ACOUSTIC NEURINOMA

CASE

↳ Female Patient, 42Y, C72.4

↳ Prescription → SRT: 2100 cGy (3 × 700 cGy)

STRUCTURE SET

↳ PTV, Brain, Brain Stem (PRV), Chiasm (PRV), Cochlea (R/L), Eyes (PRV), Lens (PRV), Lacrimal Gland, Medula (PRV), Optic Nerve (PRV),

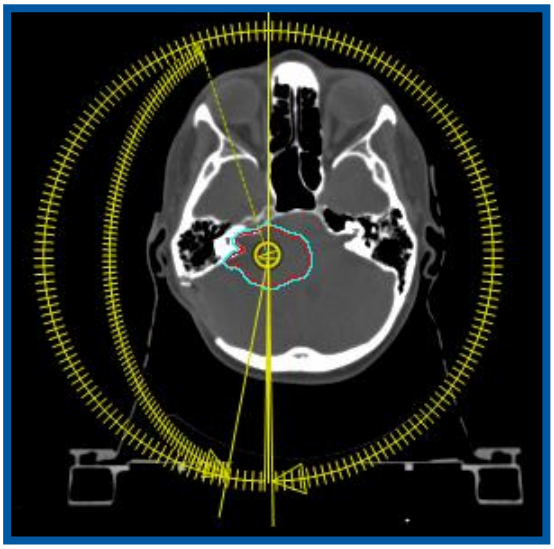
↳ **CT Slice:** 1 mm

FIELD CONFIGURATION

LINAC → Varian TrueBeam

ENERGY → 6 MV FFF

GEOMETRY → 3 non-coplanar fields

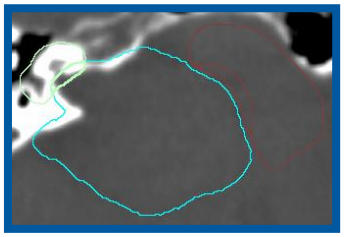


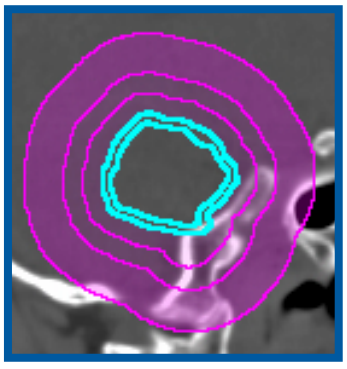
3 NON COPLANAR FIELDS			
Field	1_CW_T0	2_CCW_T315	3_CCW_T270
Gantry	181° → 179°	335 → 195°	195° → 335°
Colimator	10°	100°	100°
Table	0°	315°	270°

ARC GEOMTRY TOOL

↳ Fine-tuning of the isocenter with 5 mm margin

OPTIMIZATION STRATEGY: SHULMAN METHOD





↳ PTV: Overlap with brain stem and right cochlea
Lower (99% volume, 2000 cGy, w: 100 ~ 250)

↳ GTV: Lower (65% volume, 2300 cGy, w: 85 ~ 100)

↳ zPTV: 0 mm crop of the brain stem PRV and right cochlea
Upper (0% volume, 2450 cGy, w: 0 / 100)
Lower (95% volume, 2000 cGy, w: 150 ~ 200) I Lower (98% volume, 2000 cGy, w: 100 ~ 150)

↳ PTV_Core: 2 mm margin from PTV
Upper (0% volume, 2450 cGy, p: 0 / 100) I Lower (99.9% volume, 2160 cGy, w: 100 ~ 150)

↳ PTV_Shell: 2 mm crop from zPTV inside the PTV_Shell
Upper (0% volume, 2200 cGy, w: 150 ~ 200) I Lower (99.5% volume, 2000 cGy, w: 100 ~ 150)

↳ zCoclea_ovl: 2 mm crop from zPTV inside the PTV_Shell
Upper (0% volume, 2180 cGy, w: 150 ~ 200) I Lower (98% volume, 2000 cGy, w: 150 ~ 200)

↳ zTronco_PRV_ovl: 2 mm crop from zPTV inside the PTV_Shell
Upper (0% volume, 2180 cGy, w: 150 ~ 200) I Lower (98% volume, 2000 cGy, w: 150 ~ 200)

↳ Rings:

↳ 1_Ring@0-5 mm: Upper (0% volume, 2000 cGy, w: 85 ~ 200)

↳ 2_Ring@5-10 mm: Upper (0% volume, 1500 cGy, w: 85 ~ 150)

↳ 3_Ring@10-20 mm: Upper (0% volume, 1000 cGy, w: 85 ~ 150)

