Data seems to be excessively positive and we suppose that a defence mechanism overturns our hypothesis.
Conclusions: Our aim is to go on with the study in order to evaluate if radiotherapy patients show a prevalence of the Type C coping style (Temoshok, 1985) wich is often associated with the oncological disease and can be considered as a precursor of cancer and so, for this reason, they do not express emotions like fear, anxiety or sadness, they are unassertive, cooperative and appeasing social and family.
Type C could be the behaviour pattern that patients use to cope with outer stress and inner distress.

2022 POSTER

Quality Improvement of Breast Irradiation Using Intensity-Modulated Radiation Therapy (IMRT) and a Simultaneous Integrated Boost (SIB) With an Instant Re-planning Radiation Therapy (IRRT) Technique

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Background: IMRT treatment coupled with IGRT produces extraordinary levels of precision and accuracy for external beam radiation therapy. In addition, IMRT techniques are capable of treating several targets simultaneously at varying levels of dose. However, despite the ability of IGRT to efficiently adjust for a single target's motion, it may be impossible to achieve setup corrections for multiple, independently moving targets. Breast irradiation that uses IMRT with SIB to the lumpectomy cavity is achievable via IMRT, but the consistent reproducible accuracy may be unobtainable even with IGRT due to the inter-fraction variations of the breast setup as well as the shape and size changes of the lumpectomy site. We therefore chose to focus our study on the inter-fraction movement of the breast tissue versus the lumpectomy site, and the benefits of a daily IRRT technique to improve the quality of IMRT-SIB breast irradiation.
Material and Methods: Two CT data sets each were obtained from 30 breast cancer patients. The first CT images were obtained prior to treatment and the second CT set was taken 4 weeks after the onset of radiation to reflect high levels of anatomical changes that may occur during the course of treatment. The IMRT plan with SIB delivers a daily dose of 1.8 Gy to the whole breast and 2.25 Gy to the lumpectomy site simultaneously. These plans were then copied onto the second CT data set and recalculated to mimic three different situations; (1) traditional setup using external marks, (2) setup using IGRT, and (3) the creation of a new IMRT plan using a re-planning computer program (IRRT) achievable by means of an in-room CT-on-rails.
Results: 20% of the cases showed significant dose degradation when mimicking a traditional setup with the targets' D95 falling below 95% and 50% of those cases had D95 falling below 90%. Implementing IGRT improved the lumpectomy site dose coverage, but consequently worsened coverage of the breast tissue and in 33% of those instances increased doses to the heart and lungs. The IRRT method was always able to improve dose coverage to the targets while maintaining all aspects of the original plan. Detailed results will be presented.
Conclusion: While IMRT is necessary to attain the SIB technique for breast treatment, dose coverage may not be consistently reproduced inter-fractionally. Also, IGRT alone was not able to correct for these dose variations and during instances of significant setup corrections due to anatomical changes, the plan delivered higher doses to critical structures. Furthermore, IRRT was the only solution that consistently reproduced the intended results of the initial IMRT plan. Our study has significant implications for hypo-fractionation radiation therapy that treat multiple targets concurrently.

2023 POSTER

Can Radiation-Induced Chronic-Oxidative Stress in Kidney and Liver Be Prevented by Dimethyl Sulfoxide? Biochemical Determination by Serum and Tissue Markers

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Background: The purpose of this study was to investigate the protective effects of DMSO on chronic oxidative stress in the liver, kidney, and serum with biochemical parameters such as malondialdehyde (MDA), advanced oxidation protein product (AOPP), catalase, glutathione (GSH), free-thiols (F-SH).
Material and Methods: Thirty Wistar-Albino female rats were randomly divided into three groups. Group I (control, n = 10), Group II (irradiation alone group, n = 10), Group III (DMSO and irradiation group, n = 10). Rats in groups II and III were irradiated with a single dose of 6 Gy to entire liver and right kidney. Group III received DMSO 4.5 g/kg by intraperitoneal injection 30 minutes before the irradiation. At the end of 24th week, the rats were sacrificed and their trunk blood and kidney, liver tissues were collected.
Results: Rats in group II showed increased levels of lipid peroxidation and protein oxidation, GSH, F-SH and catalase were significantly lower in liver, kidney, and serum than controls (Table 1).
Conclusion: DMSO is protector on chronic oxidative stress in the serum and kidney tissue.

