Background: A 17-year-old Caucasian female interscholastic basketball player presented with a severe migraine and a sensation of increased pressure in her head. She stated that the symptoms began approximately three weeks prior and had continued to worsen. She rated her pain as ranging from 5/10 to 8/10 and compared the pressure sensation to changes perceived when in an airplane or underwater in a pool. The patient also stated that she had not been sleeping well and had a constant headache that was exacerbated with exercise. The headache and pressure were also provoked by trunk flexion. Additional symptoms included photophobia, blurred vision and diplopia. She stated that she was not experiencing any neurological symptoms and reported no history of prior head or cervical injury. She began taking Excedrin® (acetaminophen, aspirin, and caffeine) to manage the migraines and headaches, however there was no other therapeutic intervention. She also stated that she went to her family physician one week after symptom onset and was referred to a chiropractor. She stated that she did not report to the athletic trainer initially due to fear of being held out of participation.

Differential Diagnosis: Cerebral aneurysm, encephalitis, muscle tension headache, Tolosa-Hunt syndrome, cervical strain, cervical fracture, occipital headaches. Treatment: The patient was referred to a chiropractor as instructed by the physician. Following radiographs, the chiropractor diagnosed her as having an atlantoaxial subluxation (AAS) and performed a reduction using the Atlas Orthogonal procedure. Following reduction, the patient reported back to the athletic trainer and received myofascial release and massage for the upper trapezius and cervical erector group. In the days following initial reduction, the patient presented with occasional headaches during exercise but not to the severity of her original complaint. The patient received two more Atlas Orthogonal treatments form the chiropractor over the next two weeks and continued to receive soft tissue treatment by the athletic trainer. She was able to fully participate in all basketball activities. Uniqueness: This case is unique in that there was no known mechanism or predisposing factors. AAS subluxations are normally due to traumatic instances such as falls or blows to the neck or head. When non-traumatic subluxations occur, they are usually associated with cervical or pharyngeal inflammatory conditions or otolaryngologic procedures, which our patient did not have. Additionally, our patient failed to report cervical pain which is commonly associated with this injury. She also did not have any of the typical clinical signs which include palpable deviation of the C2 spinous process, spasm of the ipsilateral sternocleidomastoid and inability to rotate the head beyond midline in the contralateral direction. The migraines and vision disturbances she suffered were the result of atlas rotation and resultant compression of the vertebral artery and decreased cerebral perfusion. The Atlas Orthogonal procedure itself is also unique, as it is not viewed as a typical management procedure. Conclusions: Non-traumatic AAS is a rare but dangerous condition and only minimal evidence exists to support etiology and treatment. While this injury often goes unrecognized, it can have severe consequences. While headache alone is a non-specific symptom, cervical assessment should be included with this complaint. Common conservative management strategies include therapeutic modalities such as superficial heat, electrical stimulation and ultrasound, joint mobilizations and massage. Surgical management is sometimes necessary. Relevant Evidence: A systematic review including 96 patients with AAS with no history of previous trauma revealed that 48% had a recent history of infection mostly affecting the upper airways and 40% were in the postoperative period after head and neck procedures. Word Count: 581