

Kötü Huylu Yumuşak Doku Tümörleri

Doç. Dr. Seyit Ali Gümüştaş

Giriş

- İyi huylu yumuşak doku tümörlerine göre 100 kat daha nadir
- Sıklıkla 40 yaş üstü hastalar
- Erkeklerde daha sık
- En sık uylukta yerleşir
- Sıklıkla şişlik, nadiren ağrı şikayeti olur
- Kural olarak ilaçlı MR çekilmeli

Klinik

- İyi-kötü ayırımında boyut, yerleşim yeri, büyüme hızı ve ağrı varlığı önemlidir

Table 1 The frequency of clinical features by diagnosis

	Sample total	Feature	Malignant	Benign
Size	526	5 cm	222	93
		<5 cm	53	158
Pain	470	Present	91	50
		Absent	132	197
Change in size	470	Increasing	141	44
		Static	82	203
Depth	470	Deep	209	171
		Superficial	14	76

Clinical features of soft tissue sarcomas

KARAKTERİSTİK ÖZELLİKLER

Bazı tümörler spesifik yerleşim yeri, görülme yaşı ve yayılım gibi özellikler gösterirler

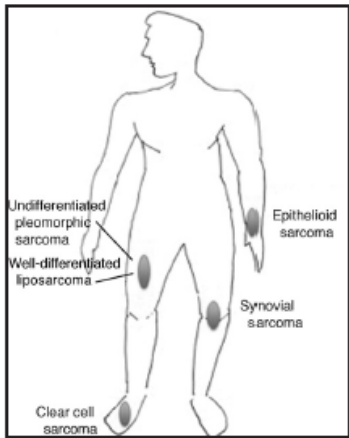


Figure 1. Frequent sites of occurrence of common soft tissue sarcomas in the extremities.

Table 1. Differentiating Characteristics of Soft Tissue Sarcomas

Characteristics	Tumors
Age, year	
<10	Rhabdomyosarcoma
20–40	Clear cell sarcoma, epithelioid sarcoma, and synovial sarcoma
>40	Liposarcoma, leiomyosarcoma, and undifferentiated pleomorphic sarcoma
Around tendons and aponeuroses	Synovial sarcoma, clear cell sarcoma, and epithelioid sarcoma
Lymph node metastases	Synovial sarcoma, epithelioid sarcoma, clear cell sarcoma, and rhabdomyosarcoma
Superficial soft tissues	Myxofibrosarcoma and angiosarcoma
Calcifications	Undifferentiated pleomorphic sarcoma, well-differentiated liposarcoma, extraskeletal osteosarcoma, and synovial sarcoma
Prominent vascular channels	Angiosarcoma, epithelioid hemangioendothelioma, and alveolar soft part sarcoma
Clinical history	
Prior radiation/trauma	Extraskeletal osteosarcoma
Prior radiation/chronic lymphedema	Angiosarcoma

Imaging of Soft Tissue Sarcomas

Roopa Ram, MD, Tarun Pandey, MD, Richard Nicholas, MD, and Kedar Jambhekar, MD

After participating in this activity, the radiologist should be better able to evaluate the usual sites of involvement, possible risk factors, and imaging features, particularly on MRI, of soft tissue sarcomas.

MR görüntüleme

- Bazı MR bulguları (tümör sınırlarının düzensiz olması ve tümör etrafındaki ödem vs) histolojik derece ile ilişkilidir

Table 1 The correlation of MRI features to pathologic grade of soft tissue sarcoma

Pathologic grade	Cases	Well-defined	Margin Mixed	Poorly defined	Peritumoral high signal intensity sign	Peritumoral low signal intensity capsule-like sign
I	20	12	6	2	16	
II	19	5	9	5	12	3
III	20	0	8	12	17	3

Clinical Research Paper

Correlation of MRI features to histopathologic grade of soft tissue sarcoma

Qing-Yu Liu,^{1,*} Hai-Gang Li,² Jian-Yu Chen¹ and Bi-Ling Liang¹

MR Görüntüleme

MR tümör ile kanama sonrası gelişen hematom ayırımında bize yardımcıdır

TABLE 1: Features That Can Help Differentiate Hematoma From Blood Within Tumor When Blood Is Present Within Lesion

Typical Features	
Hematoma	Tumor
History of trauma or anticoagulants	Spontaneous bleeding
Surrounding edema	Limited surrounding edema
Curvilinear high-signal-intensity foci	No specific morphology of high-signal-intensity regions
Thick nonnodular wall	Nodular wall
Rim enhancement	Heterogeneous enhancement
Hemosiderin in wall if chronic	No or limited hemosiderin in wall

MR Görüntüleme

- Histolojik derece tahmin edilebilir

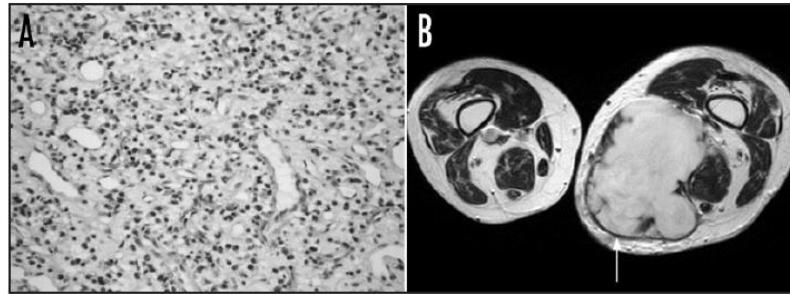


Figure 1. Grade I myxofibrosarcoma in the left thigh. (A) Fibrosarcoma cells are sparsely arranged, cell atypia is not obvious and few nuclear mitosis are noted (HE $\times 200$). (B) On T_2 -weighed axial MR image, tumor margin is well defined with peritumoral low signal intensity capsule-like sign (arrow).

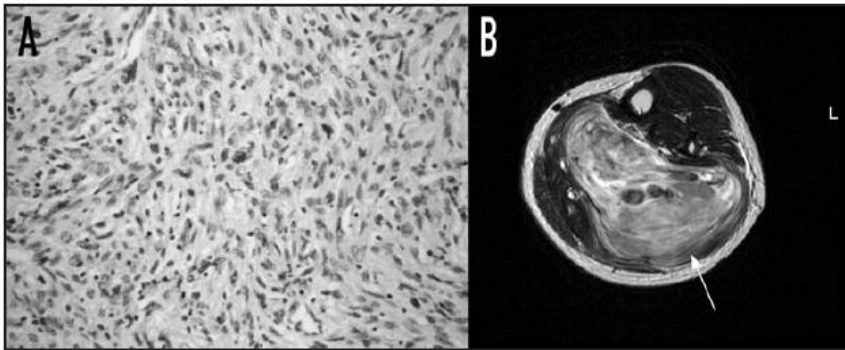


Figure 2. Grade II liposarcoma in the right leg. (A) Many liposarcoma cells are spindle; obvious cell atypia and scanty nuclear mitosis are noted (HE $\times 200$). (B) On T_2 -weighed axial MR image, tumor margin is poorly defined with peritumoral high signal intensity sign (arrow).

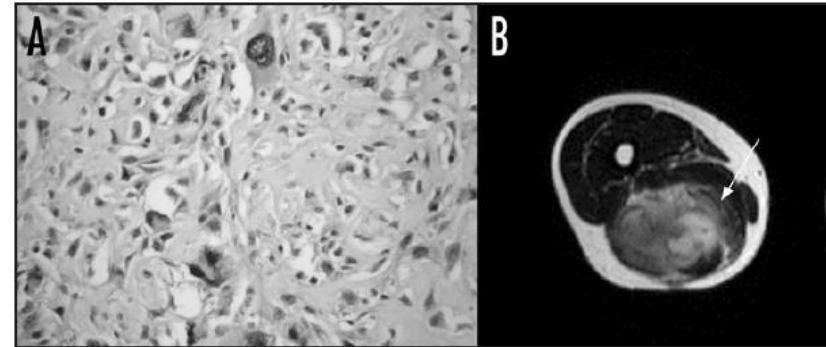


Figure 3. Grade III malignant fibrous histiocytoma in the right thigh. (A) Obvious cell atypia and giant cells are showed in malignant fibrous histiocytoma tissue (HE $\times 200$). (B) On T_2 -weighed axial MR image, tumor margin is poorly defined with peritumoral high signal intensity sign (arrow).

MR Görüntüleme

Nekroz varlığı kötü huylu tümör lehinedir

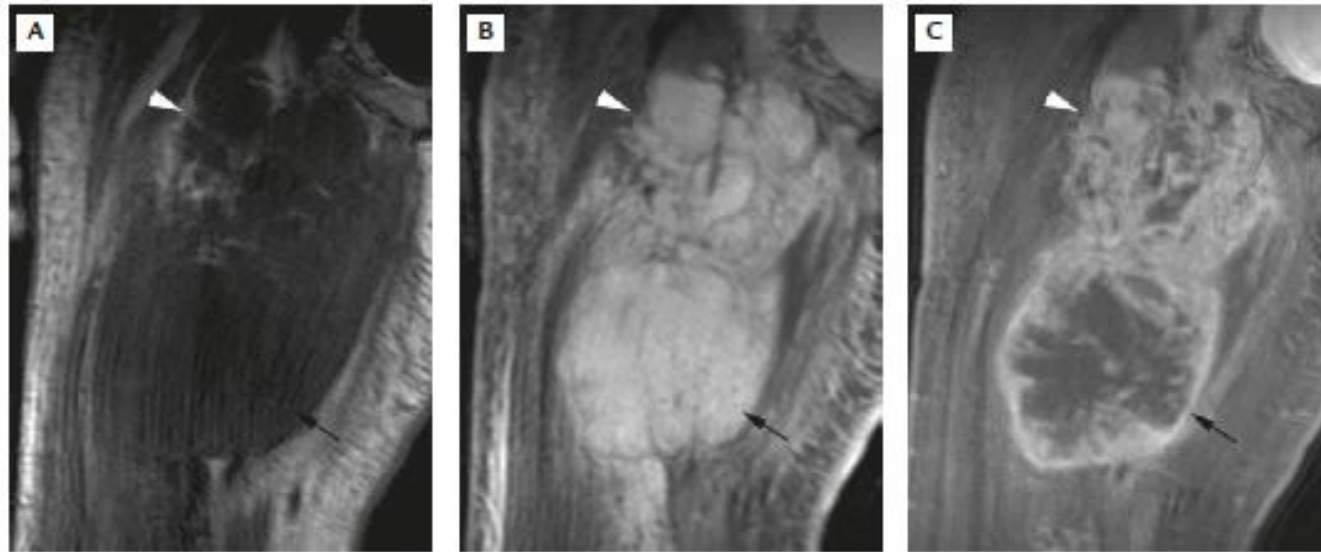


Figure 3. Demonstration of necrosis in pathologically proven leiomyosarcoma in a 79-year-old woman with painful swelling of the right thigh for 3 months. (A) Low signal region on coronal T1-weighted imaging (arrow); and (B) high density on coronal T2-weighted imaging (arrow) were suggestive of necrosis. (C) In post-contrast coronal T1-weighted imaging, the lesion revealed peripheral enhancement (arrow). Non-necrotic solid tissue part (arrowheads) was also seen.