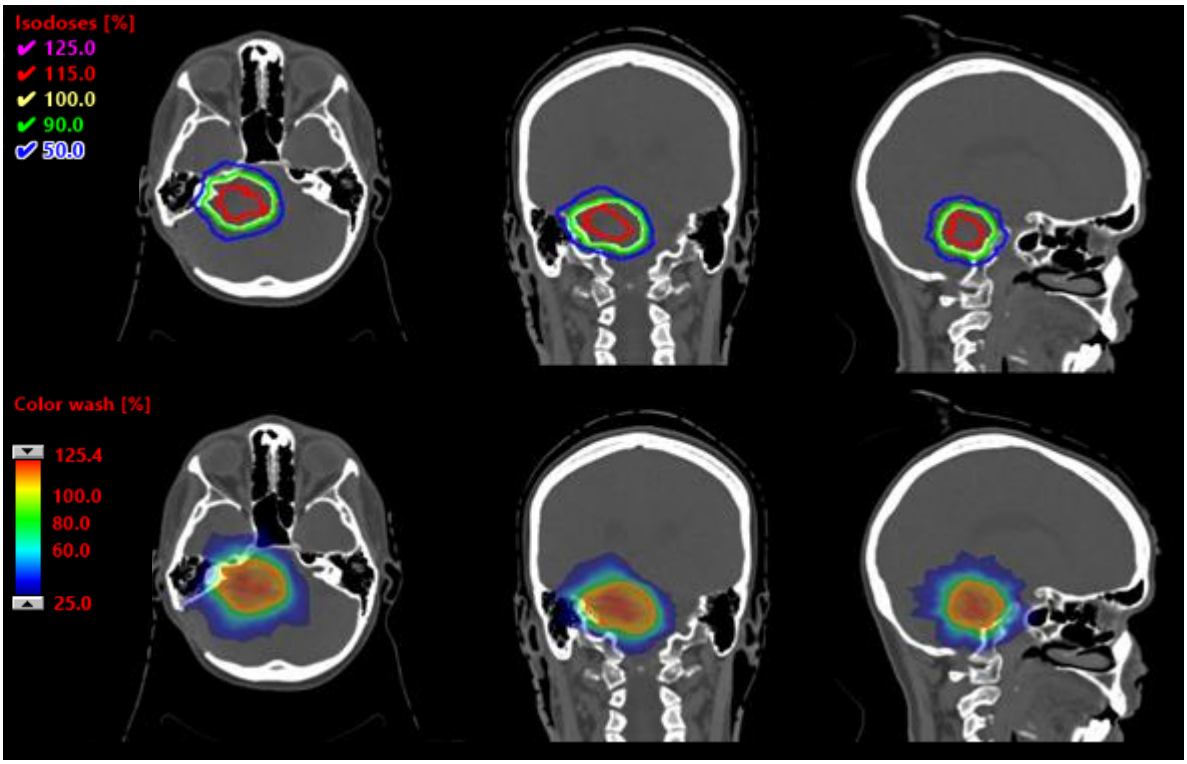
↳ Low_Dose_Control: Brain – 3_Ring@10-20mm (0 mm margin) → Upper (0% volume, 350 cGy, w: 150 ~ 300)

↳ NTO: Priority: 95, Target Distance: 2.0, Start Dose: 40, End Dose: 40, Fall-Off: 0.05 → helps Low_Dose_Control

OAR → Brain Stem (PRV), Chiasm (PRV), Eyes, Optic Nerve → Timmerman 5 fractions: Upper (w: 150 ~ 300)

↳ zOAR → zRight_Cochlea, zBrainStem_PRV → ALARA: Upper (w: 75 ~ 100), Mean (w: 55)

DOSE DISTRIBUITION (ISOCENTER PLANE)



DVH STATISTICS

STRUCTURE	DVH OBJECTIVE	IDEAL	ACCEPTABLE	RESULT	VALUE
PTV 3x700 CGY	D95% [Gy]	>= 20.00 **(100%)**	>= 19.60 **(98%)**		20.29 Gy
	CI	<= 1.2	<= 1.4		1
	R50%	<= 4.5	<= 5.5		2.63
RING@0-5MM	V105%	<=2	3		0.05 cc
RING@0-5MM	Máx [%]	110	115		109.1 %
BRAIN STEM	V 23 Gy [cc]	<= 0.5	-		0.00 cc
BRAIN STEM PRV	Máx [Gy]	31 Gy	-		22.33 Gy
CHIASM	V 23 Gy [cc]	<= 0.2	-		0.00 cc
CHIASM PRV	Máx [Gy]	25 Gy	-		3.53 Gy
MEDULA	V 23 Gy [cc]	<= 0.35	-		0.00 cc
	V 14.5 Gy [cc]	<= 1.2	-		0.00 cc
MEDULA (PRV)	Máx [Gy]	30 Gy	-		5.33 Gy
R_OPTIC NERVE D	V 23 Gy [cc]	<= 0.2	-		0.00 cc
R_OPTIC NERVE (PRV)	Máx [Gy]	25 Gy	-		2.25 Gy
R_OPTIC NERVE	V 23 Gy [cc]	<= 0.2	-		0.00 Gy
L_OPTIC NERVE (PRV)	Máx [Gy]	25 Gy	-		1.75 cc
R_COCHLEA (PRV)	Máx [Gy]	22 Gy	25 Gy		21.48 Gy
L_COCHLEA (PRV)	Máx [Gy]	22 Gy	25 Gy		3.36 Gy
R_EYE (PRV)	V 27.5 Gy [cc]	<= 0.3	-		0.00 cc
L_EYE (PRV)	V 27.5 Gy [cc]	<= 0.3	-		0.00 cc
R_LENS (PRV)	Máx [Gy]	<= 6 Gy	-		1.03 Gy
L_LENS (PRV)	Máx [Gy]	<= 6 Gy	-		1.27 Gy
R_LACRIMAL GLAND	Mean [Gy]	<= 20 Gy	-		0.72 cc
L_LACRIMAL GLAND	Mean [Gy]	<= 20 Gy	-		0.61 cc

REFERENCE

TIMMERMAN, Robert. A story of hypofractionation and the table on the wall. **International Journal of Radiation Oncology, Biology, Physics**, v. 112, n. 1, p. 4-21, 2022.