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A NEW ERA IN RADIOTHERAPY

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The search for new radiation treatment techniques to improve local tumor control continues to represent a major challenge in the management of localized human cancer. Before CT scans became available for planning radiation treatments, tumor target volumes and the boundaries between tumor and normal organs were poorly defined. To reduce the risk of local relapse, radiation target volumes classically included a wide "safety" margin of surrounding normal tissue. Restrictions imposed by normal tissue tolerance often limited the radiation doses administered to less than optimal levels. CT-assisted treatment planning improved the ability to define tumor target volumes for radiotherapy. However, the limitations imposed by computer technology have confined the use of CT information in conventional 2D treatment planning to one or at most a few CT slices at or near the central axis of the radiation beam, whereas treatment planning at levels beyond the central axis is not based on detailed CT anatomical information.

The introduction of three-dimensional conformal radiation therapy (3D-CRT) has heralded a new era in radiotherapy. Sophisticated computer-aided techniques are used to plan and deliver prescribed radiation doses, conforming the desired dose distribution to the entire 3D configuration of the tumor. The use of 3D imaging technology for treatment planning has reduced the risk of underdosing parts of the tumor. In addition, the effective exclusion of normal tissues from the volume carried to high radiation dose levels has allowed an escalation in tumor dose to levels beyond those feasible with conventional 2D radiotherapy. The aim is to improve local tumor control, as failure to control the primary tumors is associated with increased rates of both metastatic disease and mortality.

Because of the increasing complexity of 3D treatment planning and the need to evaluate large numbers of competing plans, a critical development for realizing the full potential of 3D-CRT is the introduction of computer-aided optimization of treatment planning. In addition, the extraordinary increase in the complexity of treatment delivery requires the introduction of immobilization devices, computer-controlled treatment delivery machines with automated multileaf collimators for beam shaping, on-line verification systems with a potential for feedback control loops to automatically correct set-up errors during treatment, and patient safety devices. Dosimetric methods are being developed to compensate for the inaccuracy in 3D treatment caused by organ motion. Many of these components have been implemented at the Memorial Sloan-Kettering Cancer Center.

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MINIMAL ACCESS SURGERY IN THORACIC ONCOLOGY

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Minimal access surgery—primarily in the field of laparoscopic cholecystectomy—has rapidly become spread worldwide and is already one of the fundamental components of the surgical arsenal. Its dissemination in surgical oncology has been much slower, which especially refers to thoracic oncology.

Based on his own experience and literature data the author outlines the indications of the so-called video-assisted thoracic surgery (VATS), the advantages, disadvantages and results of the method in the field of intrathoracic tumours. Although the development of this method is hard to predict as yet, in the author's opinion in-depth and careful investigations are needed for the precise assessment of its value. The author suggests that VATS will probably not occupy such a role in thoracic surgical oncology as it already fulfils in general surgery.

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LAPAROSCOPY AND LAPAROSCOPIC ULTRASONOGRAPHY IN THE ASSESSMENT OF UPPER GASTROINTESTINAL CANCER

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Imaging of abdominal organs has greatly improved with the introduction of ultrasonography and computed tomography. Despite the advantages these techniques offer, the surgeon dealing with gastrointestinal malignancies is often faced with a wide discrepancy between pre and peroperative staging. Laparoscopy performed before a planned laparotomy

will exclude these metastases. As a result of this more accurate staging an unnecessary laparotomy may be avoided. For less obvious hepatic and pancreatic lesions, it is now possible to perform a laparoscopic ultrasonography introducing transducers of either 5 or 7.5 Megahertz through cannulas of 15 or 10 mm. This technique has been used in the preoperative assessment of 93 patients with "curable" gastrointestinal tumors.

Results: Using laparoscopy and laparoscopic ultrasonography we obtained important information which included a change in the planned preoperative surgical treatment in 44 of the 93 patients (48%). This information was obtained by: (a) visualisation of liver or peritoneal metastases by laparoscopy in 27 of the 44 patients, (b) the use of ultrasonography for the study of less obvious liver lesions in another seven, and (c) by the combination of data obtained by visualisation and ultrasonography in another ten patients.

Conclusion: Laparoscopy and laparoscopic ultrasonography is a reliable technique in the assessment of patients with upper gastro-intestinal cancer. The combination of visualisation of the whole abdominal cavity and ultrasonography for less obvious liver lesions included a change in the planned preoperative surgical treatment in almost half of the patients. This change implies avoidance of an unnecessary laparotomy permitting a more adequate and less invasive palliative treatment.

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MINIMAL ACCESS SURGERY IN ONCOLOGY

D. Dargent

The gynaecologists were the first to use minimal access surgery. This kind of surgery was, during years, limited to benign conditions. We were the first, in December 86, to use it in the management of cancer while performing a laparoscopic assessment of the pelvic lymph nodes for a woman affected by an infiltrative cervical cancer. We have now an experience of more than 400 cases. Pretherapeutic assessment of the retroperitoneal lymph nodes remains the best of the good indications of laparoscopy in the field of gynecologic oncology.

Laparoscopy enables us to assess either the pelvic or the aortic retroperitoneal lymph nodes, using either the direct retroperitoneal approach or the transumbilical transperitoneal one. Many data clearly established that such an assessment is as reliable as the classical surgical assessment, while avoiding all the drawbacks of the open surgery. Knowledge of the lymphnodal status enables us to take at the good time (before radical surgery or radiotherapy) the good decision: in the good cases (no risk factor, no lymphnodal involvement) the treatment can be exclusively surgical and the surgery can be performed using the vaginal route; in the bad cases (risk factors and/or lymphnodal involvement) the treatment has to be multimodal using combinations (chemotherapy, radiotherapy, surgery) whose choice depends on the extent of the disease as it has been defined by the laparoscopy.

The chosen example is representative regarding the role of minimal access surgery in oncology. The laparoscopic debulking surgery has been advocated by some surgeons in thoracic, abdominal and pelvic surgery. This practice appears as hazardous except, maybe, in the frame of neoadjuvant chemotherapy protocols during which a laparoscopic debulking of the residual masses can be undertaken. However the actual place of laparoscopic surgery is not here. Laparoscopy's first role is selecting the cases for an appropriate treatment.

Minimal access surgery is a cost effective tool to use in order to improve the cost effectiveness of the treatment of pelvic, abdominal and thoracic cancer.

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MINIMAL ACCESS SURGERY IN UROLOGIC-ONCOLOGY—NEW AND APPROVED TECHNIQUES

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Minimal access surgery in urologic oncology has along tradition: organ preserving transurethral resection or laser ablation of bladder tumors and transurethral resection of prostate carcinoma eventually combined with laser therapy. Endoscopic techniques are used to treat urothelial tumors of the upper urinary tract. To these approved techniques minimal invasive laparoscopic lymphnode extirpation in cases of prostatic and bladder cancer have been added just as laparoscopic nephrectomy in cases of small renal cell carcinomas or transitional cell carcinomas of the upper urinary tract. New techniques like laser irradiation of the whole bladder in case of transitional cell carcinomas have been perfected. Even