Early vs. Late Gamma Knife Radiosurgery Following Transsphenoidal Surgery for Nonfunctioning Pituitary Macroadenomas: a Matched Multi-center Cohort Study

A presentation at the 2017 American Association of Neurological Surgeons Annual Scientific Meeting

Los Angeles, Calif. (April 25, 2017) — Winner of the Leksell Radiosurgery Award, Jason P. Sheehan, MD, PhD, FAANS, presented his research, Early vs. Late Gamma Knife Radiosurgery Following Transsphenoidal Surgery for Nonfunctioning Pituitary Macroadenomas: a Matched Multi-center Cohort Study, during the 2017 American Association of Neurological Surgeons (AANS) Annual Scientific Meeting.

Stereotactic radiosurgery (SRS) is frequently used to treat residual or recurrent nonfunctioning pituitary macroadenomas. There is no consensus as to whether SRS should be used early after surgery or if radiosurgery should be withheld until there is evidence of imaging-defined tumor progression. Given the high incidence of adenoma progression after subtotal resection, the study evaluated the effect of timing of radiosurgery on outcome.

A multi-center study of patients with nonfunctioning pituitary macroadenomas who underwent partial resection followed by SRS from 1987 to 2015 was conducted at nine institutions of the International Gamma Knife Research Foundation. Patients were matched by adenoma types and radiosurgical parameters and stratified based on the interval between resection and radiosurgery. Operative results, imaging and clinical outcomes were compared across groups following early (SRS delivered <= 6 months from the time of resection) or late (SRS delivered > 6 months from the time of resection) radiosurgery.

After matching, 222 patients met the study criteria and were grouped based on early or late SRS following transsphenoidal surgery. There was a greater risk of tumor progression in the late radiosurgical group over a median imaging follow-up period of 68.5 months. No significant difference in occurrence of post-GKRS endocrinopathy was observed. Thirty percent of patients without endocrinopathy in the early cohort developed new endocrinopathies during the follow-up period versus 27 percent in the late cohort. Fourteen percent of the early group and 25 percent of the late group experienced resolution of endocrine dysfunction since original presentation.

Results of the study indicate that early SRS decreases the risk of radiographic progression of sub-totally resected nonfunctioning pituitary macroadenomas compared to expectant management followed by late radiosurgery. Delaying radiosurgery may place patients at increased risk for long-term adenoma progression. Early radiosurgery may be preferred in nonfunctioning pituitary adenoma patients with residual tumor after surgery and a life expectancy of five or more years. The timing of radiosurgery does not appear to significantly affect the rate of delayed endocrinopathy.

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