Loco-regional Chemotherapy and Chemothrombolisation

Over the last two decades, intensive research was conducted in improvement of oncologic patients with progressed stages of disease. Various combinations, like two or three chemotherapy agents with and without radiation and with or without surgery and LITH, were tested in large clinical trials, and some of these combinations found their way into the current general ("first line") therapy of metastatic disease.

The systemic (intravenous) application of combination chemotherapy usually provokes major toxicities in the patient, who is always already in a condition with decreased health and suppression of the immune system. To decrease damage to the veins, port systems in the subclavian vein are implanted.

In order to obtain an effective dose of a chemotherapy agent, the doctor must administer a large dose. The reason being, that the administered amount of chemotherapy will first be diluted in six to seven litres of blood before it will end up in the tumor. Therefore, to apply a concentration, large enough to have an adequate effect on tumor tissue, the oncologist must administer a much higher dose of chemotherapy than when he could administer the chemotherapy in one target organ or one target organ system.

In the loco-regional chemotherapy, a very thin catheter is inserted into the artery which supplies the tumor (metastases). Usually, the catheter is inserted into the femoral artery in the groin. Thus, through the catheter, a much higher concentration of chemotherapy in the target tumor tissue is achieved than ever possible by systemic (intravenous) administration but with much less systemic toxicities (side effects).

Insertion of intra-arterial catheters is at very low risk for the patient and the advantages are obvious and well-documented by many cancer research centers.

A main indication for loco-regional chemotherapy is in more advanced forms of cancer where multiple lesions are present. In this way, the patient can be treated very well with little to no (systemic) side effects and with a maximum chance of efficacy.

A second indication of loco-regional chemotherapy is "debulking," or decreasing tumor load, so that a patient can still be operated surgically and increase life expectancy and quality of life. A very good example is a patient with colon carcinoma. In about 90% of all patients who have been diagnosed with colon carcinoma, have already multiple liver metastases and an inoperable primary tumor (Gazzangia 1995). Life expectancy is then four till six months at

best. If there are only a few metastases in one liver segment, in certain cases, when enough healthy liver tissue can be saved, patients can undergo resection of the part of the liver. This surgical procedure is often not possible any more and also, not without risks but can add twelve to thirty-six months to the patient's life expectancy (Lygidakis 1996/1997/1998, Germari 1992, Bhattacharya 1994, Ziren 1994).

In case an operation is not possible, successful loco-regional chemotherapy in combination with immune restoration can add at least twelve to thirty-six months to a patient's life expectancy (Okuno 1995, Lygidakis 1995/1996, Kemeny 1992, Salman 2002). Therefore, more and more oncologists prefer to offer cancer patients loco-regional chemotherapy in combination with immune restoration.

At the Medical Center Cologne, as part of the Cologne Model, patients with metastatic disease are evaluated and often offered some form of loco-regional chemotherapy and immune restoration (Voigt 2002). Among the doctors in the Medical Center Cologne, applying this form of chemotherapy, there is an almost decade-long experience with the application of loco-regional chemotherapy.

To improve the efficacy of the loco-regional chemotherapy, in the Cologne Model, at least four additional procedures are usually performed:

1) Testing the sensitivity of tumor cells for various chemotherapeutic agents. In many cases, the standard choice of a chemotherapeutic agent is not useful, as tumor cells exhibit little to no sensitivity for that specific agent. In that case, a patient would have been treated with a chemotherapeutic agent, which would not have had the desirable effect but would still have caused side effects with immunosuppression. Often, isolating tumor cells from the peripheral blood stream provides enough tumor cells to conduct these sensitivity test;
2) Adding loco-regional hyperthermia and "fever-range, total-body hyperthermia" and vaccinations with autologous monocyte-derived dendritic cells;
3) Application of New Castle Disease Virus (through inhalation and parenteral applications);
4) Orthomolecular Medicine;
5) Nutritional support.

Loco-regional chemotherapy can be combined with embolisation of the arteries which supply the tumor with blood. Thus, blood flow to the tumor is blocked and the tumor is deprived from blood supply, usually resulting in tumor death (necrosis).

Also, hyperthermia and chemo-embolisation can make tumor cells much more sensitive for chemotherapy (Wallace 1990).

In general, all solid tumors (like breast cancer, colon cancer, prostate cancer, lung cancer, gastric cancer and so on) can be successfully treated with loco-regional chemotherapy and by chemo-embolisation.