preoperative irradiation and chemo-irradiation on the healing of colonic anastomoses.

Methods: 92 male Wistar rats were divided into four groups; a control (I, n = 20), a sham irradiated (II, n = 20), irradiation (III, n = 32), which received fractionated irradiation to the pelvis to a total dose of 22 Gy, 5 5 Gy per fraction in four consecutive days, and chemo-irradiation (IV, n = 20) which received irradiation plus intraperitoneal 5- Fluorouracil (5-FU, 20 mg/kg) for five consecutive days. All groups underwent left colonic segmental resection and primary anastomosis 3 to 4 days following therapy. Abdominal wound healing, anastomotic complications and anastomotic bursting pressure measurement were recorded.

Results: On the third and seventh days, the mean bursting pressures of anastomoses were determined; 36.5 mm Hg and 208 mm Hg in group I; 38.5 and 228 in group II; 25 and 150 in group III and 27 and 162 in group IV, respectively. ($p < 0.01$ for group III and IV). The burst occurred at the anastomoses in all animals tested on the third postoperative day; one in group I (10%), none in II, six in III (37.5%), and four in IV (40%) on the seventh postoperative day.

Conclusion: Preoperative fractionated irradiation and chemo-irradiation seem to delay the healing of colonic anastomoses in rat. Therefore, in order to prevent anastomotic complications, one may prefer to protect the anastomoses by diverting stoma.

473 PUBLICATION

Colorectal carcinoma – Intraoperative radiotherapy with Afterloading-Flab-Technique

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The intraoperative radiotherapy (IORT) is a new concept in the treatment of colorectal tumours.

Between 10/94 and 12/96 22 patients (adjuvant 8, palliative 14) received IORT. Chemo- and percutan radiotherapy was already applied at all patients with advanced and recurrent colorectal tumours. The intraoperative irradiation was performed through HRD-Iridium-Afterloading. A flexible flab – individually adapted to the "tumorbed" – was used as applicator. The contact-dose was 10 Gy.

The mean operation time (rectumresection 2/rectum amputation 13/debulking 7) increased 30 minutes at average. 4 patients had postoperative complications – possibly correlated to irradiation – in form of perianal wound problems (2) and sacrovesical fistulas (2). Up today – in average 10 months (2–21) after operation – 16 patients are tumour-recurrence free. Four patients have a local tumour progression combined with good quality of life. Only 2 patients died (marasmus; acute kidney failure).

With the Afterloading-Flab-Technique a technical simple, little harmful procedure is disposable in the therapy of colorectal tumour. Even when IORT through electronic radiation is not possible or the patients are already treated with rays, a higher irradiation dose is applicable. Obtaining a low rate of local tumour recurrence the Afterloading-Flab-Technique is a valuable treatment alternative to extended, high risk resection procedures.

474 PUBLICATION

Clips and scar as the guidelines for breast radiation boost after lumpectomy

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Purpose: Evaluate the accuracy of external irradiation boost design, based either on the metallic clips in the tumour bed, or on the skin scar after lumpectomy.

Methods: Thirty one consecutive patient were investigated. Metallic clips were put by surgeon during lumpectomy, marking the length, width and depth of tumour bed (TB). Electron beam external radiation boost fields were simulated both by surgical clips and by scar for each patient. Two cm have been taken in every direction of the clips. When the field has been planned by scar, 2 cm were added to the length of the scar in both directions, the width of the field was planned adding 2 cm in each of 2 directions to the maximal diameter of removed tumour. Fields area, boost volume, fields overlap were calculated and compared.

Results: The volume of tumour bed and the area of the radiation fields, designed on the basis of scar (VS and AS), were 1.48 time larger, than the corresponding fields and tumour bed volumes, defined by the clips (AC and VC), ($p < 0.001$). Only 74% of AC were covered also by AS, leaving 26% of AC outside the field, designed on the basis of the scar. While AC included all the clips, AS covered only 88% of the clips, delineating TB ($p < 0.05$) On the average, 1/4 of the TB can be left untreated by the field built considering the surgical scar to be reliable landmark for the boost. On the other hand, 41% of SA was not covered by CA, which meant that while treating according to scar, about 40% of the field area could be irradiated unnecessarily.

Conclusion: Surgical scar is unreliable landmark for the planning of radiation tumour bed boost after breast conserving surgery. It can miss considerable part of tumour bed, compromising local control rate. On the other hand, even larger portion of scar oriented boost can be irradiated unnecessarily, thus compromising the cosmetic results, which are the main goal of breast conserving treatment.

475 PUBLICATION

Radiation therapy for chemodectoma of the head and neck region; long term results

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Chemodectoma is rare neoplasm arising from non-chromaffin cells of chemoreceptors. Most frequently chemodectoma is localised in the head and neck region, especially in the temporal bone region and carotid body. Treatment of choice in early stages of chemodectoma is surgery. The aim of this paper is estimation of the effectiveness and tolerance of radiotherapy for locally advanced head and neck chemodectoma.

TEMPORAL BONE REGION: Between 1970 and 1990 thirteen patients with temporal bone region chemodectoma were treated with radiotherapy in Cancer Center in Warsaw. All patients had advanced disease with bone involvement and/or cranial nerves injuries. Patients were treated with Co-60 rays and two wedged fields technic was used in all cases. Total dose ranged from 45 to 65Gy. Response was obtained in 12/13 pts.

During observation only patient died from chemodectoma progression. Treatment was well tolerated and we didn't observe any serious late complications.

CAROTID BODY: Between 1974 and 1990 six patients with locally advanced carotid body tumor (diameter more than 5 cm) were treated with radiotherapy in our center. Co-60 rays and opposite fields technic were used in all cases. Total dose ranged from 45 to 60Gy. Complete regression was obtained in 3 patients and partial regression in 3 other cases. During observation (more than 5 years) we haven't noted progression in any case. Also we didn't observe any serious late complications after treatment.

Conclusions: Our results confirmed data of other authors suggested that radiotherapy is effective treatment for temporal bone region chemodectoma. Radiotherapy is also effective treatment for carotid body tumor. Tolerance of radiotherapy in both localisations is good.

476 PUBLICATION

Impact of anatomical variability on dose delivery by three field technique in adjuvant radiotherapy of breast cancer

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Purpose: To assess anatomic variability of the axilla relevant to adjuvant radiotherapy of breast cancer and interaction between treatment fields on dose distribution.

Methods: CT based treatment planning records of breast cancer patients treated post-operatively by 3-fields – anterior supraclavicular (SC), medial and lateral opposed tangential thoracic wall fields (TT) – from January 1994 to December 1995, are reviewed for availability of CT images through the SC-axilla region. Images, distances measurements are compared to simulation records and dose distributions are calculated.

Results: Mean axilla thickness measured on CT images from 43 retrieved cases is 14.5 cm ± 2.0 (standard deviation), it is closely correlated to simulation records of table height (Spearman correlation $r = 0.77$, $p < 0.0001$). With dose of 46 Gy by 6 MV photons calculated at fixed depth of 3 cm for the SC field, the mid-axillary dose ranges from 32 to 44 Gy. In individual patients, dose distribution from the anterior to the posterior axilla ranges from 116% to 55%. However total planning taking into account all 3 fields could not be done reliably due to difference of patient positioning to accommodate limited CT aperture.

Conclusion: Large dose inhomogeneity was expected. The problem of 3-D dose distribution of the non-coplanar SC and TT fields is relatively