Table 1. Serum, kidney, and liver tissue levels of oxidative and antioxidative parameters in each group

	Group I Control	Group II Irradiation-only	Group III DMSO + RT	*p* value	
				Gr.	value
Serum levels					
Malondialdehyde (MDA)Dagger;Dagger;	7.8 (4.38–8.34)	9.68(8.1–10.4)	6(4.6−6.3)	I-II II-III I-III	0.002**# 0.018**# 0.720**
Advanced oxidation protein product (AOPP)Dagger;	257.7±17	356±26	290.2±40.2	I-II II-III I-III	0.000*# 0.001*# 0.482*
Glutathione (GSH)Dagger;Dagger;	2.3(1.2−2.4)	1.2(1−1.5)	2.9(2.7−3.1)	I-II II-III I-III	0.001**# 0.000**# 0.000**#
Free-thiols (F-SH)Dagger;	36.9±2.3	37.5±2.4	47.7±2.6	I-II II-III I-III	1.000* 0.000*# 0.000*#
CatalaseDagger;	7674±3250	1655±277	5927.7±1196	I-II II-III I-III	0.004*# 0.012*# 0.573*
Kidney tissue					
Malondialdehyde (MDA)Dagger;	3.5±0.25	4.1±0.62	3.1±0.5	I-II II-III I-III	0.013**# 0.007**# 0.637**
Advanced oxidation protein product (AOPP)Dagger;	16±3.7	40.2±2.8	26.8±3.1	I-II II-III I-III	0.000*# 0.000*# 0.000*#
Glutathione (GSH)Dagger;Dagger;	12.9±0.6	8±1.2	10.8±2.5	I-II II-III I-III	0.000***# 0.006***# 0.000***#
Free-thiols (F-SH)Dagger;	23.3 (21.7–24.1)	15.2 (13.9–19.5)	18.3 (18.1–22.6)	I-II II-III I-III	0.000**# 0.001** 0.101**
CatalaseDagger;	41.2±6.3	33.2±6	31±2.7	I-II II-III I-III	0.002*# 1.00* 0.000*#
Liver tissue					
Catalase	89±21.3	71±11.4	69.5±5.9	I-II II-III I-III	.042 0.946 0.027
Malondialdehyde (MDA)	1.8±0.31	2.5±0.6	2.9±0.5	I-II II-III I-III	0.002 0.086 0.000
Advanced oxidation protein product (AOPP)	21.6±7	30.7±6	27.4±7.1	I-II II-III I-III	0.053 0.444 1.00
Glutathione (GSH)	13.6±1.2	8.9±1.7	8.8±1.0	I-II II-III I-III	.000 0.203 0.001
Free-thiols (SH)	31±4.1	17.4±3.6	21.2±5.2	I-II II-III I-III	0.000 0.075 0.000

Dagger;Mean±SD since fits to normal distribution, Dagger;Dagger;Median (Min-Max) since does not fit to normal distribution, *ANOVA, Bonferroni t test, **ANOVA, Dunnett T3, ***Kruskal–Wallis H Analysis and Mann–Whitney U test, #<0.05.

2024 POSTER

An Approach to Verify Accurate 3D Quality Assurance for Radiotherapy Plans

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Background: The aim was to investigate the feasibility and accuracy of 3D quality assurance (QA) software in the daily workflow.
Materials and Methods: 30 cases with head & neck tumour (2010, Oct to 2011, Feb) were enrolled. Using Varian Eclipse version 8.6 treatment planning system, radiotherapy plans were generated for each case. According to individual condition, two radiotherapy techniques were applied (IMRT: 18 cases; RapidArc: 12 cases). All plans were delivered in Varian Trilogy accelerator. Based on the same plan, 2D and 3D QA techniques were applied sequentially to measure the plan twice. The device for 2D QA is MatriXX and the 3D QA is COMPASS, which are both produced by IBA Co. After measuring the plans, the γ values ($0<\gamma<1$) both for MatriXX and COMPASS were obtained. Additionally, due to 3D analysis system, the γ values for organs were obtained at COMPASS. Then the values for organs were compared to MatriXX values respectively.
Results: Among the γ values of organs such as eyes, parotid, brainstem and spinalcord, there was no significant difference to MatriXX value, with *p*