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Review

Tumors of the foot and ankle — A review of the principles of diagnostics and treatment

Tumorerkrankungen von Fuß und Sprunggelenk - Grundlagen, Diagnostik und Therapie

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Summary

Bone and soft tissue masses are not particularly rare in the foot and ankle specialist's practice but true neoplasia has to be strictly differentiated from pseudotumorous lesions. Considering the proportional mass of this area, the foot and ankle is affected, relatively speaking, more frequently by neoplasia than the rest of the musculoskeletal system. Although the compact anatomy should facilitate early detection of tumors of the foot and ankle, timely diagnosis is often missed by a lack of awareness for this subject. To ensure proper diagnostical steps and correct treatment, any unclear, persistent swelling or bone lesion should be considered as a differential diagnosis for a tumorous process as any tumor entity of the musculoskeletal system can also be located at the foot and ankle. If a suspicious lump or bump of the foot and ankle cannot be further distinguished by imaging diagnostics, histopathological analysis through open or image-guided biopsy must be pursued. A major task for the foot surgeon is to assess relevant differential diagnoses and initiate the necessary steps in further diagnostics and therapy. In the interest of the patient and due to the complexity of this heterogeneous pathology, the expertise of a centre for foot and ankle surgery with a specialized tumor surgeon or a tumor centre should be consulted in unclear cases. This article presents an overview of the principles of diagnostics and treatment of foot and ankle tumors without claim of completeness.

Abbreviations: ABC, aneurysmatic bone cyst; CT, computed tomography; EMC, extraskeletal myxoid chondrosarcoma; MDT, multi disciplinary team; MRI, magnetic resonance imaging; MSTS, musculo skeletal tumor society; PVNS, pigmented villonodular synovitis; UBC, unicameral bone cyst.

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SCHLÜSSELWÖRTER
Fußtumor;
muskuloskelettaler Tumor;
Sarkom;
Weichteiltumor;
Knochentumor;
Calcaneuszyste

Zusammenfassung

Unklare Neubildungen von Fuß und Sprunggelenk sind für den Fußchirurgen keine Seltenheit. Es gilt, echte muskuloskelettale Tumoren von pseudotumorösen Läsion zu unterscheiden. Obwohl echte Tumoren des Bewegungsapparats selten sind, werden Fuß und Sprunggelenk, bezogen auf die anteilige Körpermasse, überproportional häufig von tumorösen Neubildungen betroffen. Trotz der kompakten Anatomie und geringen Weichteildeckung erfolgt die Diagnose sowohl gut- als auch bösartiger Tumorerkrankungen hier häufig verzögert. Diagnosefehler sind dabei häufiger als in anderen Körperregionen, da echte Neoplasien oft nicht in Betracht gezogen werden und Pseudotumoren imitieren können. Bei Vorliegen einer unklaren, persistierenden Schwellung oder Knochenläsion sollte daher auch immer ein Tumor differentialdiagnostisch in Erwägung gezogen werden, da prinzipiell jede Tumorentität des Bewegungsapparats auch am Fuß auftreten kann.

Die wesentliche Aufgabe des Fußchirurgen besteht darin, relevante Differentialdiagnosen zu bewerten und die erforderlichen Schritte in der weiteren Diagnostik und Therapie zeitnah einzuleiten. Kann ein suspekter Befund der Fuß- und Sprunggelenksregion mit Hilfe moderner bildgebender Diagnostik durch den Spezialisten nicht ausreichend eingegrenzt werden, so ist die Sicherug der Diagnose mittels (Probe-) Biopsie und histopathologischer Analyse anzustreben. Aufgrund der Komplexität dieses heterogenen Krankheitsbildes sollte bei unklaren Fällen immer die Expertise eines muskulo-skelettalen Tumorzentrums mit spezialisierten Radiologen und Tumororthopäden/Fußchirurgen herangezogen werden. Dieser Beitrag soll eine Übersicht der Grundsätze von Diagnose und Therapie in der Behandlung von Fuß- und Sprunggelenkstumoren bieten.

Introduction

Compared with the most common neoplasia like colon, breast or lung cancer, tumors of the musculoskeletal system are rare. With regard to the proportional body mass of the foot and ankle (3%), this part of the body is affected disproportionately often by neoplasia, though. Data from different studies suggest that approximately 5—8% of all muskuloskelatal tumors are located at the foot [1,2]. Given the rarity of musculoskeletal tumors in general, the total number of true neoplasia of the foot and ankle is small. Despite its compact anatomy and thin soft tissue coverage, the diagnosis of both benign and malignant tumors is often delayed, though. Diagnostic errors are more common than in other regions of the body since real neoplasia is often not considered. To ensure proper diagnostical steps and correct treatment, any unclear, persistent swelling or bone lesion should be considered as a differential diagnosis for a tumorous process. Basically, any tumor entity of the musculoskeletal system can also be located at the foot and ankle.

Benign tumors and tumor-like lesions are much more common than malignant tumors. Both primary malignant bone and soft tissue tumors such as chondrosarcoma or synovial sarcoma as well as metastases represent relevant differential diagnoses of unknown bone and soft tissue lesions, though. Common pseudotumorous lesions of the foot such as Morton's neuroma or ganglia have to be differentiated from real neoplasia.

A major task for the foot surgeon is to assess relevant differential diagnoses and initiate the necessary steps in further diagnostics and therapy.

Definition of foot and ankle tumors

Basically, any localized mass is a tumor. In the broadest sense, this also includes lumps and bumps based on hematoma or inflammation or any other unspecific swelling. Accordingly, the term "tumor" does not allow any conclusions on the nature or biological behavior of the mass. In a narrower sense, however, a tumor represents an abnormal growth of tissue resulting from uncontrolled, progressive multiplication of cells serving no physiological function.

Tumor-like lesions and pseudotumors can present the clinical and radiological aspect of true neoplasia, but not the biological behavior and have to be differentiated from real neoplasia. Amongst others, ganglia (both osseous and soft-tissue), gout tophi, epidermal cysts and certain entities that

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