

Kantonsspital
St.Gallen 

Head and Neck Cancer

Radio Oncology

L. Plasswilm

Kantonsspital St.Gallen – ein Unternehmen, drei Spitäler: St.Gallen Rorschach Flawil

- Basics
- Technique
- Indication
- Treatment Results
- Toxicity

BASICS



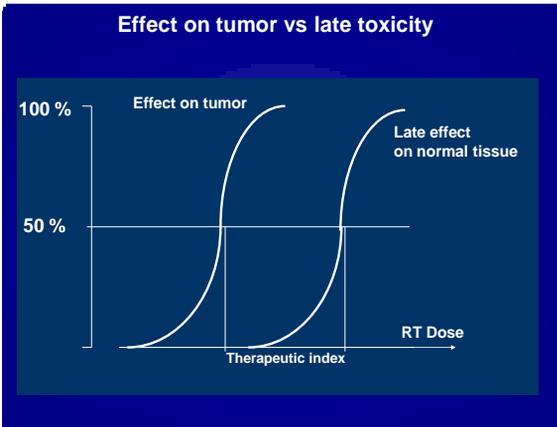
Direct & Indirect Damage of Radiation

Ionizing Radiation

DNA damage

Cascades of signaling events

Repair Cell cycle checkpoints Cell death (apoptosis)