BT-MR Anjiografi

Tümörün damarlamasını görüntüleme amaçlı kullanılabilir

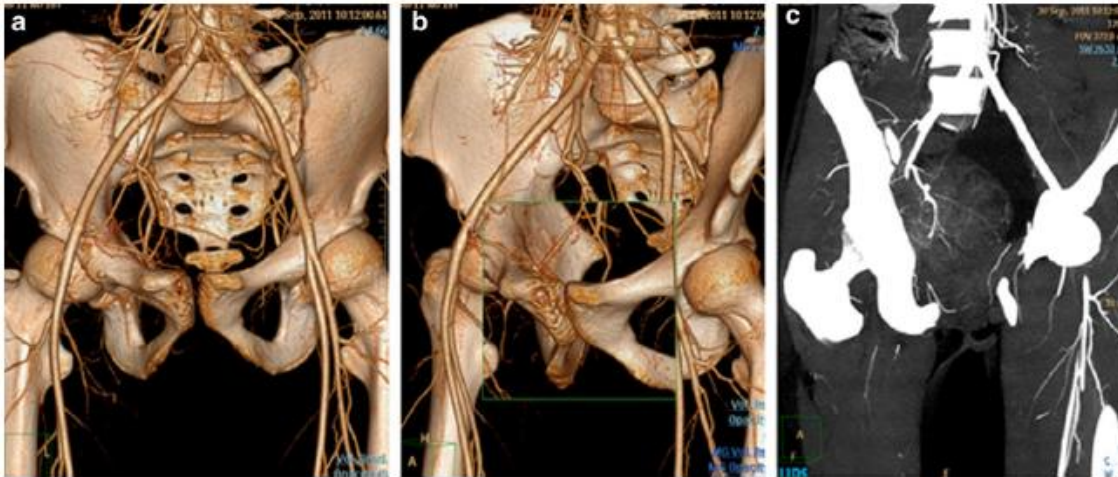


Fig. 6 CT angiographic images (volume rendered, a & b and MIP, c) showing vascular anatomy in case of pelvic STS. Bony involvement can also be accurately demonstrated

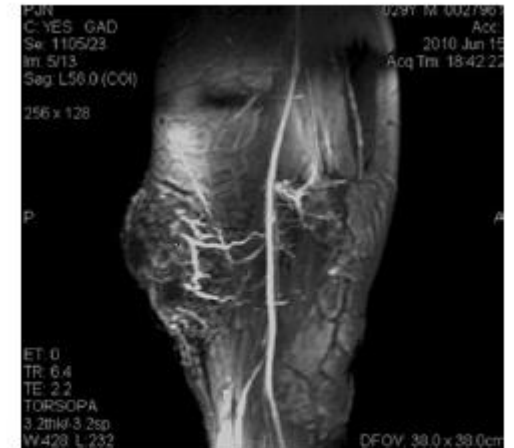


Fig. 9 MR TOF angiographic image showing vascular supply of the tumor

Imaging Spectrum in Soft Tissue Sarcomas

Pallavi Aga • Ragini Singh • Anit Parihar •
Umesh Parashari

Kitlenin Yerleşimi

Derin yerleşimli tümörlerin kötü huylu olma olasılığı daha yüksek olup yüzeysel yerleşimliler de nadir de olsa kötü huylu olabilir

Table 3 Depth of lesion relative superficial investing fascia of benign, malignant, and non-neoplastic groups

	Deep	Superficial
Benign	165 (29%)	32 (6%)
Malignant	243 (42%)	45 (8%)
Non-neoplastic	72 (13%)	14 (2%)
Total	480 (84%)	91 (16%)

Percentages given are for each group relative to the total study number $n = 571$.

MRI of soft-tissue masses: the relationship between lesion size, depth, and diagnosis

A. Datir^a, S.L.J. James^{b,*}, K. Ali^a, J. Lee^a, M. Ahmad^a, A. Saifuddin^a

Tanı-Biyopsi

- Biyopsi yapılmadan herhangi bir girişim yapılmamalı!
- İnce iğne yapılmamalı
- Tru-cutt tercih edilmeli
- Bazı olgularda görüntüleme (USG,BT) eşliğinde yapılmalı
- Tercihen ameliyatı yapacak olan cerrah biyopsiyi yapmalı
- Deneyimli patolog değerlendirmeli
- Nadiren açık (insizyonel) biyopsi gerekebilir

Tipleri

- Özellikle köken aldığı dokuya göre birçok farklı tip vardır
 - Most common types:
 - Undifferentiated/unclassified sarcoma (pleomorphic/round cell/spindle cell)
 - Liposarcoma
 - Leiomyosarcoma
 - Synovial sarcoma
 - Malignant peripheral nerve sheath tumor (MPNST)
 - Rhabdomyosarcoma
 - Primitive neuroectodermal tumor (PNET) /extraskkeletal Ewings
 - Angiosarcoma
 - Ephithelioid sarcoma
 - Clear cell sarcoma
 - Alveolar soft part sarcoma
 - Solitary fibrous tumors

Histolojik Derece

- Özellikle bazı tipler yüksek derecelidir

Histological type	Histological grade		
	I	II	III
Fibrosarcoma			
Infantile fibrosarcoma			
Dermatofibrosarcoma protuberans			
Malignant fibrous histiocyoma			
Liposarcoma			
Well-differentiated liposarcoma			
Myxoid liposarcoma			
Round cell liposarcoma			
Pleomorphic liposarcoma			
Leiomyosarcoma			
Rhabdomyosarcoma			
Angiosarcoma			
Malignant hemangiopericytoma			
Synovial sarcoma			
Malignant mesothelioma			
Malignant schwannoma			
Neuroblastoma			
Ganglioneuroblastoma			
Extraskeletal chondrosarcoma			
Myxoid chondrosarcoma			
Mesenchymal chondrosarcoma			
Extraskeletal osteosarcoma			
Malignant granular cell tumor			
Alveolar soft part sarcoma			
Epithelioid sarcoma			
Clear cell sarcoma			
Extraskeletal Ewing's sarcoma			

Metastaz (Yayılım) Taraması

- Tanı konduktan sonra metastaz varlığı açısından vücut taraması (PET_CT vs) yapılmalı
- En sık akciğere metastaz yaparlar
- Bazı tümörler kan diğerleri lenfatik yolla yayılır
 - Extremity
 - Hematogenous....predominantly to the lung*
 - At diagnosis 10%
 - Exceptions: myxoid liposarcoma
 - Lymphatic.....rare, except certain pathologies#
 - Epithelioid (18%)
 - Rhabdomyosarcoma (12%)
 - Clear cell sarcoma (11%)
 - Angiosarcoma (13%)
 - Other reports: synovial cell, extraskeletal Ewings

*Christie-Large M et al. Eur J Ca 2008; 44:1841.

#Riad S et al. Clin Orth Rel Res 2004;426:129. Fong Y et al. Ann Surg 1993; 217:72.

PET-CT

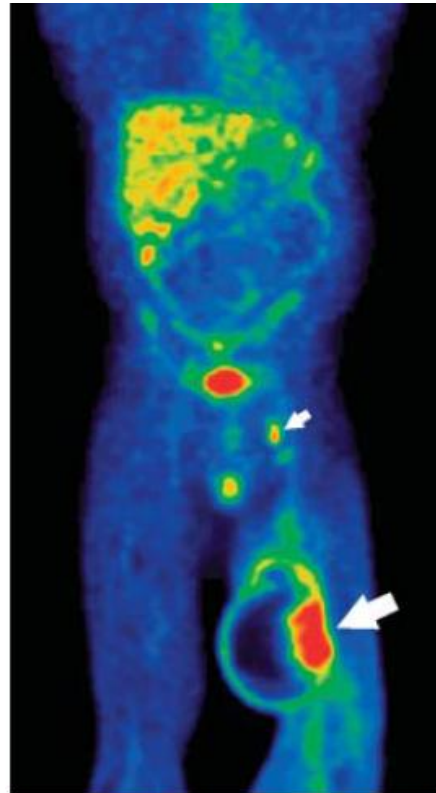


Fig 4. — Coronal reformatted PET image obtained from 3-dimensional data shows high-grade malignant fibrous histiocytoma in the thigh (large arrow). Absence of central activity in the mass reflects necrosis and hemorrhage. Note small hypermetabolic regional lymph node in the groin (small arrow).

Diagnostic Imaging Update: Soft Tissue Sarcomas

Edson L. Knapp, MD, Mark J. Kransdorf, MD, and G. Douglas Letson, MD

Sınıflama

- Histolojik derece, tümörün yerleşimi ve yayılımına göre yapılır

Stage	Grade	Site
IA	Low (G ₁)	Intracompartmental (T ₁)
IB	Low (G ₁)	Extracompartmental (T ₂)
IIA	High (G ₂)	Intracompartmental (T ₁)
IIB	High (G ₂)	Extracompartmental (T ₂)
III	Any (G) Regional or distant metastasis	Any (T)

Table 1: Enneking's surgical staging.

