

2. re-irradiation;
3. brachytherapy;
4. integration of radiotherapy with the other methods of palliative and symptomatic care.

31.

ENDOVASCULAR BRACHYTHERAPY

R. Pötter

32.

QUALITY ASSURANCE FOR NEW TECHNIQUES OF BRACHYTHERAPY

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In addition to classical HDR, PDR or LDR brachytherapy, new techniques such as transperineal radioactive implantations of the prostate via template guidance, or vascular brachytherapy for the prevention of restenosis, are becoming increasingly popular. At the same time they are introduced in a department, a quality assurance program must be implemented both to minimize the risks of treatment misadministrations and to prove respect to legal liability.

The authors try to point out the necessary equipments and the particularities of Q.A. programs which must cover all the steps of the treatment. They consider successively prostate and vascular brachytherapy, making for each of them, a quick review of the most current techniques (including associated accessories and imaging devices), showing the particularities of adapted computerized treatment planning systems and the characteristics of radioactive sources usually used (photon sources for prostate such as ^{192}Ir for temporary implants and ^{125}I and ^{103}Pd for permanent implants, ^{192}Ir or β sources for vessels). Particular detectors and methods to be employed to perform quality controls of equipments and sources, or in vivo measurements, are also presented. Lastly the guidelines and recommendations for "good practice and quality assurance" concerning these particular techniques and published by different international organizations, or which are in the process of development, are summarized. It will be noted that volume definitions, dose prescription and reporting, dose planning, dosimetry, staffing and responsibilities, etc, are or should be included in a complete quality assurance program.

33.

LAST RESULTS AND LESSONS OF THE ESTRO EUROPEAN NETWORK ON QUALITY ASSURANCE IN RADIOTHERAPY

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State of the Art: The EQUAL Dosimetry audit service, set-up by the ESTRO in 1998^a, is well-known through large numbers of TL-dosimeters sent to hospitals to be irradiated in clinically relevant conditions, and read at the EQUAL Measuring Laboratory, IGR, Villejuif.

All European countries have now applied to participate (404 centres out of 880) for photon and electron beams. In relation with the IAEA, this service has been extended to 27 centres of 7 countries from Eastern and Central Europe, and the Mediterranean Basin. 757 photon beams and 277 electron beams have been checked according to the "on the beam axis" procedure.

Results and outcome:

- Reference beam output results demonstrating improvements with respect to the former EC Network, and good reliability of the procedure : mean ratios of measured to stated dose of 0.997 (SD 1.8%) for photon beams, and 1.003 (SD 2.1%) for electron beams.
- Useful service detecting 7% of the photon beams presenting at least one check point with a deviation > 5% (2% for electron beams, but 3 times more deviations between 3 and 5%).
- Re-checks and on-site visits in 8 centres reveal inaccuracies in TPS algorithms or input data and/or in local measurements (wedge factors, collimator aperture factors, PDD's, beams calibrations).

Conclusion: A number of dosimetric problems are still observed, even on the beam axis. Improvements should be introduced and checked before considering more sophisticated treatment techniques.

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