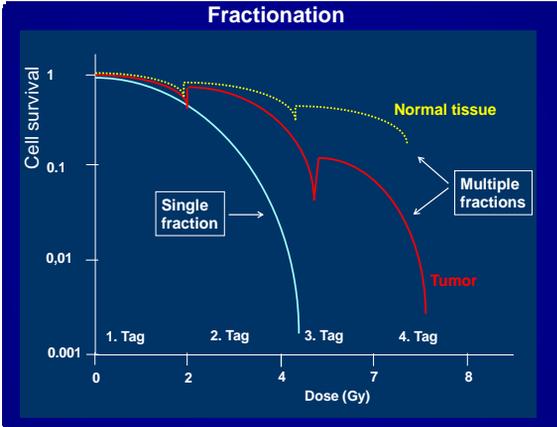


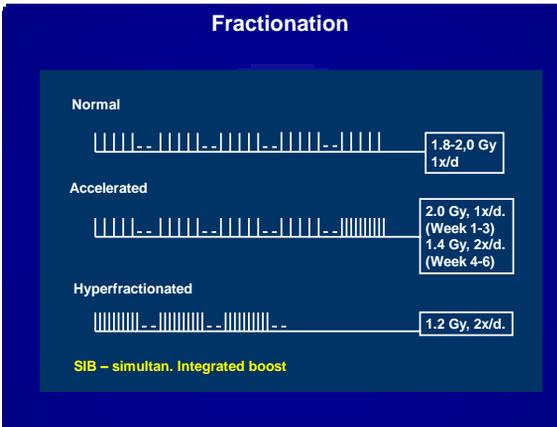
Dosage / Schedule

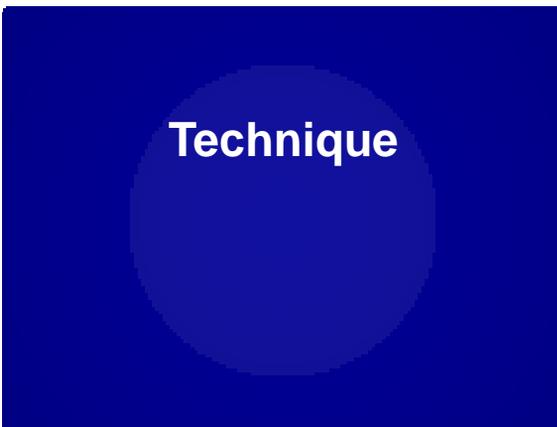
- Total Dose
- Fractionation

• Total Dose

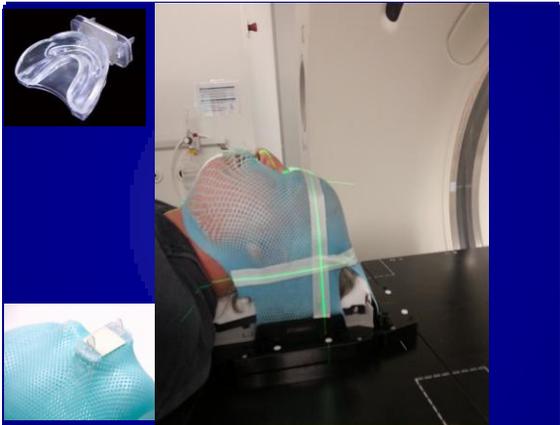
• Fractionation

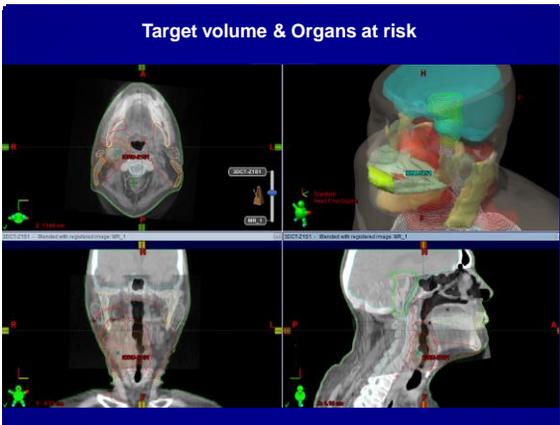


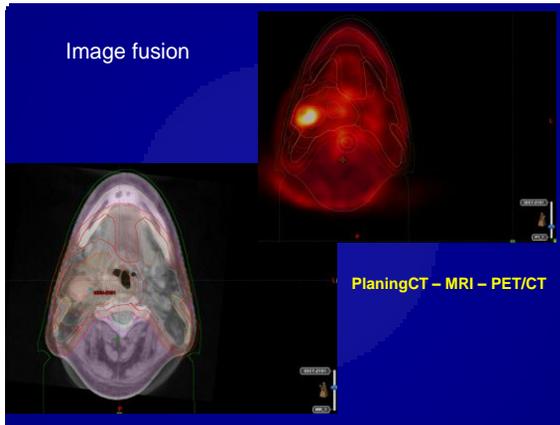


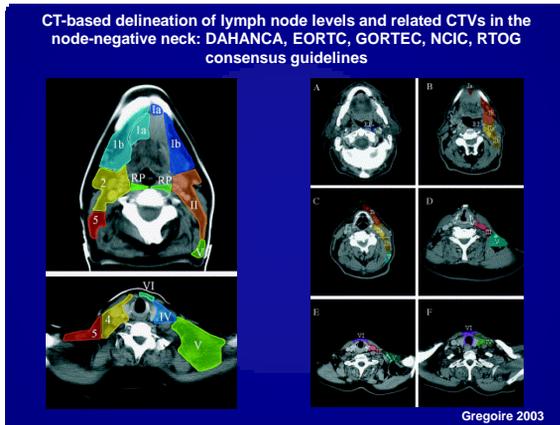








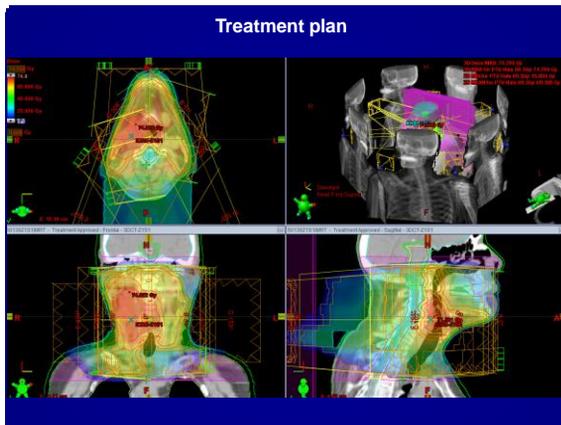


