

Table 2: Class III Evidence Detailing Radiosurgery for a Residual/Recurrent NFPA

Author, year	Study Design / Class / Classification Process	Intervention	Follow-up (months)	Tumor control rate	Progressive-free survival (%)	Favorable factor	Unfavorable factor	Hypopituitarism	Other complications
Sheehan ³³ , 2013	Retrospective / III / Therapeutic	GKS for 512	36	93.4%	98%, 95%, 91%, and 85% at 3, 5, 8, and 10 yrs	Smaller adenoma volume	Suprasellar extension	21%	New cranial nerve deficits: 9% New onset optic nerve dysfunction: 6.6%
Wilson ³² , 2012	Case control study / II / Therapeutic	G1: SRS for 51 G2: FSRT for 67 G3: CRT for 53	-	-	At 5 yrs G1:100% G2: 93%, G3: 87%	-	-	-	-
Runge ³⁵ , 2012	Retrospective / III / Therapeutic	LINAC-RS for 61	83	98%	-	-	-	9.8%	New onset optic nerve dysfunction: 0%
Starke ³⁴ , 2012	Retrospective / III / Therapeutic	GKS for 140	60	90%	98%, 97%, 91%, and 87% at 2, 5, 8, and 10 yrs	-	Tumor volume >5 cm ³	30.3%	New cranial nerve deficits: 13.7%, new onset optic nerve dysfunction: 12.8%
Gopalan ³⁸ , 2011	Retrospective / III / Therapeutic	GKS for 48	80.5	83%	-	-	Tumor volume >5 cm ³	39%	New onset optic nerve dysfunction: 9.4%
Iwata ³⁷ , 2011	Retrospective / III / Therapeutic	Hypofractionated SRT for 94	33	-	98%	-	-	4.1%	New onset optic nerve dysfunction: 1%

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Park ³⁶ , 2011	Retrospective / III / Therapeutic	GKS for 125	62	89.6%	99%, 94%, and 76% at 1, 5, 10 yrs		Tumor volume ≥ 4.5 cm ³ , and ≥ 2 prior recurrences	24%	New cranial nerve deficits: 1.6%, new onset optic nerve dysfunction: 0.8%
Hayashi ³⁹ , 2010	Retrospective / III / Therapeutic	GKS for 43	36	97%	-	-	-	0%	Transient new cranial nerve deficits: 2%
Hoybye ⁴⁰ , 2009	Retrospective / III / Therapeutic	GKS for 23	78	95.7%	-	-	-	0%	-
Jagannathan ⁴² , 2008	Retrospective / III / Therapeutic	GKS for 82	44.9	92%	-	-	-	-	-
Pollock ⁴¹ , 2008	Retrospective / III / Therapeutic	GKS for 59	64	97%	95% at 3 and 7 yrs	-	-	32%	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%
Liscak ⁴³ , 2007	Retrospective / III / Therapeutic	GKS for 119	60	100%				1.5%	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%
Mingione ³³ , 2006	Retrospective / III / Therapeutic	GKS for 92	47.9	92%	-	-	Margin dose <12 Gy	19.8%	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%

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Picozzi ³¹ , 2005	Case-control study / II / Therapeutic	G1: obs for 68 G2: GKS for 51	G1: 41.6 G2: 40.6	-	At 5 yrs G1: 51.1% G2: 89.8%	-	-	-	-
Kuo ⁴⁷ , 2004	Retrospective / III / Therapeutic	GKS for 49	20.6	100%	-	-	-	-	-
Losa ⁴⁶ , 2004	Retrospective / III / Therapeutic	GKS for 54	41.1	96%	88.2% at 5 yrs	Higher radiation dose	-	12.5%, 8.6% 2.3% in hypogonadism, hypothyroidism, and hypoadrenalism	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%
Muacevic ⁴⁵ , 2004	Retrospective / III / Therapeutic	GKS for 60	21.7	94%	95%, 90% at 3 yrs and 5 yrs	-	Low maximum dose	4%	-
Petrovich ⁴⁹ , 2003	Retrospective / III / Therapeutic	GKS for 56	36	100%	-	High margin dose	-	-	New cranial nerve deficits: 4% New onset optic nerve dysfunction: 0%

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Pollock ⁴⁸ , 2003	Retrospective / III / Therapeutic	GKS for 32	43	97%	97% at 2 yrs and 5 yrs	-	-	28%	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%
Feigl ⁵² , 2002	Retrospective / III / Therapeutic	GKS for 61	55	94%	-	-	-	49%	-
Sheehan ⁵¹ , 2002	Retrospective / III / Therapeutic	GKS for 42	31.2	98%	-	-	-	0%	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%
Wowers ⁵⁰ , 2002	Retrospective / III / Therapeutic	GKS for 44	57.7	95%	93% at 5 yrs	-	Low maximum dose	10%	-
Mokry ⁵³ , 1999	Retrospective / III / Therapeutic	GKS for 30	20.7	97%	-	-	-	20%	New cranial nerve deficits: 0% New onset optic nerve dysfunction: 0%
Lim ⁵⁴ , 1998	Retrospective / III / Therapeutic	GKS for 22	26.3	100%	-	-	-	-	-

GKS: gamma knife radiosurgery, yrs: years