Table 1 Definitions and Staging System of the American Joint Committee on Cancer, 7th Edition [74]

	Primary tumour	Regional Lymph Nodes	Distant metastasis	Grade ^a
Stage IA	T1a	N0	M0	G1, GX
	T1b	N0	M0	G1, GX
Stage IB	T2a	N0	M0	G1, GX
	T2b	N0	M0	G1, GX
Stage IIA	T1a	N0	M0	G2, G3
	T1b	N0	M0	G2, G3
Stage IIB	T2a	N0	M0	G2
	T2b	N0	M0	G2
Stage III	T2a, T2b	N0	M0	G3
	Any T	N1	M0	Any G
Stage IV	Any T	Any N	M1	Any G

Primary Tumour (T)

TX, Primary tumour cannot be assessed

T0, No evidence of primary tumour

T1, Tumour 5 cm or less in greatest dimension*

-T1a, Superficial tumour

-T1b, Deep tumour

T2, Tumour larger than 5 cm in greatest dimension*

-T2a, Superficial tumour

-T2b, Deep tumour

*Note: Superficial tumour is located exclusively above the superficial fascia without invasion of the fascia; deep tumour is located either exclusively beneath the superficial fascia, superficial to the fascia with invasion of or through the fascia, or both superficial to and beneath the fascia

Regional Lymph Nodes (N)

NX, Regional lymph nodes cannot be assessed

N0, No regional lymph node metastasis

N1**, Regional lymph node metastasis

**Note: Presence of positive nodes (N1) in M0 tumours is considered Stage III

Distant Metastasis (M)

M0, No distant metastasis

M1, Distant metastasis

^aSee Table 2 for explanation FNCLCC grading system

Tedavi

- Bu hastalara rutin kemoterapi (KT) uygulanmamakta
- Özellikle metastaz varlığında, derin, büyük yerleşimli ve yüksek dereceli bazı spesifik (rabdomyosarkom, leiomyosarkom vs) alt tiplerde kemoterapi uygulanmakta
- Temiz/geniş sınırlar ile tümör çıkarılmalı
- Ameliyat öncesi ve sonrası radyoterapi (RT) eklenmeli.
- Ameliyat öncesi ve sonrası radyoterapinin avantaj ve dezavantajları olup birbirine kesin üstünlükleri yoktur.

KT Duyarlılığı

TABLE 4: Soft tissue sarcomas grouped by chemosensitivity.

Relative chemosensitivity	Examples of soft tissue sarcomas
Chemotherapy integral to management	(i) Ewing's sarcoma family tumours (ii) Embryonal and alveolar rhabdomyosarcoma
Chemosensitive	(i) Synovial sarcoma (ii) Myxoid/round cell liposarcoma (iii) Uterine leiomyosarcoma
Moderately chemosensitive	(i) Pleomorphic liposarcoma (ii) Myxofibrosarcoma (iii) Epithelioid sarcoma (iv) Pleomorphic rhabdomyosarcoma (v) Leiomyosarcoma (vi) Malignant peripheral nerve sheath tumour (vii) Angiosarcoma (viii) Desmoplastic small round cell tumour (ix) Scalp and face angiosarcoma
Relatively chemo-insensitive	(i) Dedifferentiated liposarcoma (ii) Clear cell sarcoma (iii) Endometrial stromal sarcoma
Chemoinensitive	(i) Alveolar soft part sarcoma (ii) Extraskeletal myxoid chondrosarcoma

Ameliyat öncesi ve sonrası RT

Ameliyat öncesi RT uygulamanın en sık riski yara problemi gelişmesi olup, ameliyat sonrası RT uygulamada ise sertlik ve ödemdir

Table 3 Advantages and disadvantages of pre- and postoperative radiotherapy

	Advantages	Disadvantages
Preoperative Radiotherapy	• Smaller RT volume • Easier resection • Better oxygenations and vascularization of the area => larger effect • Reduction of late complications	• Wound complications • Postponing surgery • Fibrosis that could hamper surgery
Postoperative Radiotherapy	• Better staging • Less scar complications	• Large RT Volumes • More late complications (fibrosis, joint stiffness, oedema) • Need for demarcation of the operation field (clips)

REVIEW

Open Access

Soft tissue sarcoma of the extremities:
pending questions on surgery and
radiotherapy



Fien Hoefkens¹, Charlotte Dehandschutter¹, Johan Somville^{1,2}, Paul Meijnders^{1,3} and Dirk Van Gestel^{3,4*}

Tedavi-Takip

- Gelişebilecek yara problemlerinin çözümünde plastik cerrahisi desteği önemlidir
- Hastaların %10'unda (damar-sinir tutulumu, nüks varlığı, yara problemleri vs) amputasyon gerekir
- Yaşam süresi açısından en önemli faktör metastaz varlığıdır.
- Tümörün histolojik derecesi, büyüklüğü, derin yerleşimi diğer etmenlerdir.
- Tekrarlama riski açısından belirli aralıklarla yakın takip gerekir

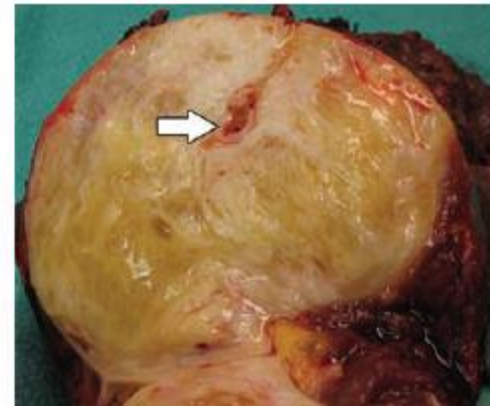
Ana Damar-Sinir Yapılarının Tutulması



Figure 18. Tumor encasement of a critical structure. (a) Axial T2-weighted fat-saturated MR image shows a rhabdomyosarcoma in the right thigh. The tumor encases the sciatic nerve (arrow) and abuts distal superficial femoral vessels. (b) Photograph of the pathologic specimen shows the tumor surrounding the sciatic nerve (arrow).



a.



b.

Tanı-Tedavi Algoritması

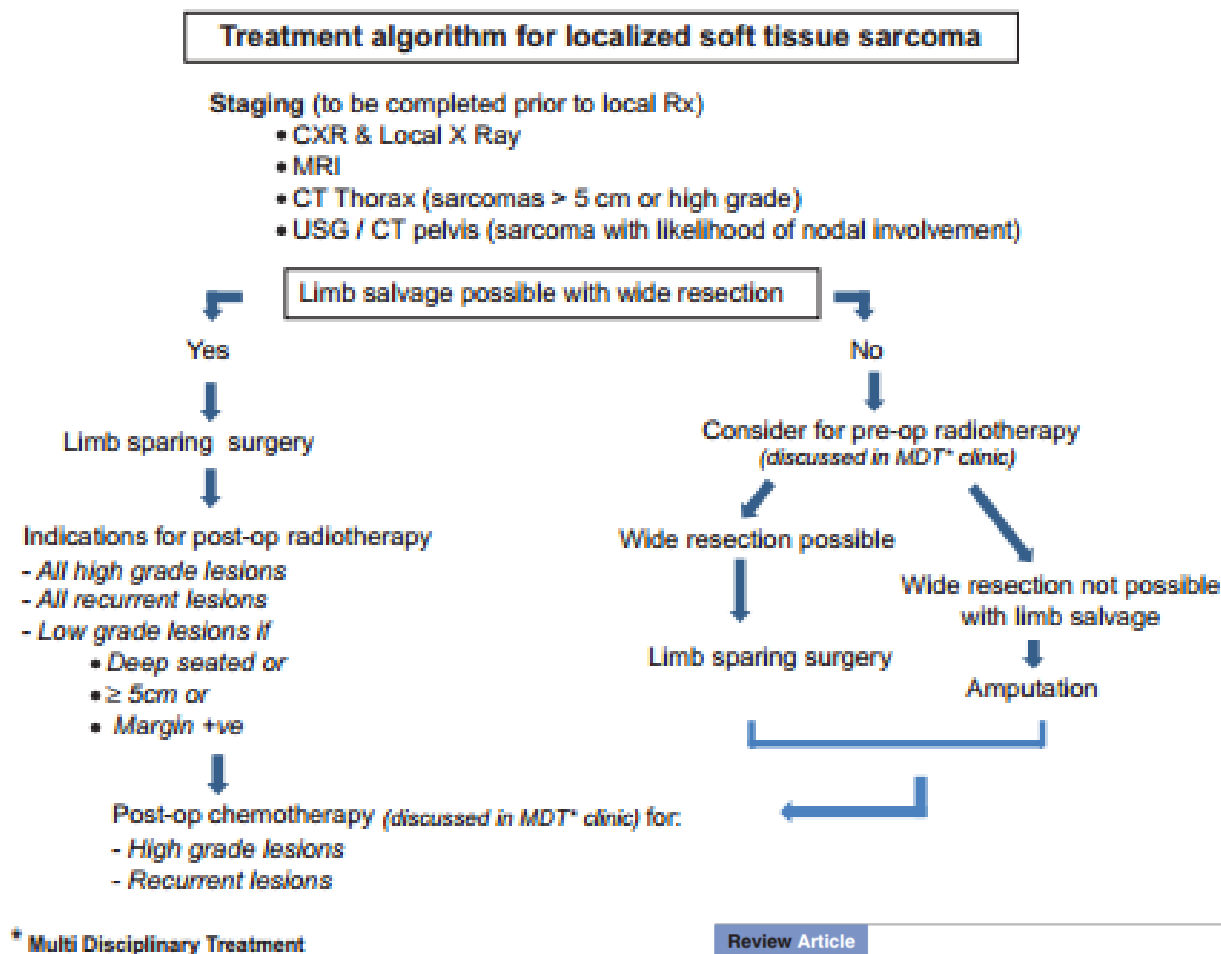


Figure 1: Treatment algorithm for localized soft tissue sarcoma



Tipleri

- İndiferansiye pleomorfik sarkom (Malign fibröz histiositom)
- Liposarkom
- Fibrosarkom
- Dermatofibrosarkoma protuberans
- Sinovyal sarkom
- Epiteloid sarkom
- Clear cell sarkom
- Rabdomyosarkom
- Malign periferel sinir kılıfı tümörü

İndiferansiye pleomorfik sarkom (IPS)

