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## Less Radical Resection for Soft Tissue Sarcomas Combined with Chemotherapy and Acridine Orange Photodynamic Therapy Produced Excellent Local Control

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### Background:

A wide resection is an effective method to inhibit local recurrence and poor prognosis for soft tissue sarcoma (STS). But if tumors are in close to major nerves, vessels, it's sometimes difficult to resect with wide margin. We established a new surgical therapy as acridine orange(AO) therapy which is supported by photodynamic surgery(PDS) and radiodynamic treatment(RDT) to reduce the surgical margin. We performed AO therapy(AOT) to STS patients, and analyzed the clinical outcome of AOT.

### Methods:

69 high-grade STS patients were treated with AOT. We selected the patients for AOT by following criteria; 1) Tumors contacted with major nerve, vessels or joint; 2) MRI showed less invasiveness to normal tissues. Procedure of AOT is that; 1) less radical resection (marginal or intralesional resection) is performed; 2) additional microscopic curettage with ultrasonic knife under tumor visualization with green fluorescence is performed(AO-PDS); 3) after closure of surgical wound, 5Gy of X-ray is immediately irradiated(AO-RDT).

### Results:

The details were shown in Table 1. 10-year overall survival(OS) and local recurrence free survival(LRFS) was 64%vs.68%. The average of ISOLS/MSTS limb function score was 93%, which indicates excellent limb function. In univariate-analysis, the following parameters influenced the OS: tumor size>5cm (Hazard-Ratio (HR)=1.12) and AJCC IV(HR=24.2). The LRFS was influenced by tumor size>5cm(HR=1.12) and effectiveness to preoperative chemotherapy(P-chemo) (HR=5.45). Intralesional margin status wasn't influenced for OS and LRFS. 10-year LRFS with or without P-chemo was 80% and 57%. Of 35 P-chemo patients, 17 showed the good response, and 10-year OS and LRFS of P-chemo responders were 91% and 92%. The factor of P-chemo response influenced the OS and LRFS significantly.

### Conclusion:

Although AOT has several limitations, AOT showed acceptable results in local control, prognosis, and limb function. Furthermore, the combination with effective P-chemo and AOT produced excellent results of OS and LRFS, even if the tumor resected with intralesional margin. All patients received AOT displayed excellent function, since AOT allows preservation of normal tissues. Based on the clinical outcome, we believe that AOT is useful for preserving excellent limb function with low risk of local recurrence, especially in chemo sensitive STS as rhabdomyosarcomas or synovial sarcomas.

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