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Imaging of Synovial Sarcoma with Radiologic-Pathologic Correlation[1]

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Synovial sarcoma is the fourth most common type of soft-tissue sarcoma, accounting for 2.5%–10.5% of all primary soft-tissue malignancies worldwide. Synovial sarcoma most often affects the extremities (80%–95% of cases), particularly the knee in the popliteal fossa, of adolescents and young adults (15–40 years of age). Despite its name, the lesion does not commonly arise in an intraarticular location but usually occurs near joints. Histologic subtypes include monophasic, biphasic, and poorly differentiated; the cytogenetic aberration of the t(X;18) translocation is highly specific for synovial sarcoma. Although radiographic features of these tumors are not pathognomonic, findings of a soft-tissue mass, particularly if calcified (30%), near but not in a joint of a young patient, are very suggestive of the diagnosis. Cross-sectional imaging features are vital for staging tumor extent and planning surgical resection; they also frequently reveal suggestive appearances of multilobulation and marked heterogeneity (creating the "triple sign") with hemorrhage, fluid levels, and septa (creating the "bowl of grapes" sign). Two features associated with synovial sarcoma that may lead to an initial mistaken diagnosis of a benign indolent process are slow growth (average time to diagnosis, 2–4 years) and small size (<5 cm at initial presentation); in addition, these lesions may demonstrate well-defined margins and homogeneous appearance on cross-sectional images. Synovial sarcoma is an intermediate- to high-grade lesion, and, despite initial aggressive wide surgical resection, local recurrence and metastatic disease are common and prognosis is guarded. Understanding and recognizing the spectrum of appearances of synovial sarcoma, which reflect the underlying pathologic characteristics, improve radiologic assessment and are important for optimal patient management.

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