- Eski ismiyle malign fibröz histiyositom
- En sık kötü huylu yumuşak doku tümörü
- 55-80 yaş arası erkeklerde sık
- Genellikle derin, yavaş büyüyen ağrısız kitle
- Cerrahi radyoterapi ile kombine edilir
- Seçilmiş vakalarda KT uygulanabilir
- Beş yıllık sağkalım %50-60

İndiferansiye pleomorfik sarkom

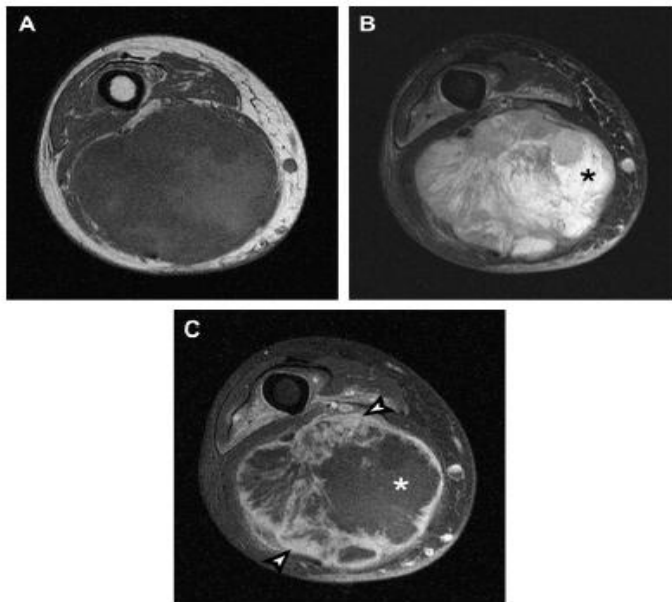


Fig. 2. MFH. MFH in an 82-year-old man with a posterior thigh mass. (A) Axial T1W (repetition time/echo time [TR/TE], 650/18) and (B) T2W fat-saturated (TR/TE, 4700/50) images demonstrate a large thigh lesion in an intramuscular location within the semimembranosus muscle. Note the significant necrosis (asterisk). (C) Irregular peripheral, septal, and nodular enhancing components are noted on a T1W fat-saturated postcontrast (TR/TE, 550/18) image (arrowheads). Postcontrast images are valuable to guide biopsy to areas of viable tissue. Asterisk denotes nonenhancing areas on (C) that correspond to high signal areas on (B) representing necrosis.

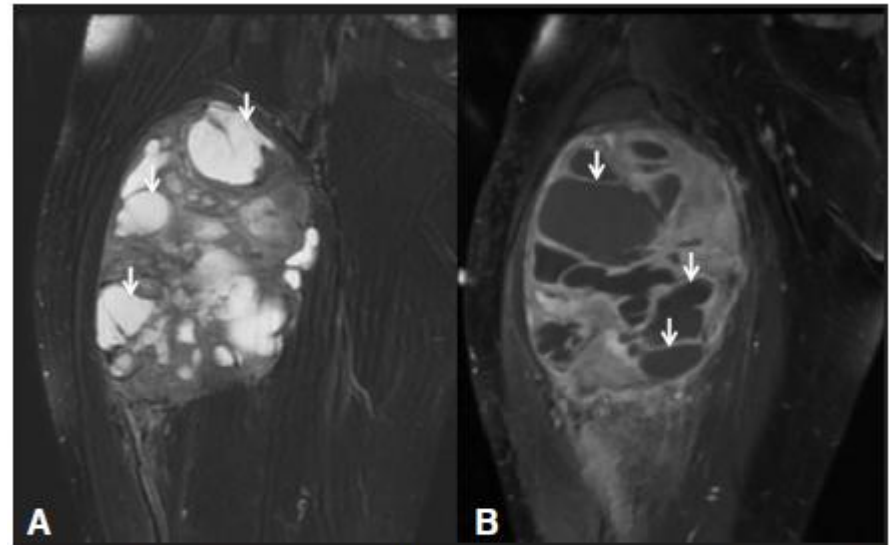
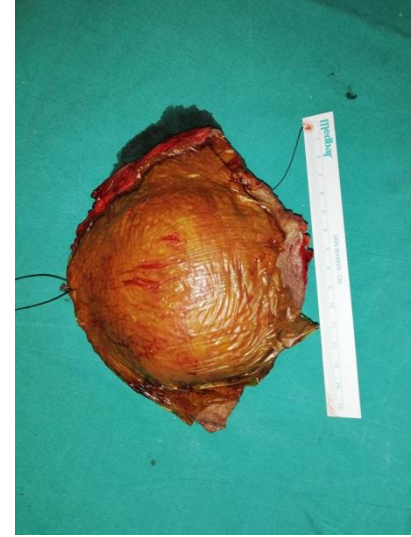
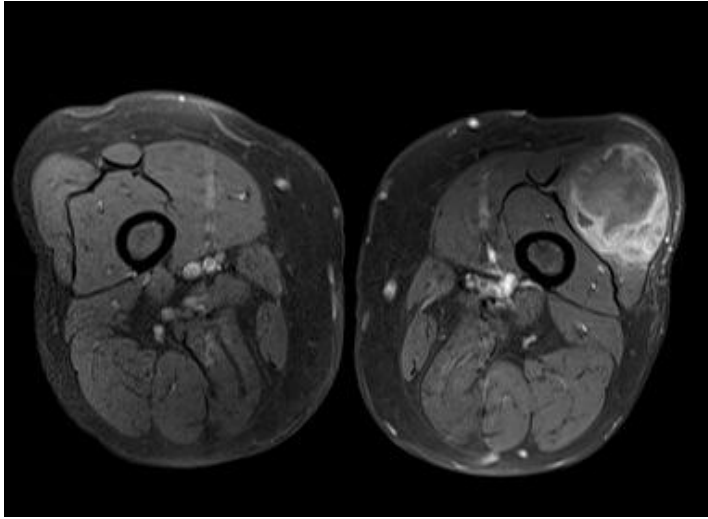


Figure 7. Undifferentiated pleomorphic sarcoma. Coronal T2-weighted MR image (A) and postcontrast fat-suppressed T1-weighted MR image (B) through the right thigh show a heterogeneously enhancing intramuscular mass with multiple nonenhancing foci of T2 hyperintensity representing tumor necrosis (arrows in A and B).

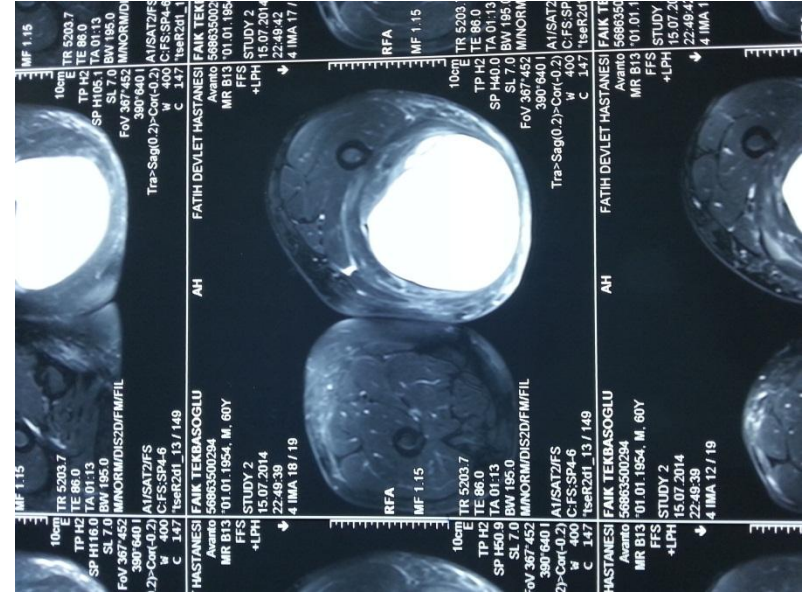
SAĞ OMUZ IPS REZEKSİYON-PEKTORAL FLEP



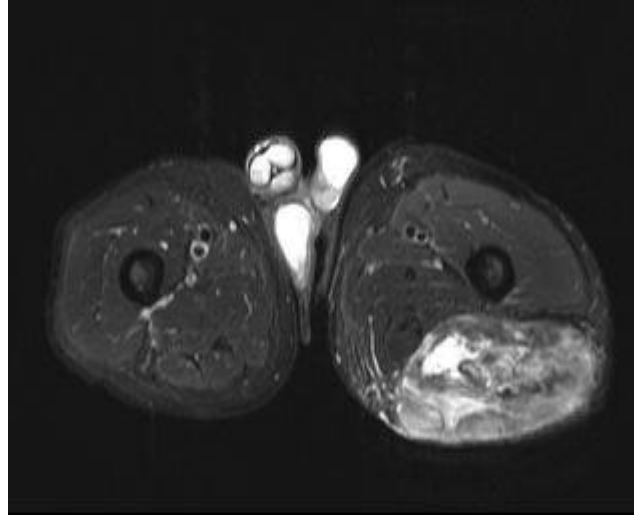
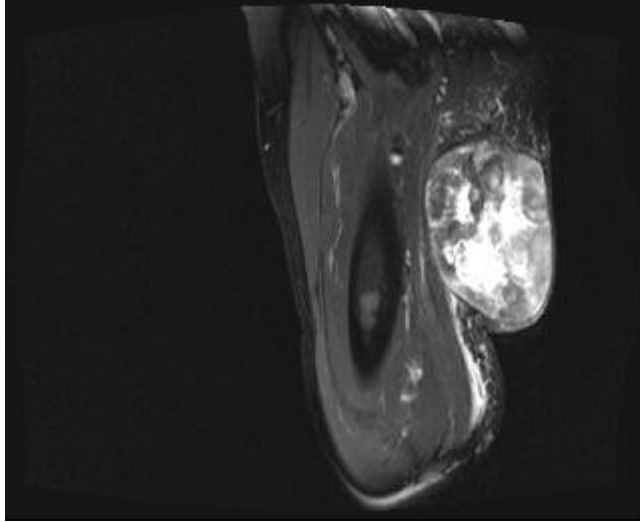
İNDFERANSİYE PLEOMORFİK SARKOM