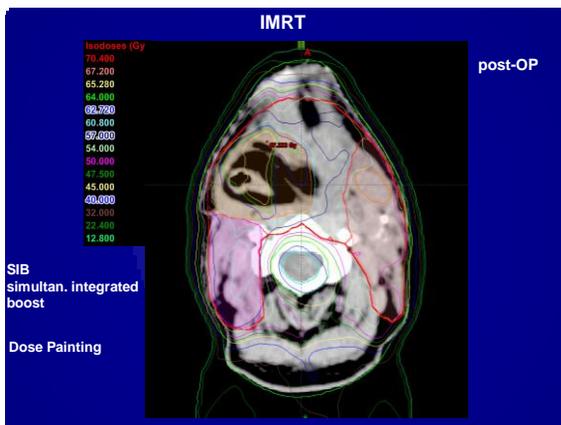


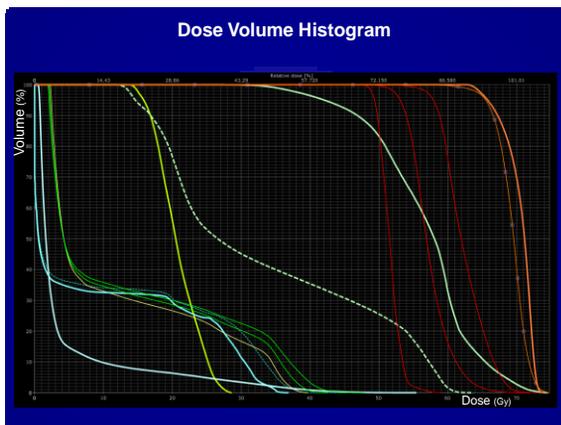
IMRT: Intensity Modulated Radiotherapy

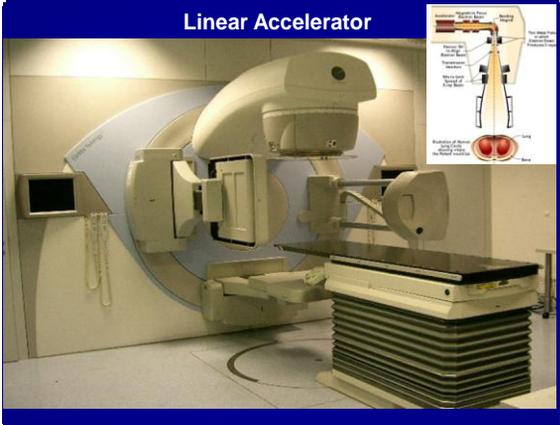
- Variable dose across the field to achieve a specifically designed intensity pattern
- Sum of all fields in 3D space delivers high doses to irregularly shaped volumes
- non-uniform field intensity

! time consuming !

