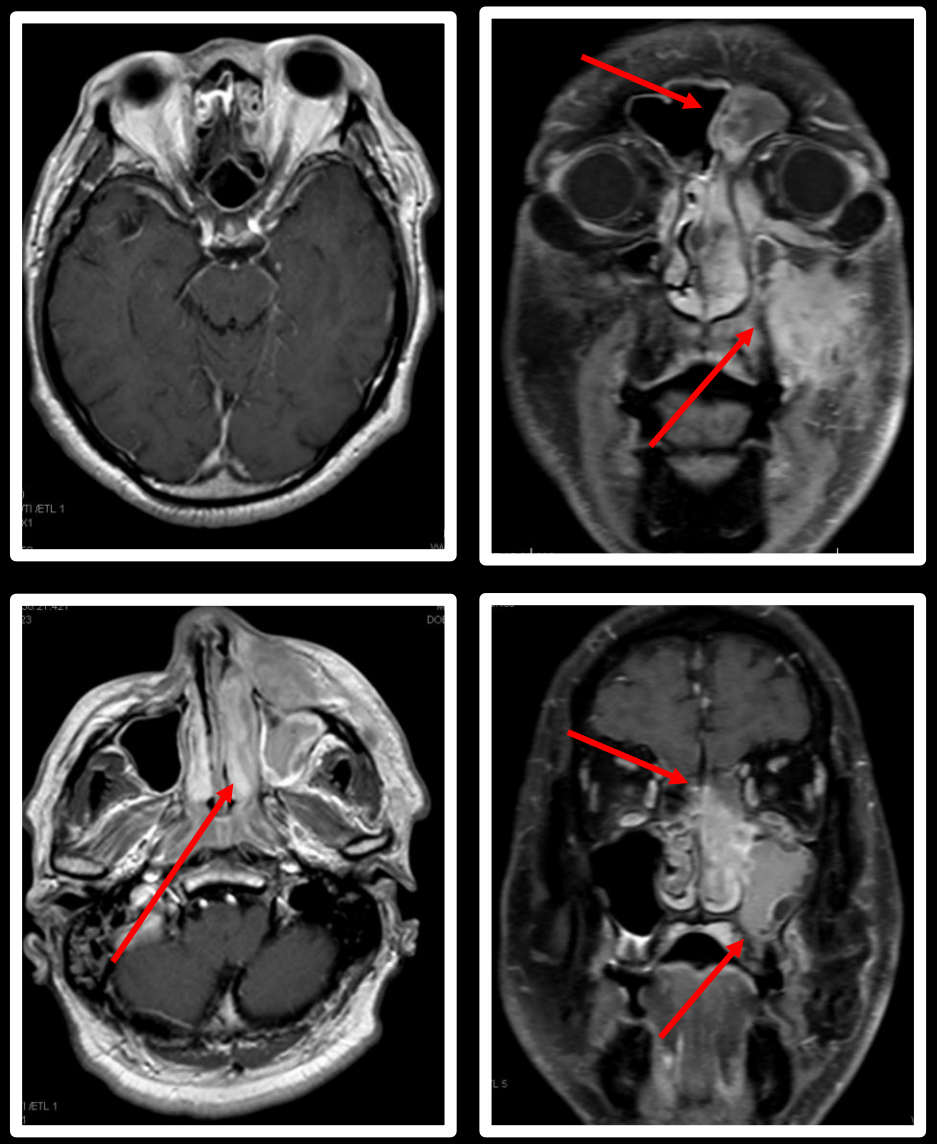
ILROG Mini-Atlas: Nasal NK T cell lymphoma Location

61-year-old male presents with stage II nasal NK T-cell lymphoma.