İD FERANSİYE PLEOMORFİK SARKOM

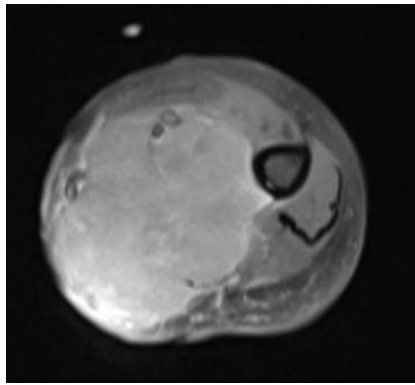


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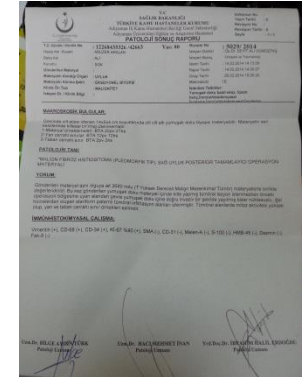
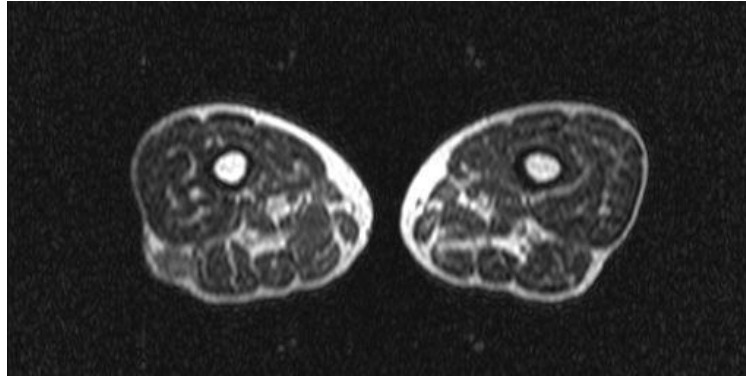
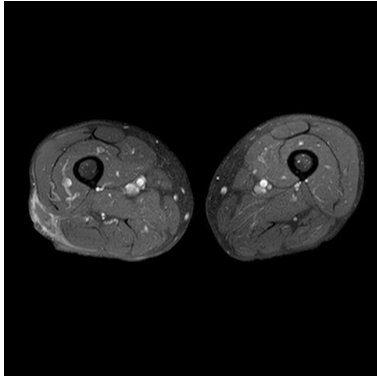


KOL IPS

Geniş rezeksiyon + A-V Graft + Latis Flap



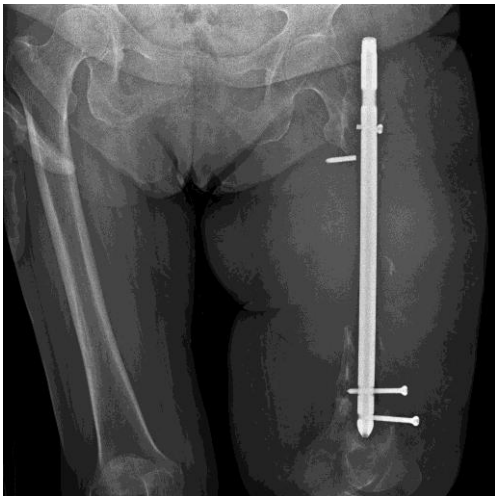
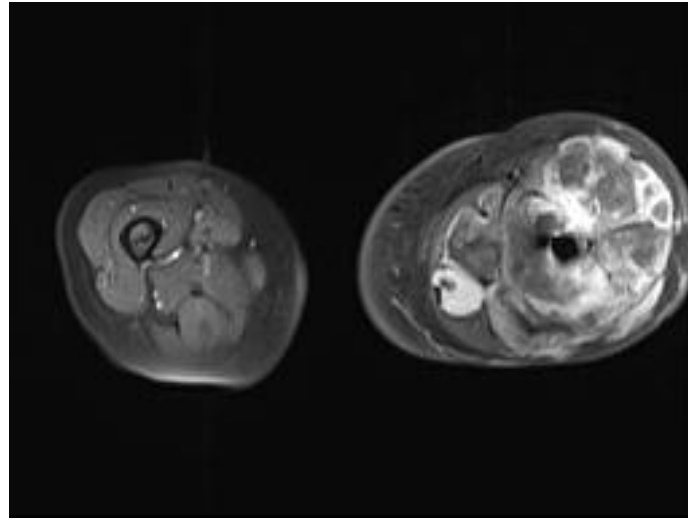
REZİDÜ İPS- YATAK REZEKSİYONU



REZİDÜ İPS-YATAK REZEKSİYONU



İNDFERANSİYE PLEOMORFİK SARKOM



Liposarkom

- İkinci en sık kötü huylu yumuşak doku tümörü
- 50-80 yaş erkeklerde sık
- Farklı alt tipleri (iyi diferansiye, miksoid, yuvarlak hücreli, pleomorfik ve dediferansiye) vardır
- Yavaş büyüyen ağrısız kitle (nadiren ağrılı)
- Geniş rezeksiyon ve radyoterapi uygulanmalı
- Seçilmiş vakalarda KT verilerbilir

DEDİFERANSİYE LİPOSARKOM

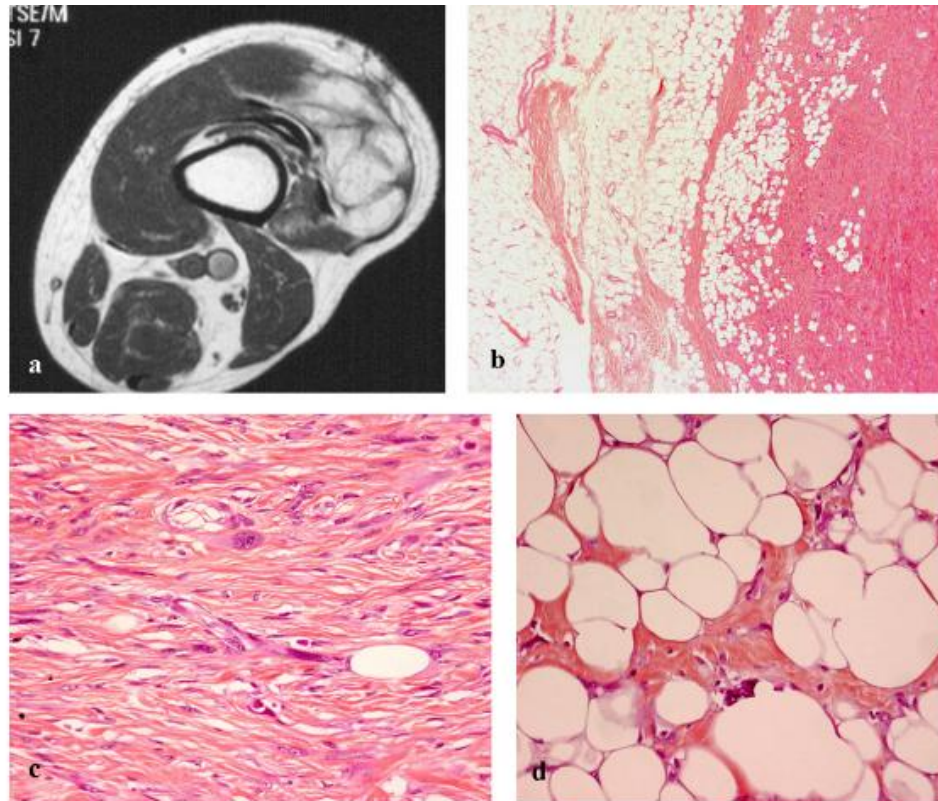


Fig. 7. Dedifferentiated liposarcoma of the right thigh. (a) Transverse T1-weighted spin-echo MR: liposarcoma of the anterior compartment of the thigh with a solid tissue nodule. (b) Histologically, at low magnification, the lesion is composed of two different areas: one composed of adipocytic tissue and one composed of a dense cellular proliferation with a fibrous stroma (HES, 40x). (c) The later component is composed of atypical spindle cells with atypical hyperchromatic nuclei in a collagenous stroma (HES, 400x). (d) In the well-differentiated zone, atypical cells with hyperchromatic nuclei are also identified within adipocytic cells (HES, 400x).

LIPOSARKOMA

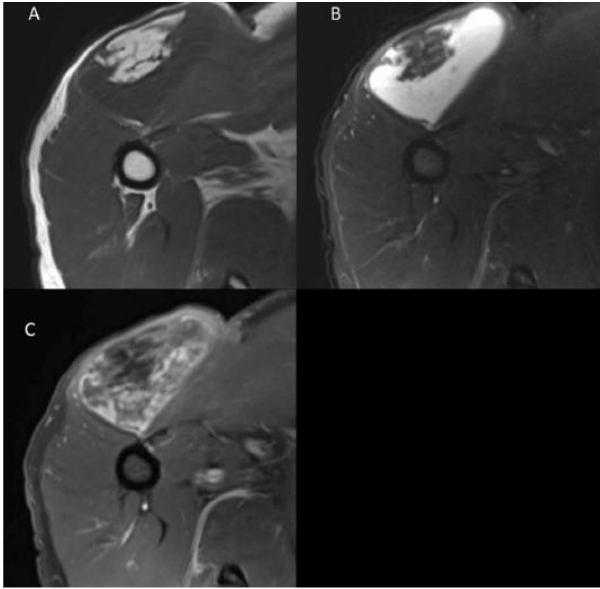


Fig. 5: Liposarcoma. T1, fat suppressed and post gadolinium T1 FS sequences show a fat containing lesion in the anterior upper arm. There is a large, enhancing, non-fatty component.