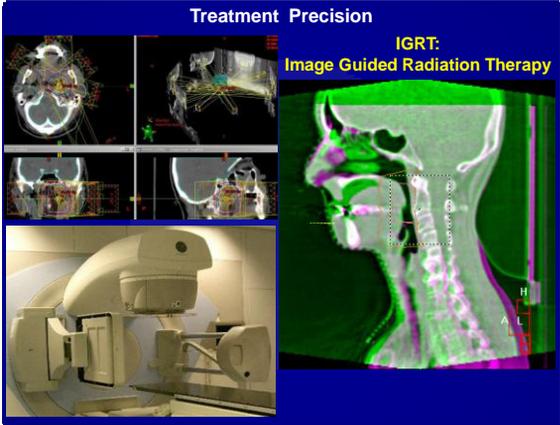












Indication

RT / RCT

Primary operated



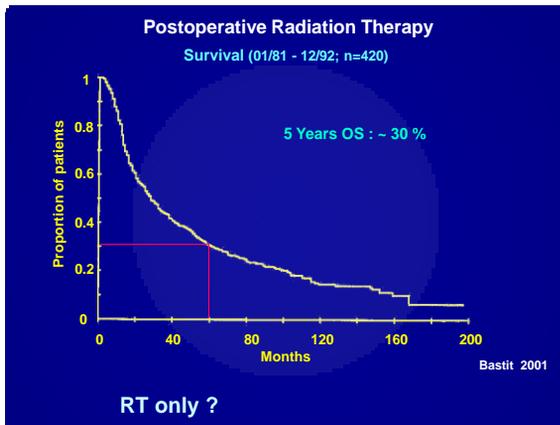
Post Operative RT / RCT ? !

Post Operative RT / RCT

Primary tumor: - R1 / R2
- pT3 / pT4

Lymphnodes: - R1 / R2
- N involvement

but: 1-2 involved nodes ?



Radiotherapy vs. Radiochemotherapy post-OP

Postoperative Irradiation with or without Concomitant Chemotherapy for Locally Advanced Head and Neck Cancer (EORTC)

"Postoperative concurrent administration of high-dose cisplatin with radiotherapy is more efficacious than radiotherapy alone"

Bernier 2004

Postoperative Concurrent Radiotherapy and Chemotherapy for High-Risk Squamous-Cell Carcinoma of the Head and Neck (RTOG)

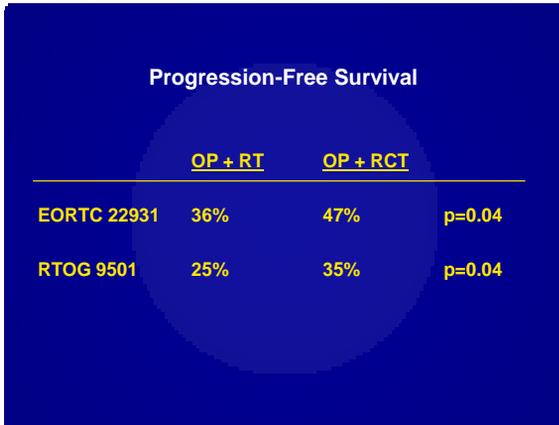
"Among high-risk patients with resected head and neck cancer, concurrent postoperative chemotherapy and radiotherapy significantly improve the rates of local and regional control and disease-free survival. However, the combined treatment is associated with a substantial increase in adverse effects"

