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Guest editor's introduction: state-of-the-art and current developments in local tumor therapy

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Over the last 20 years image-guided tumor therapy experienced a dramatic development. This development is ruled by two facts: (1) continuously improved imaging with respect to tumor detection, therapy monitoring and guidance, as well as post therapy follow-up; and (2) significant advances in the usability and efficacy of minimal-invasive therapeutical techniques and devices.

Robust, high resolution and high contrast imaging by ultrasound, computed tomography and magnetic resonance tomography together with the use of contrast agents for the respective imaging modalities is the crucial component of detecting, characterizing, staging, and follow-up in most tumors. Moreover, rapid real-time imaging by ultrasound, projection radiography, CT, and even MRI allow online guidance for the placement of minimal-invasive therapy devices as well as monitoring instant local therapeutic effects.

With respect to general oncological and surgical conditions, surgery is the method of choice in the therapy of most tumors. However, overall only 15–30% of patients with malignancies are suitable for a primary surgical therapy with curative intention. Therefore, modern chemotherapies including the wide use of biologicals are considered to be the main columns in adjuvant and neoadjuvant treatment regimens—taking into account that there will be no long-term curative effect in most of the cases. Based on the positive data of surgical resection in patients with limited tumor load and the resulting long-term survival, the concept of local ablative therapy—with and without concomitant chemotherapy—evolved for cases where a surgical treatment is not possible anymore due to medical and/or technical reasons.

In general, four basically different ablative local therapy methods can be differentiated:

- local, percutaneous instillation (i.e. percutaneous ethanol instillation, instillation of acetic acid),
- transarterial embolization (i.e. trans-arterial chemoembolization and bland embolization),
- percutaneous thermal ablation therapy (i.e. radiofrequency ablation, laser ablation, microwave ablation, cryoablation, and focused ultrasound),
- selective radiotherapy (i.e. selective internal radiotherapy, interstitial brachytherapy, and percutaneous high precision radiotherapy).

The local tumor situation (e.g. vascularization, localization, size, delineation, and identifiability etc.) determines the appropriate use of these various techniques, which often can be combined with classic surgery and chemotherapy (multi-modality concept).

In this Feature Section of Abdominal Imaging, several well known experts in the field discuss state-of-the-art imaging and minimal-invasive, interventional therapies in primary and secondary liver tumors:

- Peri-intraprocedural imaging: US, CT, and MRI,

- The current role of minimally invasive therapies in the management of liver tumors,
- Current treatment concepts in HCC,
- Arterial therapies of colorectal cancer metastases to the liver, and
- Arterial therapies of noncolorectal cancer metastases to the liver.

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