CASE REPORT:
Hypofractionation of Pituitary Adenoma

New York University Langone Medical Center

- 71 year old male, right handed
- Diagnosed with Prolactinoma in 2009 after he obtained a brain MRI for persistent headaches
- Imaging demonstrated a large right-sided cavernous sinus tumor extending into the parasellar region and the right temporal lobe
- Prolactin level of 2068 at time of diagnosis
MEDICAL TREATMENT

• Started Bromocriptine & Cabergoline (prolactin inhibitors)
• Prolactin level decreased (to as low as 4.8 in 2011) and the tumor regressed
• Patient did not tolerate Cabergoline and it was discontinued
• Prolactin level began to rise slowly and the tumor enlarged and caused right sided diplopia
• Prolactin level of 176 at presentation for radiosurgery
SURGICAL TREATMENT

• Stereotactic Radiosurgery with Leksell Gamma Knife Icon was chosen due to:
  ▪ The large tumor volume
  ▪ The tumor’s proximity to the visual system

• Distance between tumor and optic chiasm: 0-1 mm

• Patient underwent Leksell Gamma Knife radiosurgery using mask fixation in 2016

• Right: Pre-surgery scan (Oct, 2016)
The dose plan consisted of 15 isocenters using 4, 8 and 16 mm collimation.

Five sessions on five consecutive days.

The tumor margin dose was 20Gy at the 50% isodose line, which was delivered as 4 Gy during each one of the five sessions.
WORKFLOW

Treatment: 20Gy in five fractions over five days

1. Mask molding
2. Initial CBCT
3. Brain MRI
4. Dose planning

Steps 1 through 4 were carried out on the day of his first radiosurgery session

5: Treatment Delivery

- CBCT to verify actual skull position
- Automatic co-registration to determine daily shift in translation and rotation
- Automatic adaption by TPS to daily position; recalculation of dose distribution
- Repeated at fraction 2-5
RESULTS

• The patient felt well after radiosurgery

• Prolactin level reduced post surgery

• Significant tumor regression was noted

• Nine months after surgery the patient’s prolactine level had decreased to 72 with Bromocriptine
“LGK Icon was used to allow radiosurgery for a large recurrent pituitary tumor close to the optic chiasm, in the hope of obtaining a tumor response with visual safety as well as reduction in hormone hypersecretion over time.”

- Dr. Douglas Kondziolka
  Director of the Center of Advanced Radiosurgery
  NYU Langone Medical Center