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Researchers identify common characteristics of rare pediatric brain tumors

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Vestibular schwannomas, more commonly known as acoustic neuromas, are benign brain tumors that develop on the balance (vestibular) and hearing or auditory nerves leading from the inner ear to the brain. These tumors are rare in children, and as a result, there is little consensus on common symptoms, tumor size, treatment, outcomes and recurrence rates for acoustic neuroma in pediatric patients.

In a new study, "Pediatric vestibular schwannomas: case series and a systematic review with meta-analysis," appearing in the *Journal of Neurosurgery*, researchers at Loyola University Medical Center and Loyola University Chicago Stritch School of Medicine performed a retrospective review of the diagnosis, treatment and outcomes of 15 patients (21 years of age or younger) with unilateral vestibular schwannomas, without neurofibromatosis type 2 (a genetic disorder that causes noncancerous tumor growth in the nervous system), who underwent surgery at Loyola University Medical Center between 1997 and 2019. The study authors also reviewed existing literature on this type of tumor in pediatric patients.

Overall, the review found that pediatric patients had similar symptoms to those of adult patients with acoustic neuromas; however, the tumor size was typically larger in the pediatric patients at the time of diagnosis, and symptoms of mass effect (secondary effects caused by the tumor) were more common. While some children with small tumors can be successfully treated with surgery only, residual tumors in pediatric patients were found to have a higher rate of regrowth than those in

adults.

"This research provides a valuable baseline from which to assess and treat future pediatric patients presenting with symptoms associated with acoustic neuromas," said lead study author Douglas E. Anderson, MD, chair, Loyola Medicine and Loyola University Chicago Stritch School Department of Neurological Surgery. "Because of the tumor size in children at presentation, appropriate treatments should reflect the risk for tumor regrowth."

The study identified common symptoms in pediatric acoustic neuroma patients: hearing loss in 87% of patients; headache, 40%; vertigo, 33%; ataxia (degenerative disease of the nervous system), 33%; and tinnitus (ringing in the ear), 33%. At the time of surgery, the mean tumor size was 3.3 centimeters, with four patients presenting with 1-centimeter tumors. Four patients had residual tumor mass left following surgery, with three (75%) having significant regrowth requiring further treatment. The literature review identified another 81 patients from 26 studies, with an average age of 12.1 (range 6-21) and an average tumor size of 4.1 centimeters.

More information: Giselle E. K. Malina et al, Pediatric vestibular schwannomas: case series and a systematic review with meta-analysis, *Journal of Neurosurgery: Pediatrics* (2020). DOI: 10.3171/2020.3.PEDS19514

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