40%), Falx Cerebri (36% vs. 0%), Tentorium Cerebelli (55% vs. 20%). **CONCLUSION:** This research hopes to continue the conversation into the possibility that osteopathic and craniosacral treatments would be beneficial to patients to help improve their long term outcomes.