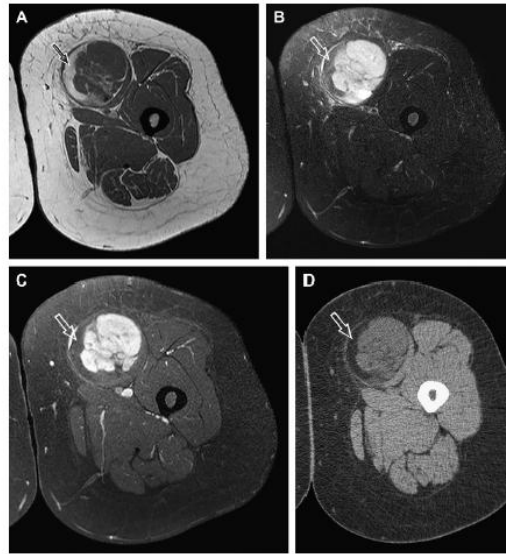


Fig. 4. Myxoid liposarcoma. Myxoid liposarcoma in a 48-year-old woman with a left thigh mass slowly growing over 1 year. (A) T1W (repetition time/echo time [TR/TE], 745/35) MR image demonstrates peripheral and septal areas of high signal (arrow). These regions correspond to areas of intermediate to low signal on both (B) T2W fat-suppressed (TR/TE, 580/70), and (C) T1W postcontrast fat-suppressed (TR/TE, 638.3/7) images following the signal characteristics of fat. The lipid component is less than 10% of the total tumor volume. The pattern of enhancement (or imaging features on ultrasonography) can help differentiate myxomatous tumors from truly cystic lesions, which they can mimic on T2W and other fluid-sensitive MR images. (D) Axial CT demonstrates low-attenuation lipid component following the same pattern.

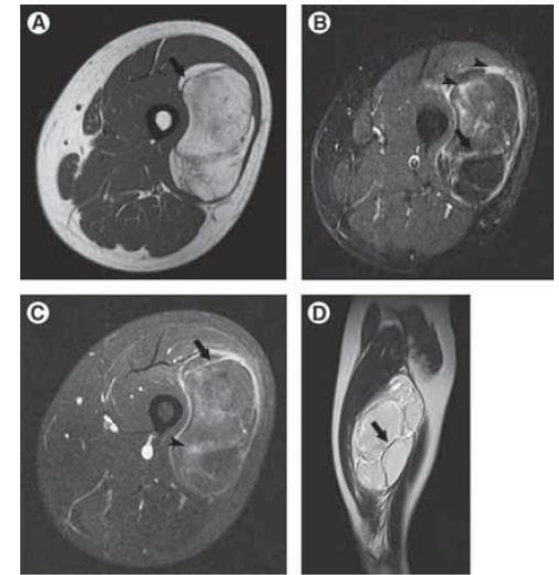


Figure 8 Well-differentiated Liposarcoma. A 31-year-old woman with thigh pain status post fall. (A) Axial T1-weighted (TR/TE; 500/12), (B) short tau inversion recovery (STIR) (TR/TE; 7688/18), (C) T1-weighted fat saturation post-contrast (TR/TE; 468/12), and (D) sagittal T2-weighted (TR/TE; 4303/120) images demonstrate a high-signal intensity intramuscular lipomatous lesion with predominantly fatty signal, but thickened septa (arrows) and mild nodularity (arrowheads).

İYİ DİFERANSİYE LİPOSARKOMA MİKSOİD LİPOSARKOMA

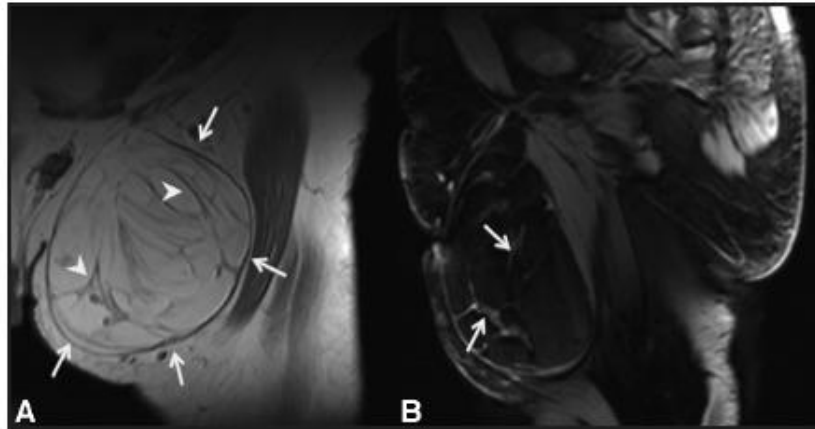


Figure 2. Well-differentiated liposarcoma of the medial thigh. **A:** Coronal pre-contrast T1-weighted MR image shows a well-circumscribed, multilobulated predominantly T1 hyperintense fatty mass (*arrows*) with internal septations and nodules (*arrowheads*). **B:** Postcontrast sagittal T1-weighted fat-suppressed MR image shows enhancement within the septa (*arrows*).

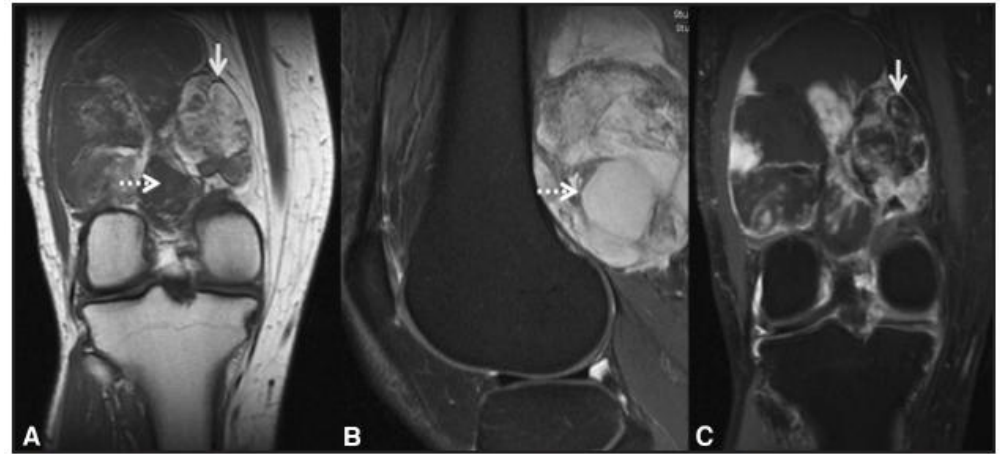


Figure 3. Myxoid liposarcoma about the knee. Coronal precontrast T1-weighted MR image (**A**), sagittal fat-saturated T2-weighted MR image (**B**), and coronal postcontrast fat-saturated T1-weighted MR image (**C**) show a large heterogeneously enhancing and fat-suppressed lobulated mass (*solid arrow in C*) that on the precontrast T1-weighted MR image has foci of bright fat (*solid arrow in A*). Myxoid tissue appears as foci of T1 hypointensity and T2 hyperintensity within the mass (*dotted arrows in A and B, respectively*).

PLEOMORFİK LİPOSARKOMA DEDİFERANSİYE LİPOSARKOMA

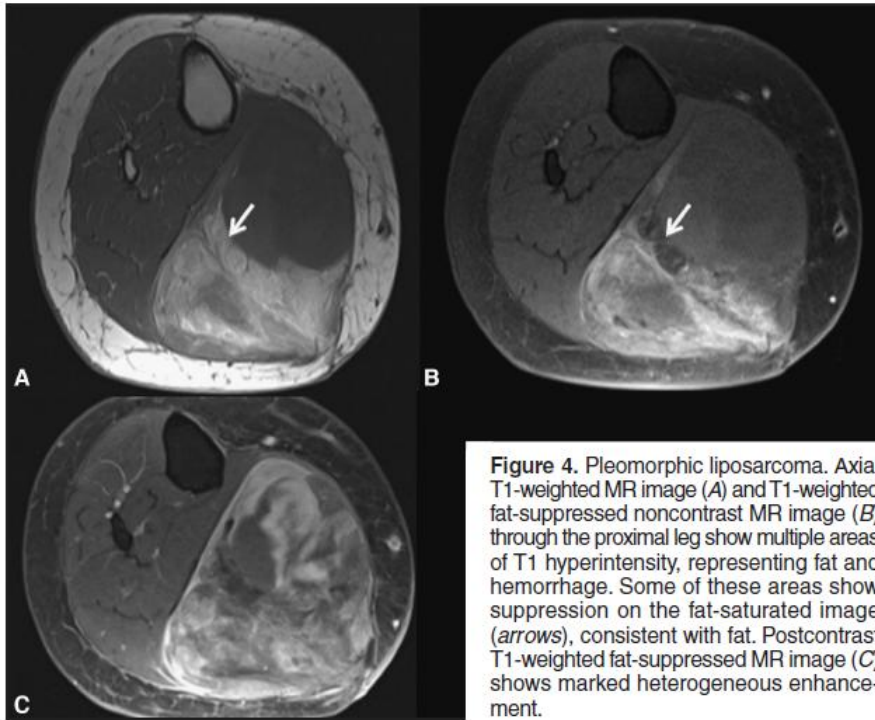


Figure 4. Pleomorphic liposarcoma. Axial T1-weighted MR image (A) and T1-weighted fat-suppressed noncontrast MR image (B) through the proximal leg show multiple areas of T1 hyperintensity, representing fat and hemorrhage. Some of these areas show suppression on the fat-saturated image (arrows), consistent with fat. Postcontrast T1-weighted fat-suppressed MR image (C) shows marked heterogeneous enhancement.

