**Introduction**

The optic nerve sheath diameter (ONSD) measurement includes the dural sheath, subarachnoid space and optic nerve (1). Increased ONSD has long been associated with increased intracranial pressure. Increased intracranial pressure is often associated with trauma (1). Some of the clinical symptoms in increased ICP include headache, vomiting, and drowsiness (1). These findings are often non-specific, and there have been attempts to find alternative methods of diagnosing increased ICP including measuring ONSD (1). To our knowledge, there have been no studies examining the specificity of increased ONSD. More specifically, there have not been studies examining the relationship between ONSD and primary intracranial tumors to our knowledge. We are examining the relationship between ONSD with T2 MRI imaging and Glioblastoma Multiforme.

**Methods**

After Institutional Review Board (IRB) approved the study, images from 24 patients with GBM were retrospectively examined by two independently trained observers. A 1.5 T Siemens magnetom Avanto was used to obtain all MR images. Axial T2 imaging was associated with increased intracranial pressure. The measurement of the ONSD was 6.31 +/- 0.50 mm in patients with increased intracranial pressure and 5.08 +/- 0.52 mm in healthy volunteers. Although increased ONSD has long been associated with increased intracranial pressure, there have been no studies to our knowledge examining the specificity of increased ONSD. Our retrospective analysis found a measurement of 6.8 +/- 0.6 mm for the ONSD on the right and 6.5 +/- 0.7 mm for the ONSD on the left. We discovered that the ONSD has a direct relationship with GBM tumor size which is statistically significant. In addition, there is no significant difference in measurements obtained between two independently trained observer, which signifies that the ONSD is a measurement that can be utilized in practice.

**Discussion**

One previous study found an increased ONSD on MR imaging was associated with increased intracranial pressure in patients with traumatic brain injuries. The measurement of the ONSD was 6.31 +/- 0.50 mm in patients with increased intracranial pressure and 5.08 +/- 0.52 mm in healthy volunteers. Although increased ONSD has long been associated with increased intracranial pressure, there have been no studies to our knowledge examining the specificity of increased ONSD. Our retrospective analysis found a measurement of 6.8 +/- 0.6 mm for the ONSD on the right and 6.5 +/- 0.7 mm for the ONSD on the left. We discovered that the ONSD has a direct relationship with GBM tumor size which is statistically significant. In addition, there is no significant difference in measurements obtained between two independently trained observer, which signifies that the ONSD is a measurement that can be utilized in practice.

**Conclusion**

Although the sample size was small and a larger patient population is needed, these results suggest the ONSD size is strongly associated with tumor size. Our results suggest that ONSD size could be a promising indicator of GBM tumor growth and/or regression after treatment. We are currently examining the relationship between ONSD and treated GBM tumors with gamma knife radiosurgery.

**References**