Analysis of Risk Factors of Local Recurrence in Soft Tissue Sarcomas of the Limbs: Review of the Literature

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Soft tissue sarcomas (STS) are rare neoplasms (1% of all cancers in US with a prevalence of 10520 new cases/year) [1,2], although there are more than 50 different histological types [3,4]. The current management of STS is addressed to excision of the tumor and to preserve limb function as better as possible; respecting this balance has been always a challenge for the orthopedic oncology and the importance of treating patients with such sarcomas with wide radical resections obtaining negative pathological margins has been underlined in many studies [5-14]. Amputation represented gold standard for many years; but in the last 20 years, obviously thanks to new diagnostic technique and to new adjuvant radio and chemotherapy, limb salvage became first choice.

It's widely acknowledged that local treatment of primary soft-tissue sarcoma of the limbs influences the likelihood of local recurrence, limb salvage, and functional outcome, while the metastatic potential is mainly determined by the grade and size of the primary tumor [4]. It's absolutely established that Local Recurrences (LR) in STS represents a failure of tumor local treatment because often are related to tumor progression (many authors support the idea that local recurrence increases the likelihood of metastatic spread, although debate on this point continues [5-8] and because LR leads to a necessary secondary surgery with high risk of amputations.

While the grade, the depth, the size and the local recurrence of the tumors are well accepted like predictor factors for the development of distant metastasis [5,15-20], it was always harder to finds a relationship between LR and precise predicting factors. In the last thirty years many papers tried to focus risk factors of LR and many factors are nowadays accepted but there is no general agreement on different variability and prevalence of these.

More important risk factors of local recurrences in soft tissue sarcomas considered by authors in literature:

Resection margins: Positive or not adequate surgical margins were demonstrated to be adverse prognostic factors for the local recurrences by multivariate analysis in different studies [15-17]; adequate surgical margin are the strongest predictor for local recurrence.

Histologic grade: High-grade sarcomas had a 4.8 fold increase in the risk of death and local recurrences compared with low-grade sarcomas and that mitotic activity (as determined by the mean number of mitoses per 10 high power fields) could be used as an additional prognostic factor [21].

Histological subtypes: In addition to the assessment of grade and mitotic activity, the histologic subtype of sarcoma was found to be an important prognostic factor. The histologic diagnosis of angiosarcoma, synovial sarcoma, or Ewing's sarcoma carried with it a 13-fold increased risk of death compared with liposarcoma, fibrosarcoma, and malignant peripheral nerve sheath histologic types [21].

Recurrence at presentation: Locally recurrent sarcomas were found to have a 7.4-fold greater risk of local recurrence compared with primary sarcomas on presentation. The local recurrence-free rate was reported to be 89 ± 5% if patients presented with local recurrence only. Patients with microscopically positive margins on definitive surgical resection had a 2.4-fold greater risk of local recurrence than did those who had clean margins on surgical resection [5,18,21-23].

Microscopic tumor necrosis, mitotic rate, DNA ploidy [24], perioperative blood transfusions [25] and unplanned initial excision [26] were also considered prognostic factors of local recurrence by some authors, but big controversial are still present.

What is clear is how surgery plays the main role in the local control and disease control of soft tissue sarcoma of the limbs and that new study with huge series for each different histological subtype would be very helpful to define the best protocols of treatment.

References

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