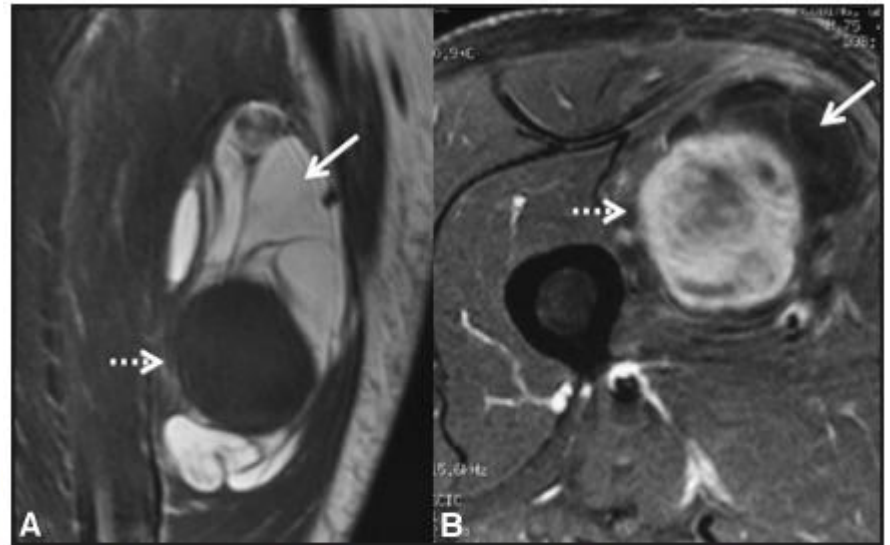
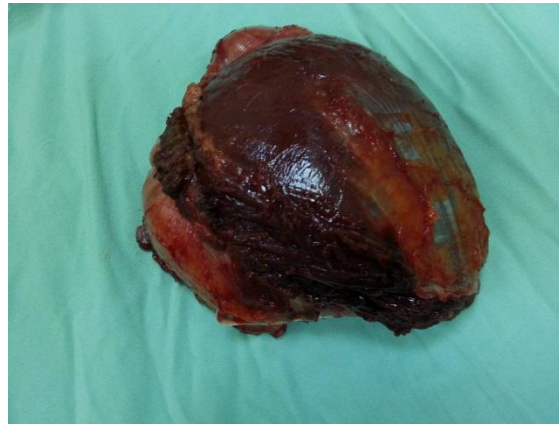
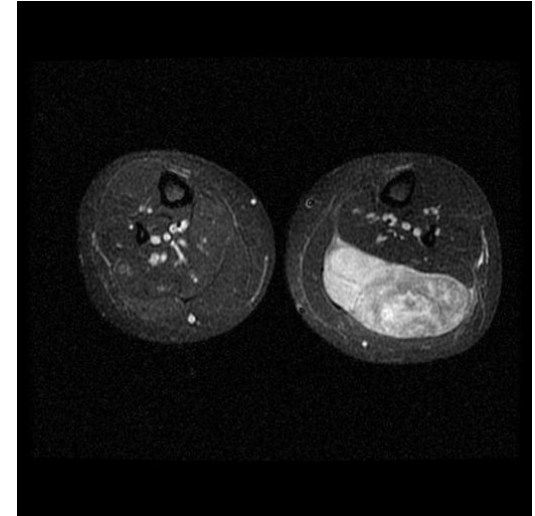
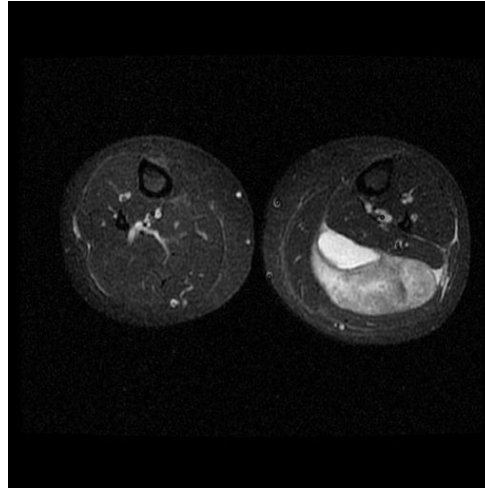
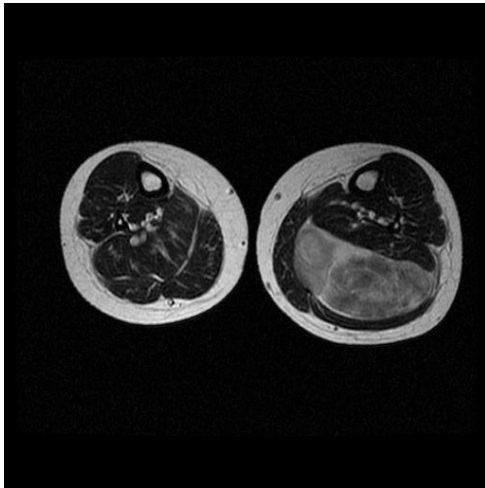
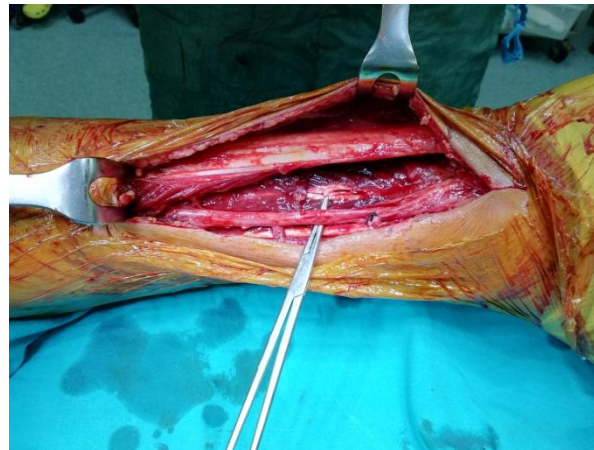
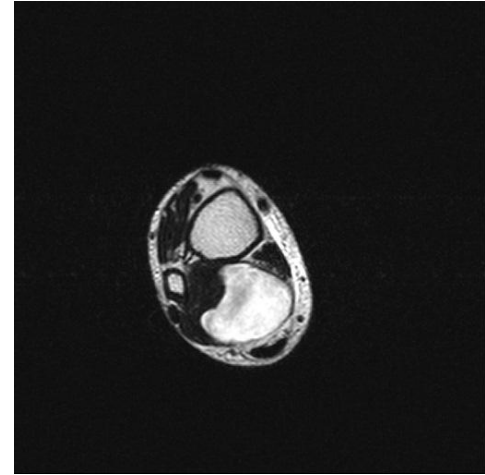
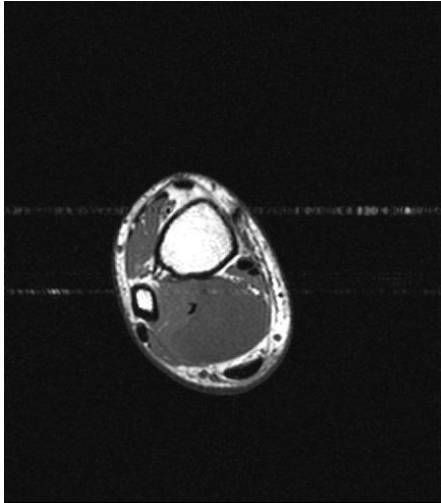


Figure 5. Dedifferentiated liposarcoma. Sagittal precontrast T1-weighted MR image (A) and axial postcontrast fat-suppressed T2-weighted MR image (B) of the lateral thigh show a bimorphic mass with lipomatous (solid arrows) and nonlipomatous composition with postcontrast enhancement of the nonlipomatous component (dotted arrows).

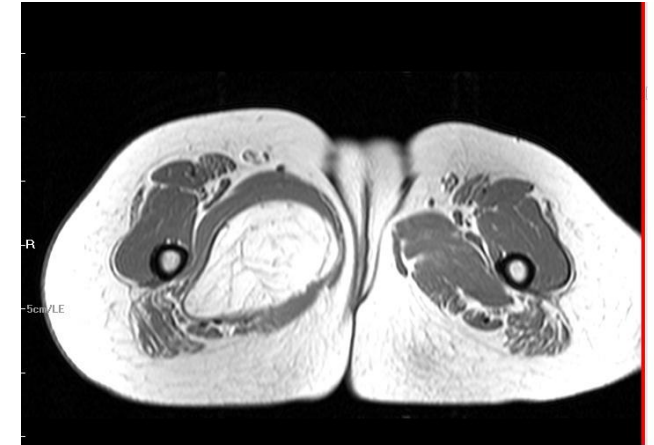
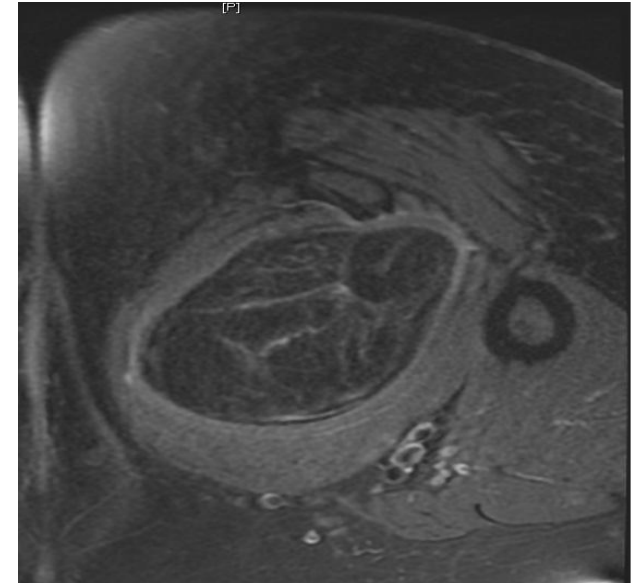
LİPOSARKOM