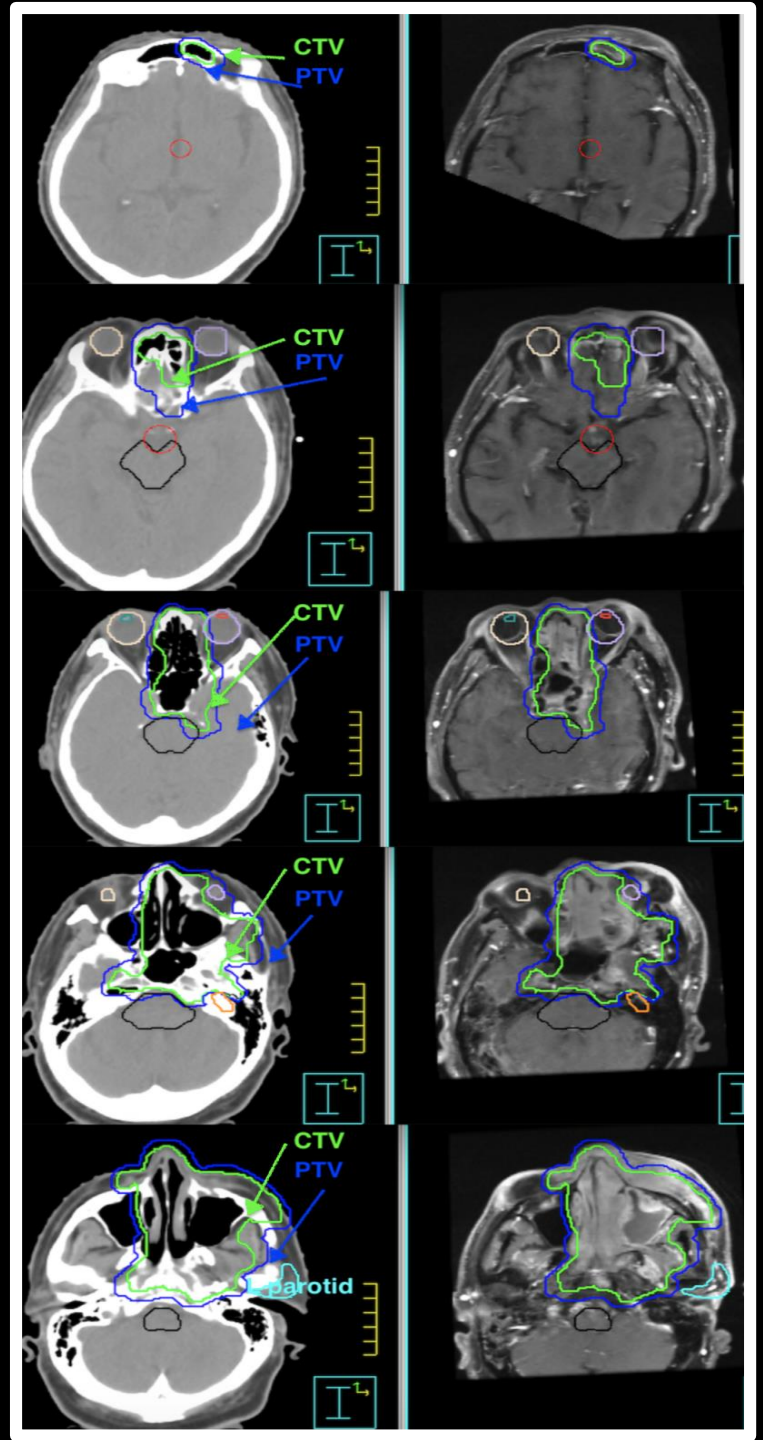
There was extensive local disease involving but not limited to, the left nasal cavity, the premaxillary region, lateral maxilla, buccal space infraorbital nerve, nasopharyngeal space, clivus, left pterygopalatine fossa, foramen rotundum and extension back through the cavernous sinus into Meckel's cave, affecting several cranial nerves (indicated by arrows on the axial and coronal MRI images.

Definitive treatment with radiation therapy concurrently with DeVIC (dexamethasone, etoposide, ifosfamide and carboplatin) chemotherapy was planned.[1]

