Introduction

Sarcomas are a heterogeneous group of cancers that arise from mesoderm-derived elements, including bone, cartilage, connective tissue, fat and muscle. The soft tissues and bony structures constitute almost two thirds of the mass of the human body; despite this, sarcomas are not common. Still, a practicing surgeon can expect to encounter them at some point and must therefore be able to recognize them. Soft tissue sarcoma, which account for 75% of all sarcomas, are responsible for the deaths of more patients each year than testicular cancer, Hodgkin disease, and thyroid cancer combined. ***(Parker, 1996)***

The majority of STSs arise sporadically, with no obvious underlying association and/or cause. There are, however, several recognized predisposing genetic and environmental associations. The neurofibromatosis type I (NF I), for instance, results from a genetic mutation in chromosome 17q11 and can lead to the development of peripheral nerve sheath tumors, with a 2% risk of malignant change. ***(A.Misra, 2009)***

Soft tissue sarcomas may arise in any part of the body, predominantly in the extremities 45%; lower limb 29%; upper limb, trunk 25%, head and neck 13%, and retroperitoneum 8%. ***(Parker, 1996)***

The tumors are graded according to the French grading system, distinguishing low- , intermediate- and high –grade

STS, and staged according to the American joint committee on cancer staging system. ***(Brennan, 1999)***

The role of primary surgery as primary treatment and intervention in multidisciplinary sarcoma treatment is reviewed. The limb salvage surgery begins with preoperative assessment of the tumor using biopsy and radiography. After the assessment, the tumor is removed by a wide or radical surgical excision. This method has been the mainstay of the treatment for soft tissue sarcoma of the lower limb. This surgery often results in large soft tissue defects requiring either immediate or delayed soft tissue coverage. Reconstruction of these composite defects of the lower extremities often depends on the anatomical sites and the patient general condition. Local flaps are often technically possible in the proximal and middle lower extremity, but free flaps are the best choice in the distal third of the leg. Both flaps allow the patient o undergo early uninterrupted adjuvant radiotherapy, chemotherapy, and rehabilitation. ***(AM Leow, 2005)***

There have been several breakthroughs in the diagnostic imaging and treatment of the STS during the last 30 years, resulting in improved limb salvage and survival rate.

In the 1970's, computed tomography (CT) became available for local staging of STS and staging for distant metastases. Two decades later, magnetic resonance imaging (MRI), with or

without contrast enhanced sequences, replaced CT in the local staging. Recently, spiral CT was introduced, providing the surgeon with optimal three-dimensional images and further facilitating preoperative treatment planning. Computer-assisted navigation system have become available which are extremely useful in the intra operative treatment planning of sarcomas located in or near the pelvic girdle or vertebral column Improvements in the radio diagnosis of STS had a major impact in staging and in the planning of surgical treatment ***(Fenstermacher , 2003)***

In local treatment of STS there have been three successive major breakthroughs. In the 1970's, Simon and Enneking developed the concept of compartment excision. *(Simon, 1996)*

At the same time, Rosenberg et al. investigated the role of adjuvant radiation in the local treatment of limb sarcoma, showing no difference in local control and survival in patient treated with amputation compared with patients who received a limb saving procedure. ***(Rosenberg, 1982)***

Compartment excision, in the meantime, has been replaced by wide local excision, but 5% to 10% of limb sarcomas still require an amputation.

The third breakthrough was in the early 1990's, with the introduction of isolated limb perfusion (ILP) with tumor

necrosis factor-alpha (TNF-alpha) in the treatment of primarily unresectable STS of the limb. ***(Eggermont, 1996)***

Surgical resection of metastatic disease, for example isolated lung metastases, improved the disease-free and overall survival of patients. ***(Billingsley, 1999)***

The most recent breakthrough in sarcoma treatment was the introduction of the drug targeting therapy with imatinib in the treatment of disseminated gastrointestinal stromal tumors. ***(Joensuu, 2001)***