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Klinisch-pathologischer Charakteristika strahleninduzierter Sarkome

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During 2001 until 2004 a data collection of 201 patients with Radiation Induced Sarcoma (RIS) was performed. 80 tissue samples of RIS were histologically re-evaluated by two pathologists of the EORTC Soft Tissue and bone Sarcoma Group. Primary diseases and the reason for prior irradiation were breast cancer (21%), Hodgkin's lymphoma (13%) and tumors of the gynaecological area (18%). The data showed a distribution of histological subtypes of RIS with a predominance of NOS Sarcoma (32%), OST (21%), LMS (20%), MPNST (9%) and ANG (9%). Most RIS were high-grade and presented clinically symptomatic at the time of diagnosis. 4% of RIS were evaluated as grade 1, 24% as grade 2 and 73% as grade 3. Median duration of tumor control of grade 2 and 3 was nearly equal with 10 months and 8 months, respectively. Median duration of tumor control of grade 1 tumors was markedly longer with 43 months. We could not demonstrate a significant survival difference for RIS subtypes due to small case numbers.

The latency period between irradiation and detection of RIS ranged from 10 months to 40 years with an overall median of 180 months. A dose-dependency of RIS occurrence could not be determined. The prior irradiation contained mainly Cobalt (in 22%) and a median dose range between 44 and 60 Gy.

We reviewed the relation between surgical resection margins and duration of tumor control. 95% of all patients underwent surgery with 52% R0 resection, 20% R1 resection and 11% R2 resection. The median survival was calculated as 11 months in patients with R0 resection, 10 months in R1 and 14 months in R2, which was not significantly different. Furthermore, no correlation between metastatic rate and resection margin status could be verified.

44% patients had developed distant metastases with 67% of them showing lung metastases, 15% multiple metastases in addition to lung and 18% of single areas of metastases outside the lung.

The median overall duration of tumor control was 12 months (range 7 days – 240 months). Regarding treatment of RIS we compared different combined treatment approaches for RIS, as surgery in combination with chemotherapy and / or irradiation. In patients who received triple therapy, the median duration of tumor control was 13 months, whereas surgery alone led to a tumor control in median of 12 months. Chemotherapy plus surgery or surgery plus irradiation were both able to control tumor growth in those patient groups for 10 months apiece. In patients treated with single chemotherapy treatment, the median duration of tumor control was 9 months.

A Kaplan-Meier survival analysis demonstrated significant differences in survival time of surgery vs. surgery plus chemotherapy with a median survival of 7 months vs. 17 months respectively ($p=.024$).

In conclusion, RIS is a rare and not well characterized disease with a rather poor prognosis. The outcome remained poor despite adequate surgical treatment. A Kaplan-Meier analysis could demonstrate a slight survival benefit for patients treated with a combination of surgery and chemotherapy. Further prospective studies with a prospectively evaluated treatment algorithm are required to improve treatment outcome.