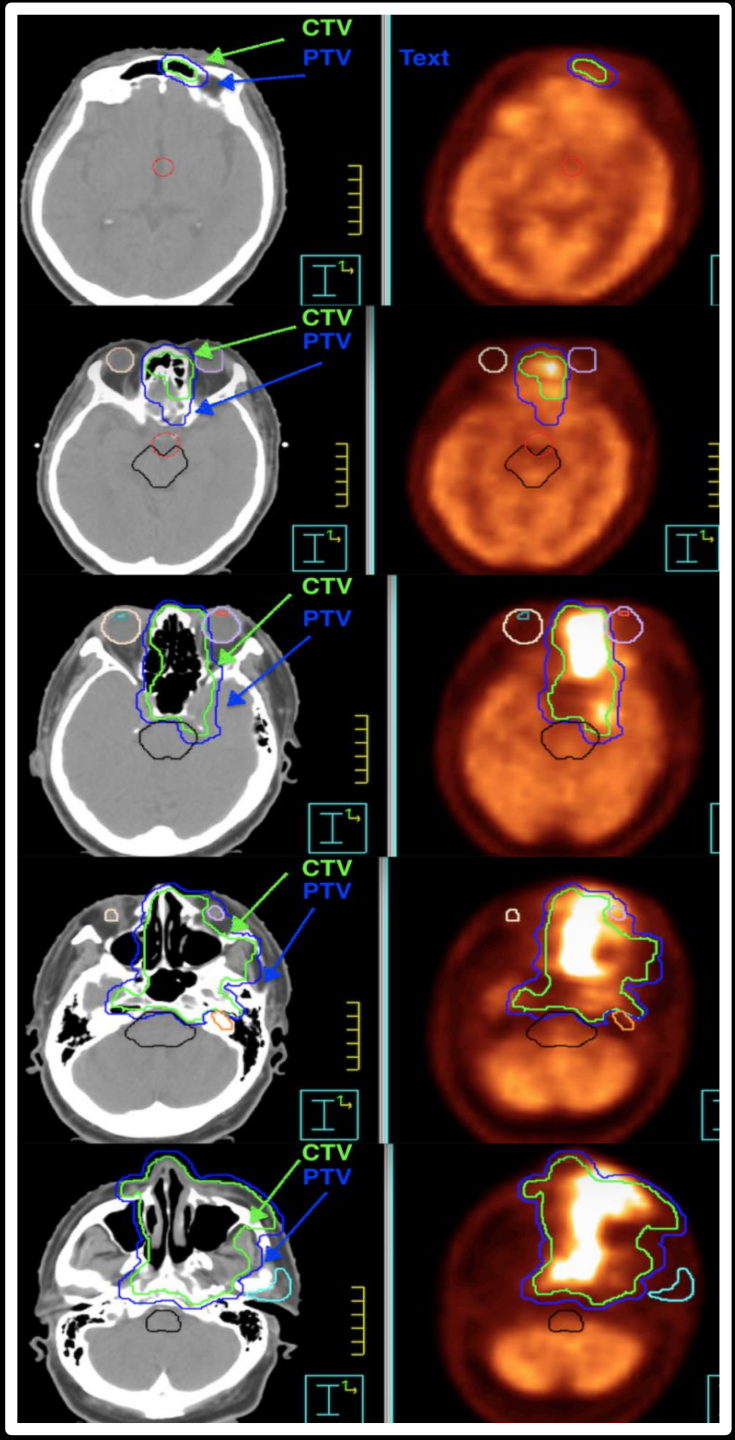


[1]Ueda et al Blood 2014 124:1702)

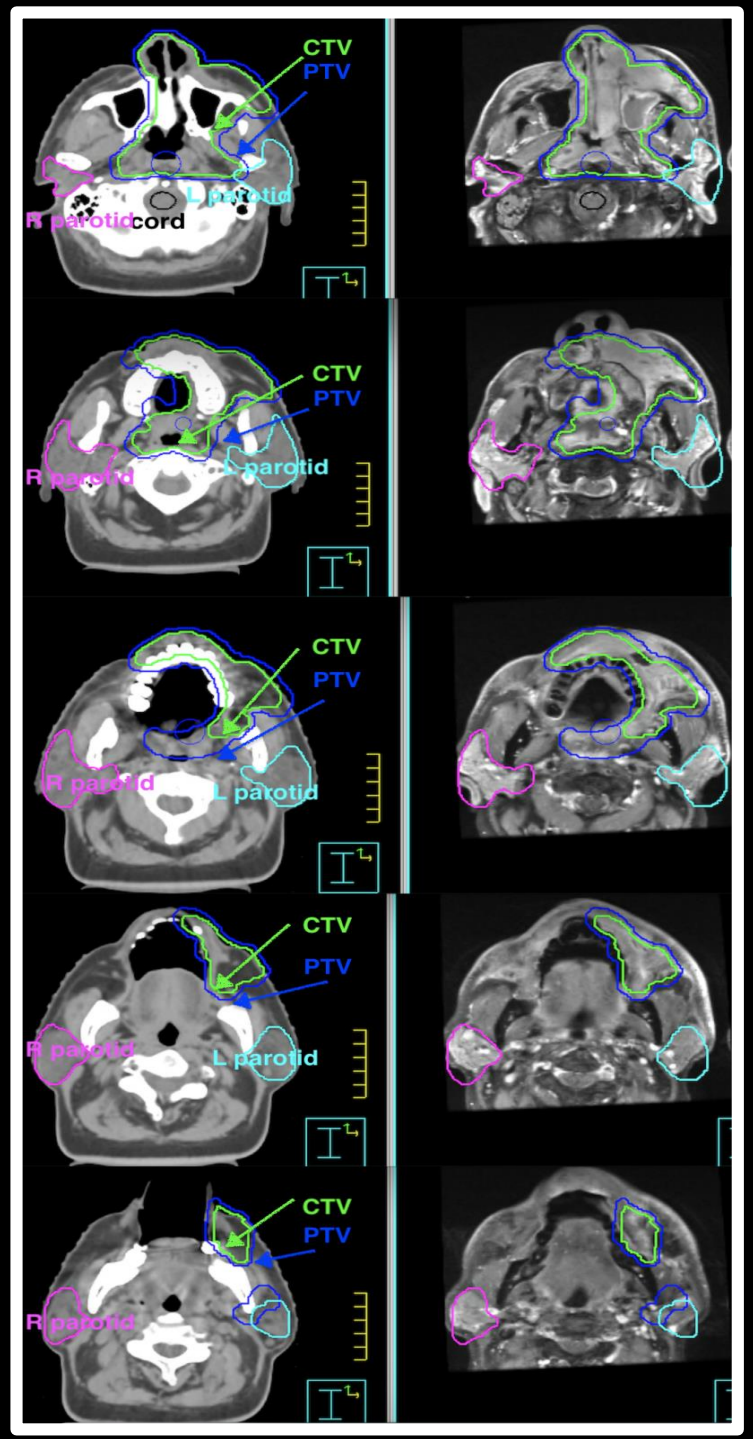
Axial images of CT simulation (left) with corresponding MRI at presentation (right). The CTV (green), was expanded by 3 mm to create the PTV (blue). Elective neck nodes where not included in this case, although the decision to include neck nodes could also be considered appropriate.