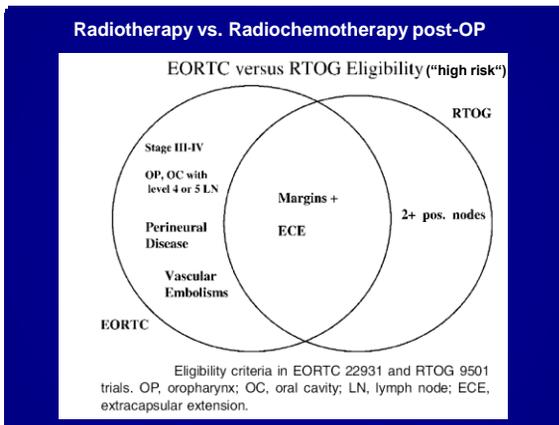
Cooper 2004

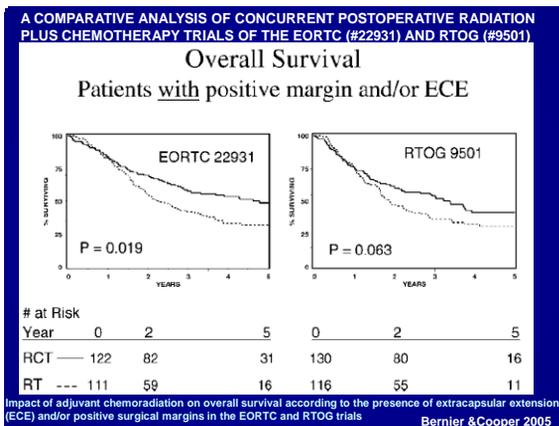
Locoregional Control

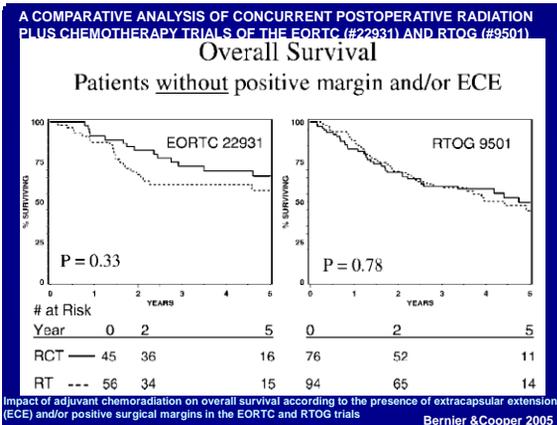
	OP + RT	OP + RCT	
EORTC 22931	69%**	82%**	p=0.007
RTOG 9501	72%*	82%*	p=0.01

*2years **5years









Primary not operated

Radiotherapy

Radiochemotherapy (see also B. Gay)

Radiotherapy

Standard fractionation:
2 Gy/fract., 70 Gy / 35 fract. / 7weeks

Hyperfractionation:
1.2 Gy/fract., twice daily, 81.6 Gy / 68 fract. / 7weeks

Accelerated fractionation with split:
1.6 Gy/fract., twice daily, 67.2 Gy / 42 fract. / 6weeks
2-week rest after 38.4 Gy

Accelerated fractionation with concomitant boost:
1.8 Gy/fract./day to large field
+ 1.5 Gy/fract./day to boost for the last 12 treatment days
72 Gy / 42 fract. / 6 weeks

RTOG 9003

RCT: Acute adverse effects

Merlano et al. 1996	∅
Al Sarraf et al. 1998	↑
Calais et al. 1999	↑
Adelstein et al. 2000	↑
Wendt et al. 1998	↑
Brizel et al. 1998	∅
Jeremic et al. 1999	↑
Dobrowsky et al.	↑
Staar et al. 2000	∅
Budach et al. 2005	∅

(RT-Dose at RCT₁)

➡ Supportive treatment !!!

RCT: Late adverse effects

Merlano et al. 1996	↑
Calais et al. 1999	↑
Adelstein et al. 2000	∅
Wendt et al. 1998	∅
Brizel et al. 1998	∅
Jeremic et al. 1999	∅
Budach et al. 2005	∅

(RT-Dose at RCT₁)

Concomitant Chemoradiotherapy as Primary Therapy for Locoregionally Advanced Head and Neck Cancer

Quality of life before, during and after treatment*

QOL domainst*	before	during	after
Emotional	15.93	16.89	16.53
Social	22.94	22.31	23.70
Functional	18.37	14.82	16.12
Physical	22.32	18.30	21.79
Overall QOL	86.27	80.53	84.68

Abbreviation: QOL, quality of life
 * Higher scores indicate better QOL.
 † Pretreatment/ ontreatment comparisons are based on n of 30 to 33; pretreatment/ 12-month comparisons are based on n of 33 to 34

Vokes 2000

„take home“**Indication:**

No OP: Radiochemo., EGFR-I, altered fractionated RT
Post OP: low risk of recurrence — no RT
intermediate risk of recurrence — RT
high risk of recurrence — RCT

Technique:

IMRT (CT-Planing, MRI, PET); IGRT

Dose:

TD: 50 – 56 – 64 - > 70 Gy; SD: 1.2 – 2.0 / > 2,0 Gy

Treatment duration:

5½ - 7½ weeks

Treatment results:

curative intention, 5 years OS : 25 - 65 %

Adverse effects:

Inflamation (mucosa, skin), Xerostomia, Edema, Fibrosis, Necrosis
