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A PROPOSAL TO USE GRIDS FOR "SKIN SPARING" IN ELECTRON BEAM RADIOTHERAPY

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In the first half of this century, when only x ray machines were available for teletherapy, the doses that could be delivered to tumours were restricted because of skin tolerance. To overcome this problem "grid therapy" was used - the radiation was delivered through a lead sheet perforated with a grid of holes. The tolerance of skin to radiation was increased due to the fact that every small area of skin exposed to radiation was surrounded by nonirradiated skin,enabling biological repair processes which make the exposed skin resistant to radiation damage. We suggest the use of somewhat similar grids in electron beam therapy. Fortunately electrons are easily absorbed by heavy metals and therefore the grids used can be of low thickness.For the proposed electron grid therapy to be successful,the range of nonhomogeneous dose must be limited to a depth of up to about 1 cm.; the target volume must receive a homogeneous dose. We expected that due to the scattering of electrons when they interact with tissue one could get,with properly designed grids,homogeneous dose at such a depth. Our preliminary experiments - which will be presented and discussed - indicate that this is the case.

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ASSESSING RADIATION-INDUCED LUNG INJURY: WHOLE VERSUS PARTIAL ORGAN ENDPOINTS.

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Background: While radiation-induced lung injury is very common following thoracic irradiation, there is no consensus as to the best way of assessing the degree of injury.
Methods: Fifteen patients receiving therapeutic thoracic irradiation had pre- and post-therapy evaluations of both whole lung function using standard pulmonary function tests and regional lung function using 3-dimensional single photon emission computed tomography perfusion scans.
Results: A reduction in regional lung function was observed in 87% (13/15) of patients. Regional injury was often not associated with a reduction in whole lung pulmonary function tests (FEV-1, FVC, etc.). When whole lung asessments did drop, the diffusion capacity was most often affected.
Conclusions: There is often a disparity between the degree of lung injury, as assessed by changes in regional perfusion versus whole organ function. Compensatory changes in function within unirradiated regions may account for some of this discrepancy. Standard pulmonary function tests are generally not adequate to fully assess radiation-induced lung injury. Of whole organ assessments available, diffusion capacity appears to be the most sensitive.

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GRANISETRON AS PROPHYLAXIS IN THE CONTROL OF NAUSEA AND VOMITING IN PATIENTS UNDERGOING HEMIBODY IRRADIATION

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The efficacy and safety of iv granisetron (G) (3mg od) was compared in a single blind study to metoclopramide (M)(20mg) plus dexamethasone (D) (12mg) in the control of nausea and vomiting in patients undergoing upper hemibody irradiation (UHBI) or lower hemibody irradiation (LHBI). A total of 35 patients (28 men, 7 women) were randomised to receive either G or M+D 30 minutes prior to radiotherapy. G was administered to 23 patients (14 UHBI, 9LHBI) and M+D to 12 patients (6UHBI, 6LHBI).

Results

	Granisetron		Metoclopramide + Dexamethasone	
	UHBI	LHBI	UHBI	LHBI
	n (%)	n (%)	n (%)	n (%)
No nausea	4 (28.6)	4 (44.5)	0 (0.0)	2 (33.3)
No vomiting	10 (71.4)	7 (77.8)	0 (0.0)	0 (0.0)

Only one adverse experience was recorded; a single patient in the G group with mild headache. No corrective therapy was required.

In conclusion, granisetron was more effective in the control of nausea and vomiting than M+D induced by both UHBI and LHBI.

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A SMALL CHANGE IN A RADIATION TOLERANCE LIMIT CAN PRODUCE A LARGE CHANGE IN TUMOR DOSE

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Dose and volume tolerance limits in radiation therapy are uncertain. We asked whether the dose given to an abdominal tumor could be substantially raised if a tolerance limit was slightly relaxed. A plan for an abdominal tumor surrounded by bowel, liver, kidneys, and cord was prepared. Limits were placed on the amount of each organ which could receive more than a critical dose. The largest possible tumor dose was then found using a mixed integer program. If the fraction of liver volume allowed greater than 30 Gy was increased from 30% to 40%, the minimum tumor dose could be raised from 50 Gy to 57 Gy. The results show the effect on tumor dose of uncertainty in a tolerance limit. Varying a limit within its range of uncertainty may force a large non-linear effect on the tumor dose.

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EFFECTIVENESS OF BOOST DOSES GIVEN TO POOR RESPONDERS IN PTS WITH SQUAMOUS CELL CARCINOMA OF THE GLOTTIS TREATED Co-60.

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Several radiotherapists are giving boosts in case of only partial remission of tumour at the end of treatment.The similar policy was adapted in our Dpt.Tumour-response was evaluated during the treatment course and larger doses were given to poorly responding pts.The aim of study is to check whather the boost doses are beneficial to pts. We analyzed 105 consecutive pts with squamous cell carcinoma of the glottis treated radicaly with Co-60 in 1984--1990.The follow up informations were obtained in 95% of pts.The shortest follow up period was 2 years.The pts were treated by the same team of doctors using the same protocol.The tumour dose was specified using computer and most commonly was equal to 90% of max.isodose line. All pts were treated with continous-course of irradiation using once-a-day fractionation.The regression of the tumour was checked during the treatment in one week intervals.
Conclusion: the boost dose given to poorly responding pts did not improve the results.
Key-words: Radiotherapy, glottic cancer, boost dose

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VASTUS LATERALIS MUSCLE TRANSPOSITION IN MAJOR PERINEAL SOFT TISUUE DEFECTS.

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Primary high-dose Radiotherapy, or RTX following extensive surgery for either primary or recurrent gynaecological or rectal malignancies may result in non-healing, inert, painful, major perineal soft tissue defects. Reconstruction of such defects often requires more voluminous subtitutes than thusfar available. Seven patients, 3 with recurrent tumor of the vagina and/or rectum, and 4 with extensive deep sited radionecrosis following initially curative RTX, had wide radical perineal excisons. To repair the defect, a new muscle transposition technique was applied. The Vastus lateralis muscle (VLM) was dissected and freed from the minor trochanter. Rotation on its vascular pedicle (descending branch of the circumflex femoral artery) provided ample mobility to bring the muscle in the lesser pelvis. In 6 pts the procedure proved successful. Healing was accomplished within 2-3 weeks with adequate relief of symptoms. In one frail female pt (78 yrs), in poor clinical condition, total flapnecrosis occurred. Though not a simple technic, VLM transposition proves effective in the repair of large volume requiring perineal defects.