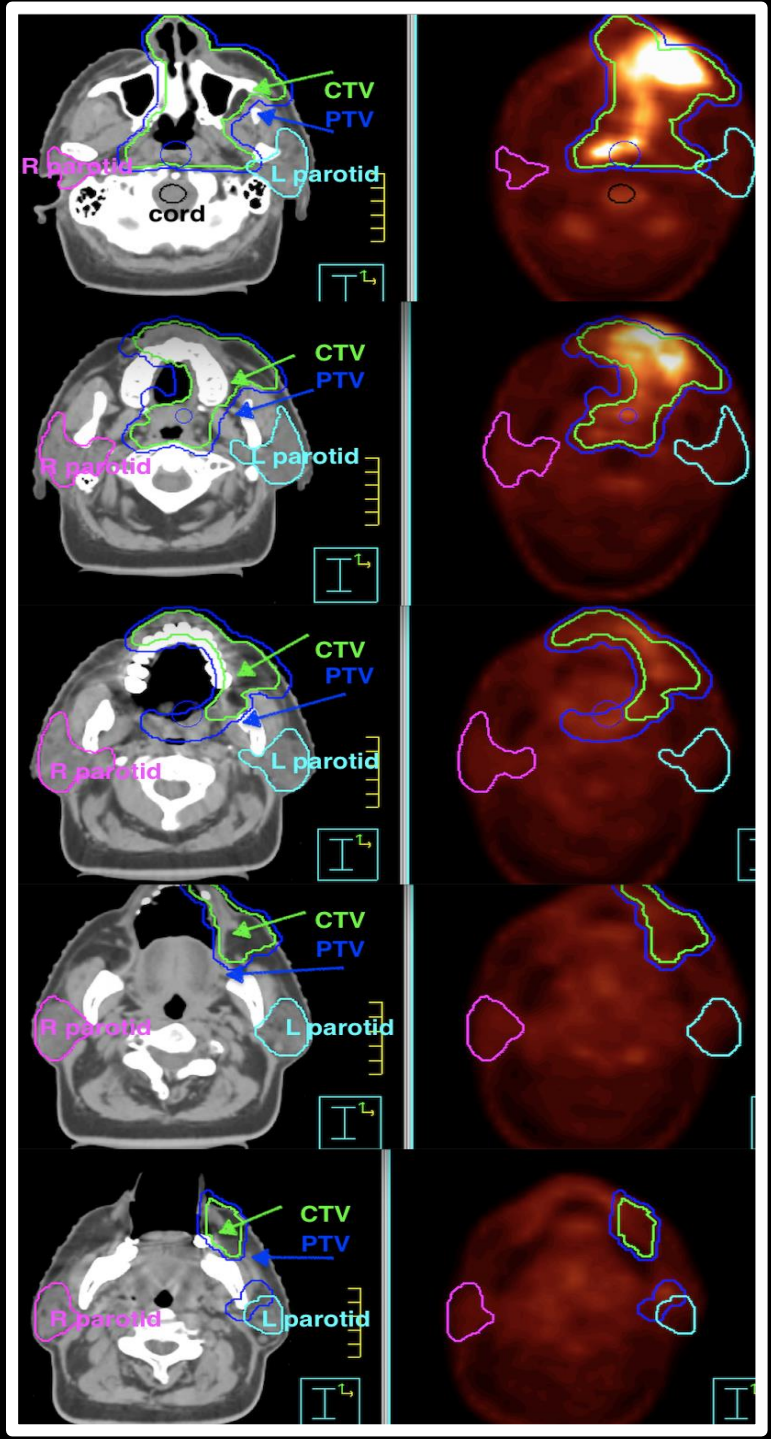
Axial images of CT simulation (left) with corresponding PET-CT at presentation (right). The CTV (green), was expanded by 3 mm to create the PTV (blue).



