Lower Limb Coverage after Myxofibrosarcoma Resection

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Myxofibrosarcoma, the myxoid variant of malignant fibrous histiocytoma tumors, was first described by Weiss and Enzinger in 1977 [1]. This relatively rare soft tissue tumor is usually seen in the lower extremities of elderly patients [1,2]. The typical clinical morphology is a subcutaneous, slow growing, painless and discrete mass [1,2] reaching up to 27 cm in diameter [2]. Histologically, the tumor consists of nodules containing myxoid matrix (mostly hialuronic acid) separated by fibrous septa, and includes numerous elongated, curvilinear capillaries [1,2].

The tumor is pathologically graded into three subgroups: low (well-differentiated), intermediate, and high (poorly differentiated). The low-grade tumor presents a prominent vasculature that is easily recognized [2].

Pathological diagnosis is often difficult due to the similarity in architecture of other soft tissue tumors, such as atypical lipoma and epitheloid sarcoma. Early radical removal of the tumor and adjacent tissue [1], with a frozen section control, combined with adjuvant chemotherapy or radiotherapy is advised [3]. These subcutaneous tumors, particularly the high-grade type, have a tendency for local recurrence in more than 50% of the cases [1,2]. The earlier the recurrence, the poorer the prognosis. The prognosis is poor in older patients [1,2], and in cases of deeply situated tumors the mortality rate is twice that of superficially located tumors [2]. Metastases tend to be found in the lungs and pleura and to a lesser extent in lymph nodes [1]. We present here our experience with the disease.

Case Description

At the age of 36, this 71-year-old man had undergone resection of a soft tissue tumor from the upper third of his right foreleg. The tumor was diagnosed as "myxolipoma." Thirty-four years later a red lesion 5 cm in diameter appeared in the surgical scar. The lesion was diagnosed as an intermediate-grade myxofibrosarcoma. No metastases were found on a total body bone scan or on a computerized tomography scan of the chest. Magnetic resonance imaging of the right foreleg showed inflammatory changes in the pre-patellar subcutaneous region, but without bone or muscle involvement.

The tumor was widely excised, resulting in a tissue defect measuring 15x15 cm, with the patellar tendon and proximal tibia totally exposed. The paraffin-embedded pathologic specimens showed residual tumor in the upper surgical margins, and a re-excision was performed. No adjuvant radiotherapy was given. Following the re-excision of the tumor, the skin defect was covered by a pedicled medial head of gastrocnemius muscle flap and covered by a skin graft.

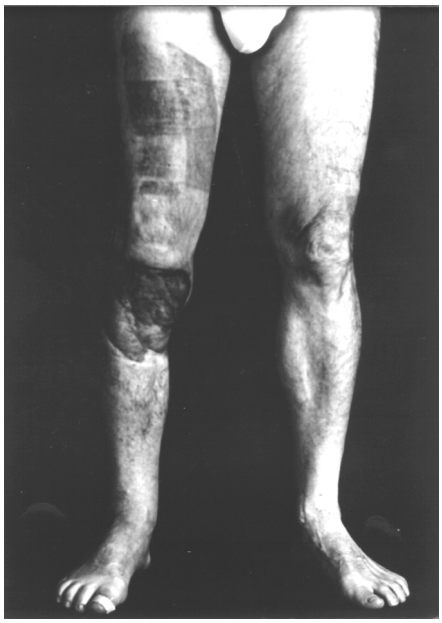
Comment

Myxofibrosarcoma is well represented by the above-described patient — an elderly man with a previous resection of an atypical lipoma in the lower extremity. Fortunately, the very late recurrence (35 years), the superficial location of the tumor, its intermediate pathological grading, and the lack of distant metastases favor a better prognosis [1]. The extent of the tumor resection is a matter of debate. Since reaching the tumor-free margins is not sufficient [1], a near-total resection of the patellar tendon and large resection of the tibia should be considered. This injury to the extensor mechanism of the knee would necessitate tibial and patellar ligament reconstruction using internal implants and tendon transfer [4]. Above-knee amputation in a case like this should be a last resort, since limb salvage is possible using compartmental resection controlled by frozen section [3].

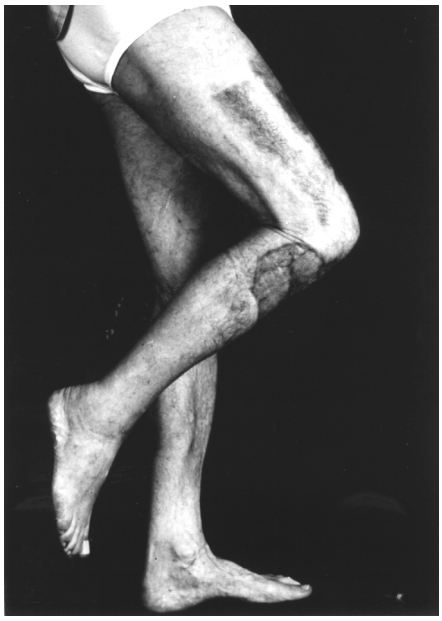
Three options were proposed for coverage of the foreleg upper third. The first is the free latissimus dorsi muscle flap, based on the thoracodorsal artery and its branches. The flap is

bulky, very reliable and has large diameter vessels [4]. Due to posterior tibial artery dominance in this case, the microanastomosis would have to be to the peroneal artery or to the anterior tibial artery. Although immediate or delayed limb reconstruction by free tissue transfer has been successfully performed after sarcoma tumor resection, we rejected this option because of the patient's history (single-vessel coronary disease and hypertension) and the risk of local and more aggressive tumor recurrence following such a major intervention. The second possibility is the cross-leg flap, which is one of the oldest methods for skin coverage of wide tissue loss in the lower extremities. This method has been in use since the end of the nineteenth century, yet it is still one of the mainstay procedures for such reconstruction [5]. Though the procedure is short and relatively simple, it was also rejected because of the high morbidity, the patient's age and his history. The two major drawbacks of the cross-leg flap in this case are the long postoperative immobilization period (15 days) and the risk of tumor transfer to the opposite leg via its pedicle. The third option is the gastrocnemius muscle flap, based on the sural artery and its branches. This should be considered the optimal choice for a tissue loss of the upper third of the foreleg. Both muscle heads can be used, and the excised patellar tendon can be reinforced with the tendon of the gastrocnemius muscle [4]. This intervention is relatively simple and does not necessitate a long immobilization period. The soleus muscle flap can be used alone or in conjunction with the gastrocnemius muscle flap.

This report presents the classical features of myxofibrosarcoma — an elderly patient with a known previously excised atypical lipoma of the right foreleg, and the development of an intermediate-grade myxofibrosarcoma in the surgical scar. The tumor is limited to the subcutaneous area with no evidence of metastases. The patient underwent wide resection, which had to be widened further due to tumor evidence in the excision margins. He did not receive any adjuvant therapy. In view of the patient's age and past history, as well as the expected morbidity, the local pedicled medial gastrocnemius muscle flap with skin graft coverage was chosen for treating the soft tissue defect.



[A] Anterior view of the right leg coverage by the medial head of the gastrocnemius muscle and split-thickness skin graft over it. The donor sites are seen on the right thigh.



[B] Lateral view of the right leg coverage.

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