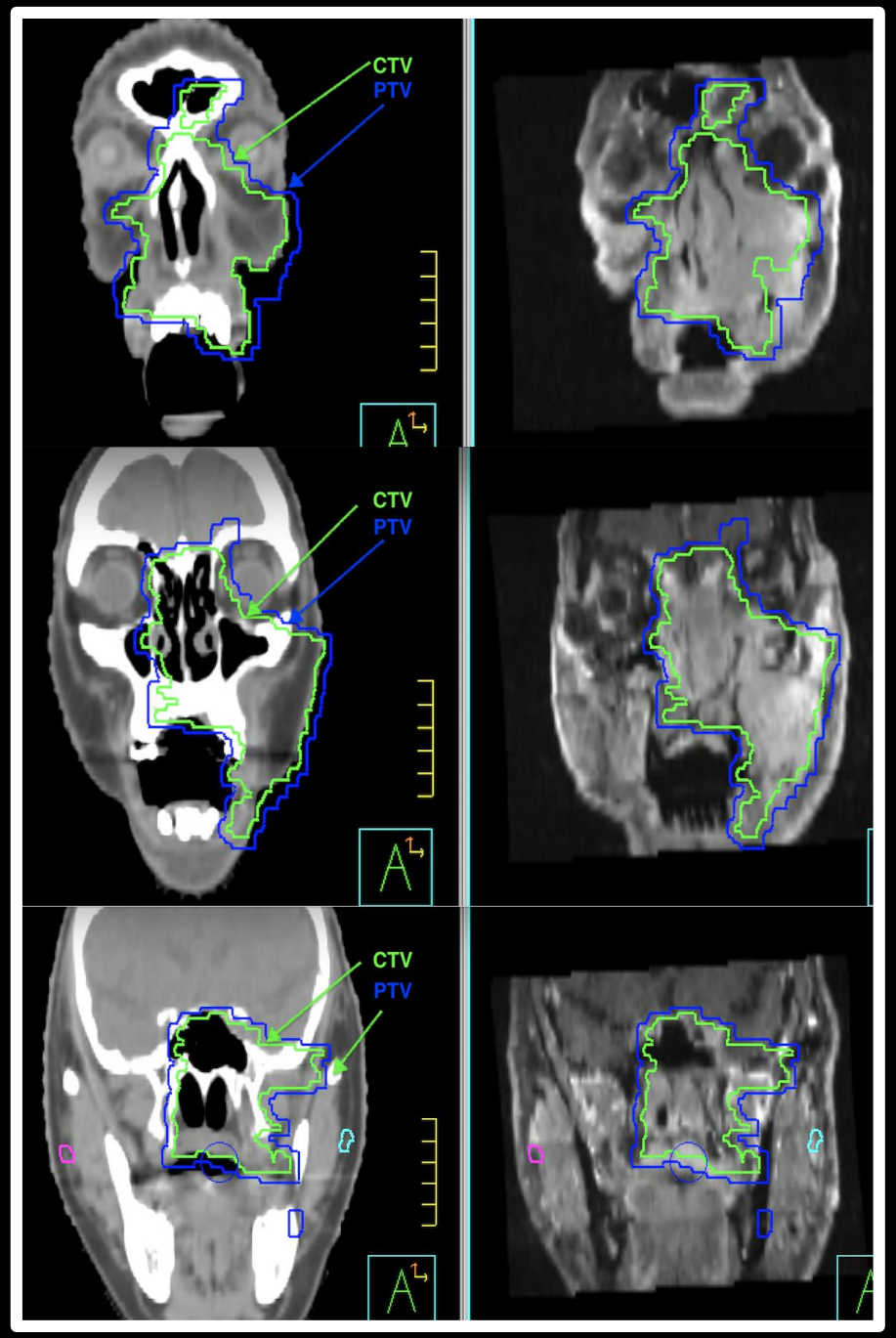
Axial images of CT simulation (left) with corresponding MRI at presentation (right). The CTV (green), was expanded by 3 mm to create the PTV (blue).



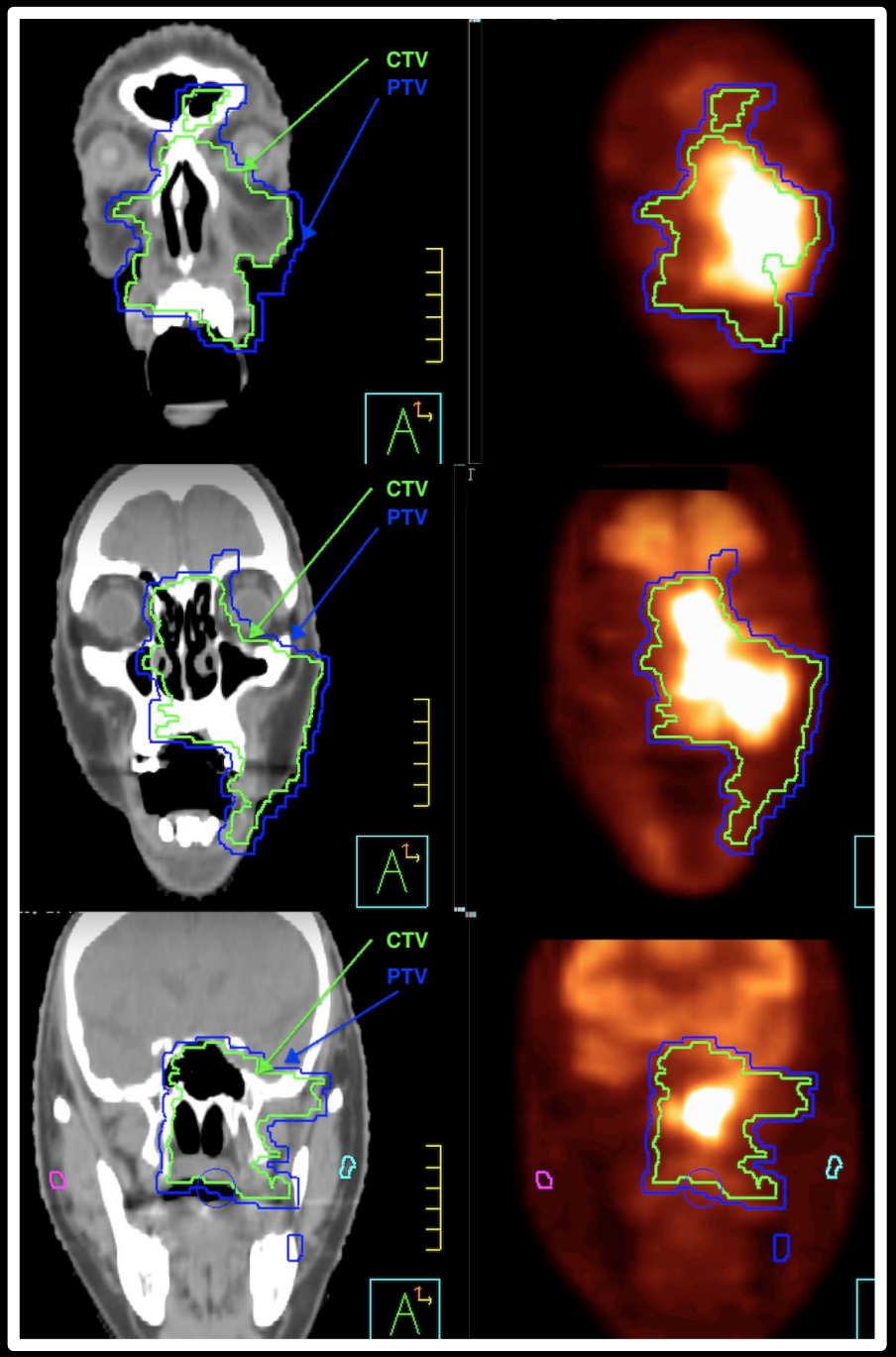
Axial images of CT simulation (left) with corresponding PET-CT at presentation (right). The CTV (green), was expanded by 3 mm to PTV (blue).



Coronal images of CT simulation (left) with corresponding MRI at presentation (right). The CTV (green), was expanded by 3 mm to create the PTV (blue).

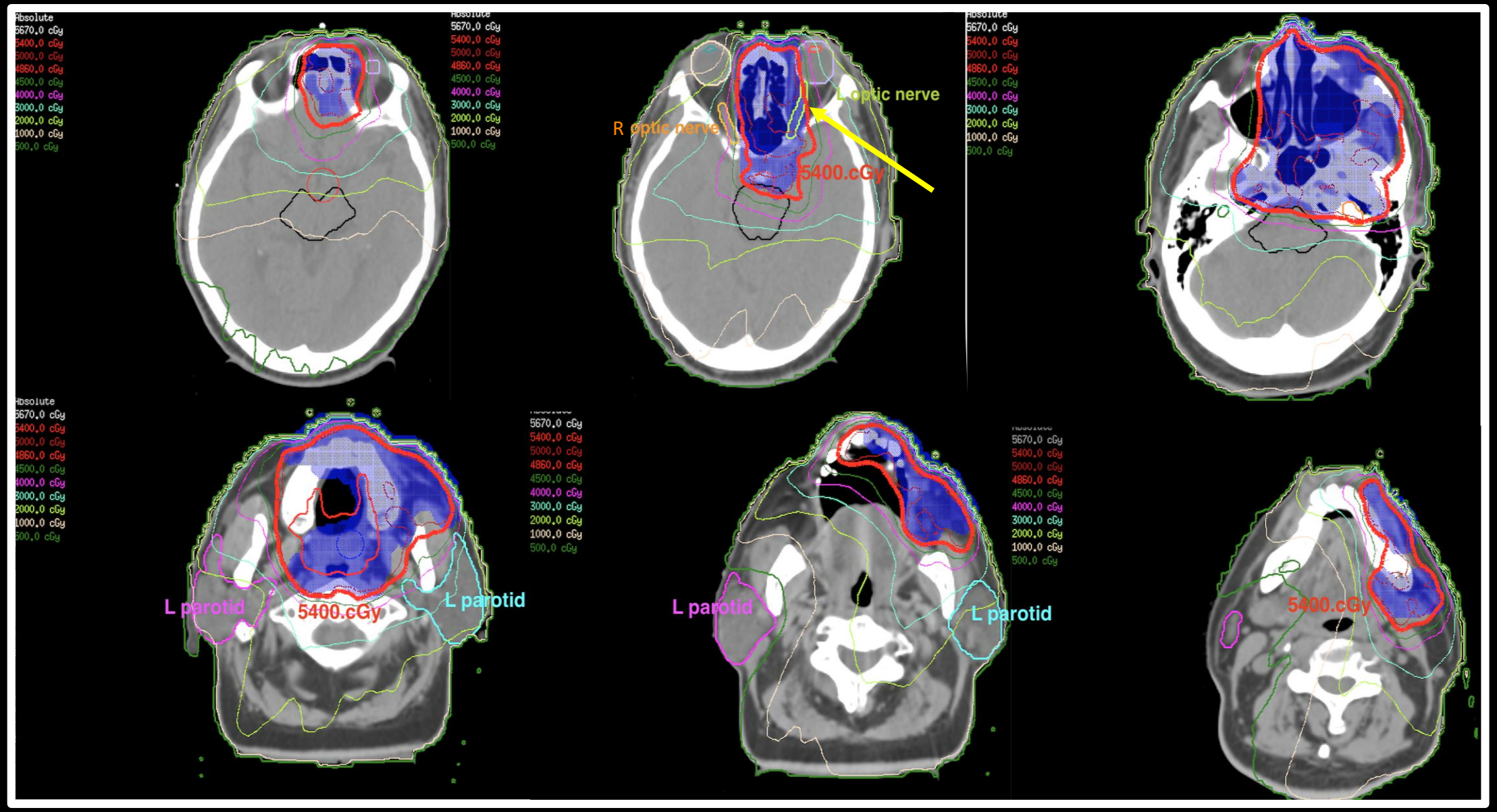


Coronal images of CT simulation (left) with corresponding PET/CT at presentation (right). The CTV (green), was expanded by 3 mm to create the PTV (blue).

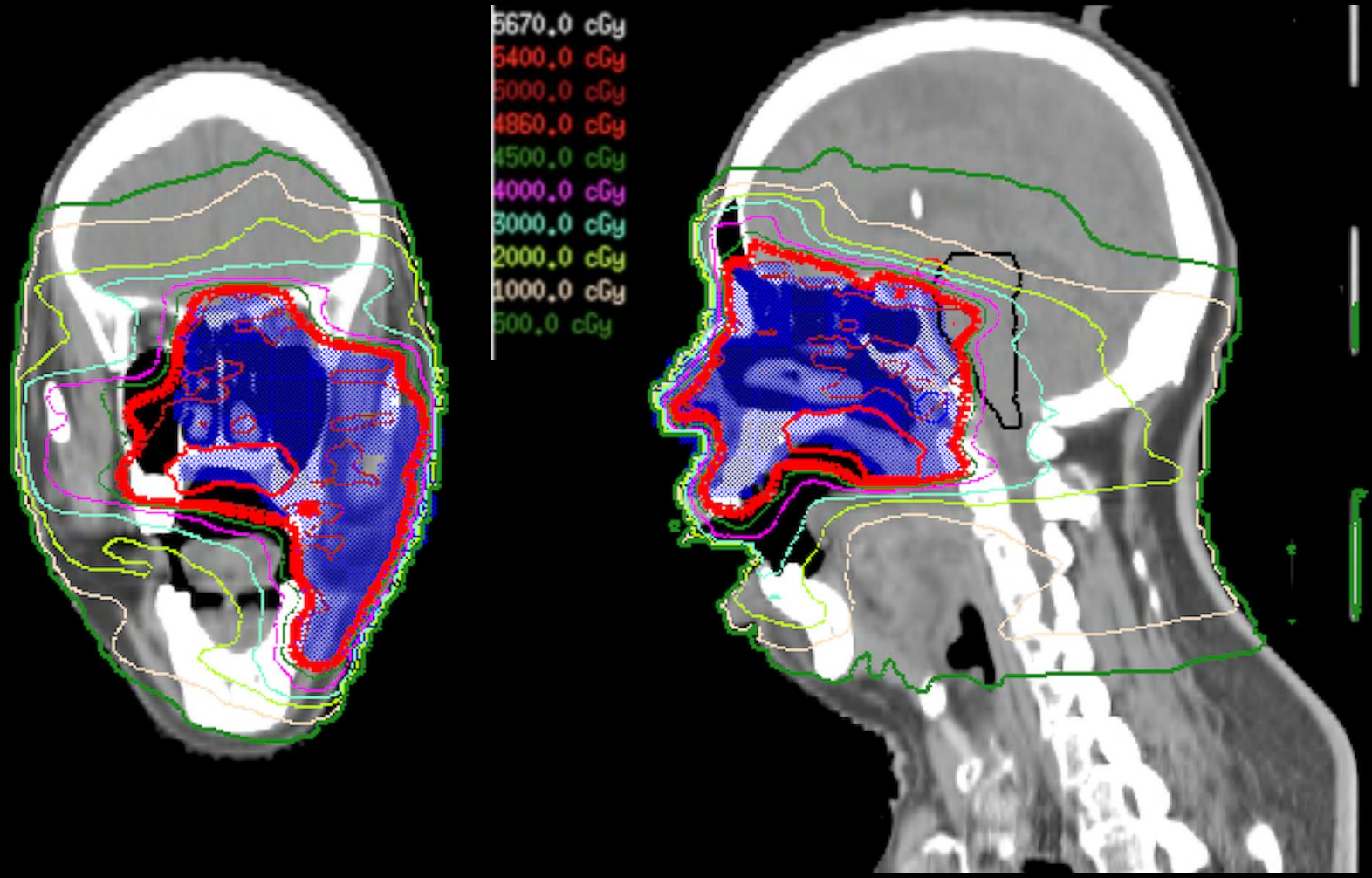


Planning using IMRT encompassing the PTV (blue) with 5400 cGy (isodose line in red). A prescription dose of 5000 Gy is also acceptable.

Encompassing the disease takes priority resulting in partial inclusion of the left optic nerve within the 54 Gy target dose (yellow arrow)



Planning using IMRT encompassing the CTV with 5400 cGy, coronal (left) and sagittal images (left)



Given the critical role of RT in disease control of limited stage NK T-cell lymphoma, disease coverage takes precedent in treatment planning even at the expense of neighboring organs at risk.

A discussion with the patient is required when exceeding tolerance doses for normal tissues in order to achieve adequate doses to the target volumes.

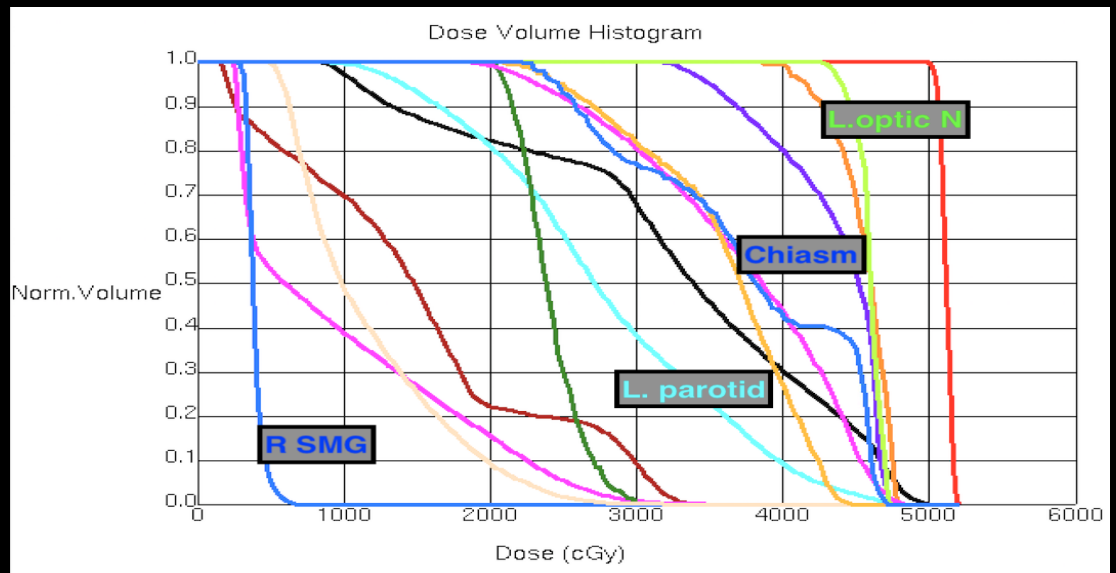
In this case the doses for the following organs were above tolerance:

1-Left Cochlea (mean dose of 38.6 Gy, max of 47.9 Gy)

2-Left orbit (max dose of 4831 cGy)

3-Left parotid (mean dose of 27.8 Gy)

4-Left submandibular gland (mean dose of 43.3 Gy)



ROI Statistics

Line Type	ROI	Trial or Record	Min.	Max.	Mean	Std. Dev.
	PTV_5000	Lt Face	4940.7	5204.3	5114.9	36.1
	SpinalCord	Lt Face	145.3	3399.0	1500.9	902.2
	BrainStem	Lt Face	804.2	4994.4	3269.9	1132.1
	Parotid_L	Lt Face	--	4805.1	2780.5	856.8
	Parotid_R	Lt Face	196.1	3462.0	975.5	790.0
	Cochlea_R	Lt Face	2028.4	2995.8	2406.7	209.7
	Cochlea_L	Lt Face	3859.8	4792.4	4549.0	191.8
	Glnd_Submand_R	Lt Face	291.8	662.0	389.7	57.5
	Glnd_Submand_L	Lt Face	3064.3	4751.7	4339.0	391.9
	Eye_R	Lt Face	389.0	3178.6	1161.3	529.5
	Eye_L	Lt Face	1756.0	4831.7	3703.0	730.5
	OpticNrv_R	Lt Face	1995.6	4473.7	3587.9	562.1
	OpticNrv_L	Lt Face	4227.1	4741.4	4587.5	90.6
	OpticChiasm	Lt Face	2210.7	4709.4	3770.3	779.0

Take home message:
NK T cell lymphoma is a very aggressive disease, as opposed to other subtypes of lymphoma, the target should include any clinically or radiographically suspicious site.

Covering the target takes priority over respecting the critical organs tolerance, however discussions with the patient are required during the consent process.

Radiation therapy course can be challenging for patients, however treatment breaks are highly discouraged, as this can negatively impact disease control and outcome.

In cases of severe mucositis develops a PEG tube should be considered to maintain adequate nutritional status

For patients who present with large tumors compromising critical organs, if disease response occurs during treatment, adaptive planning can be considered to reduce doses to organs at risk.