MİKSOİD LİPOSARKOM



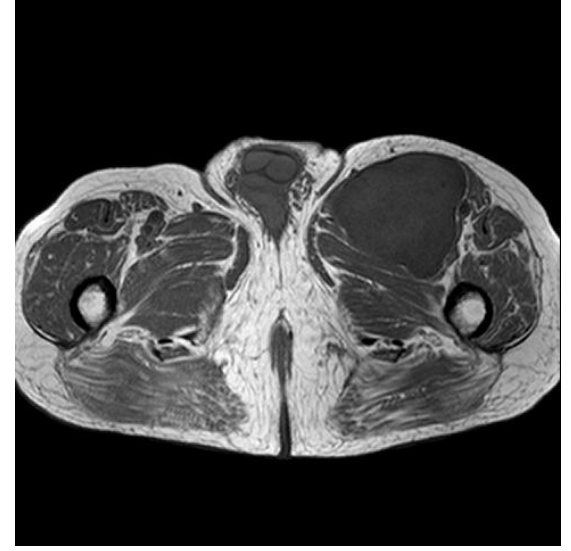
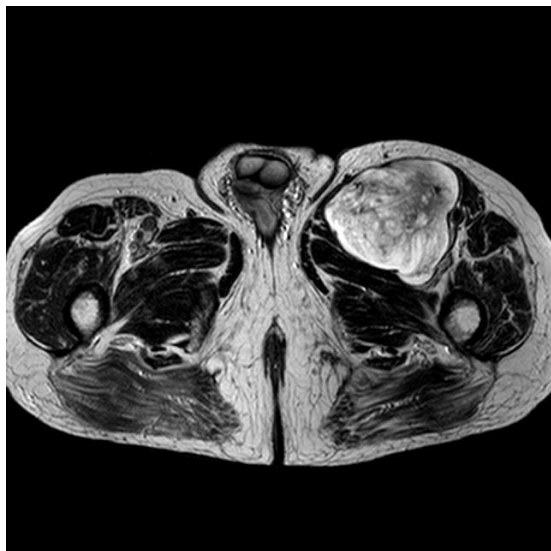
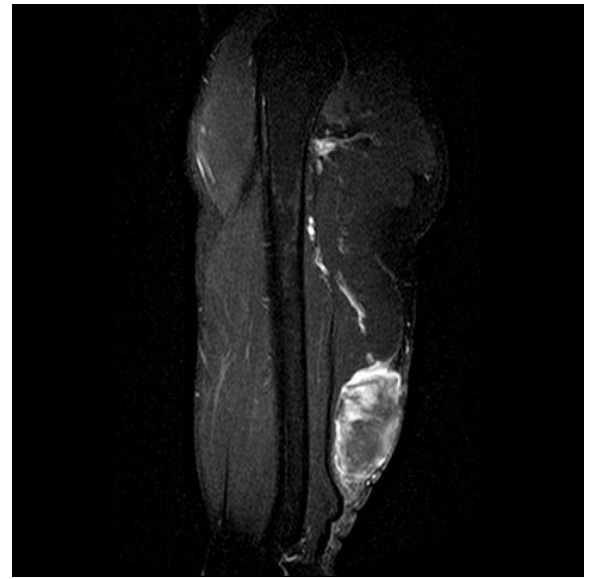
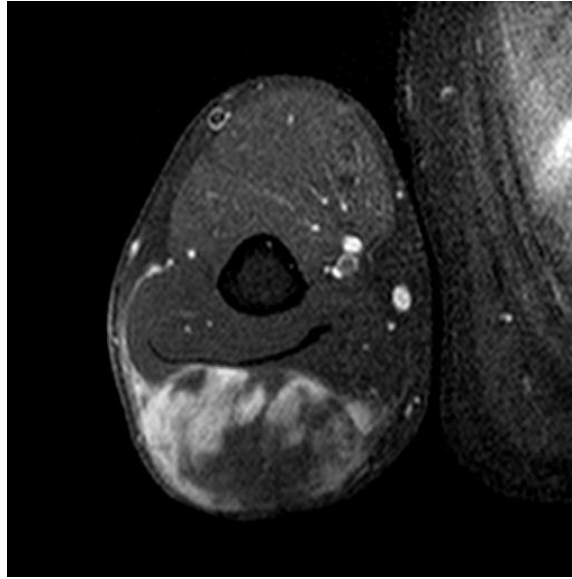
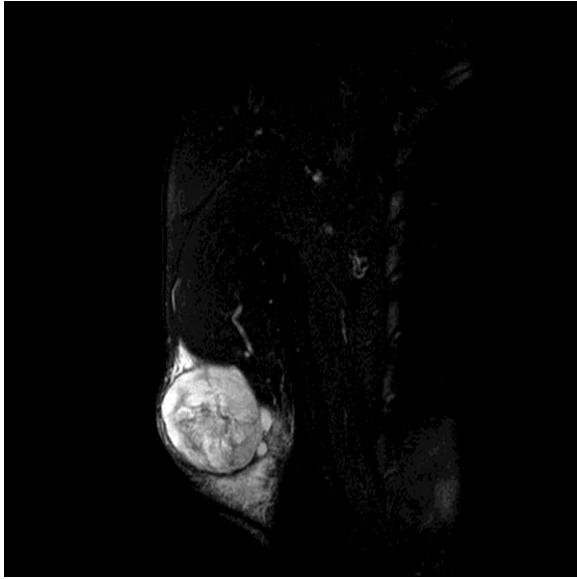
İYİ DİFERANSİYE LİPOSARKOM



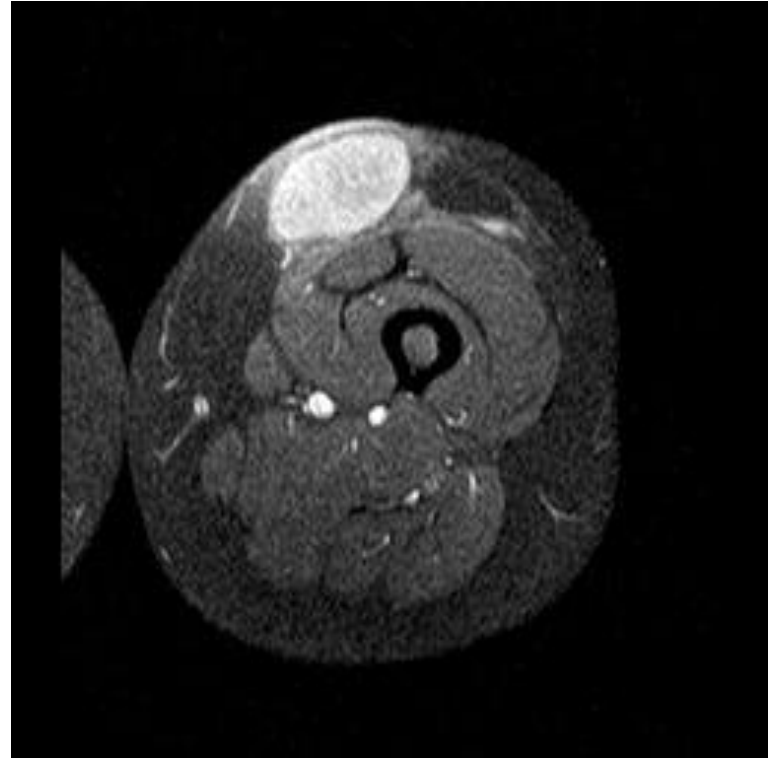
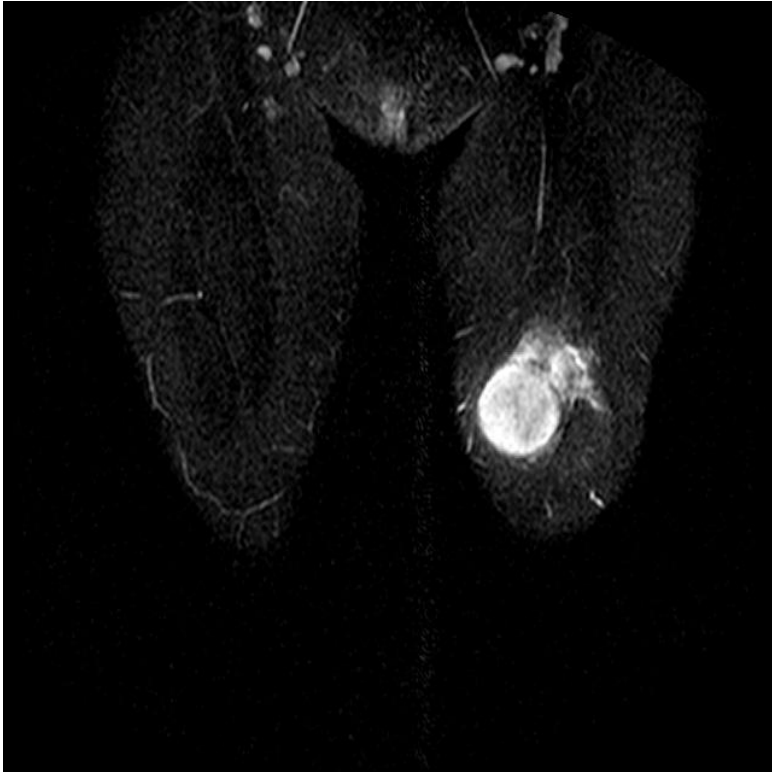
Fibrosarkom

- Nadirdir
- 30-55 yaş arası erkeklerde sık
- Yavaş büyüyen ağrısız kitle
- Uyluk ve diz çevresinde sık
- Yüzeyel tümörler cilde açılabilir
- Geniş rezeksiyon ve radyoterapi uygulanır
- Yüksek derecelilerde akciğer metastazı sık

FIBROSARKOM



FIBROSARKOM



Cruris Posterior Nüks FS

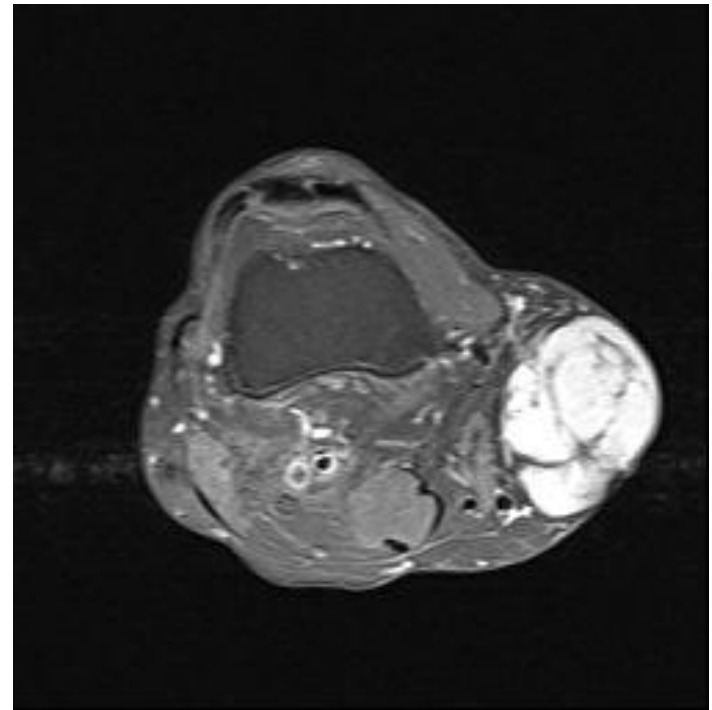
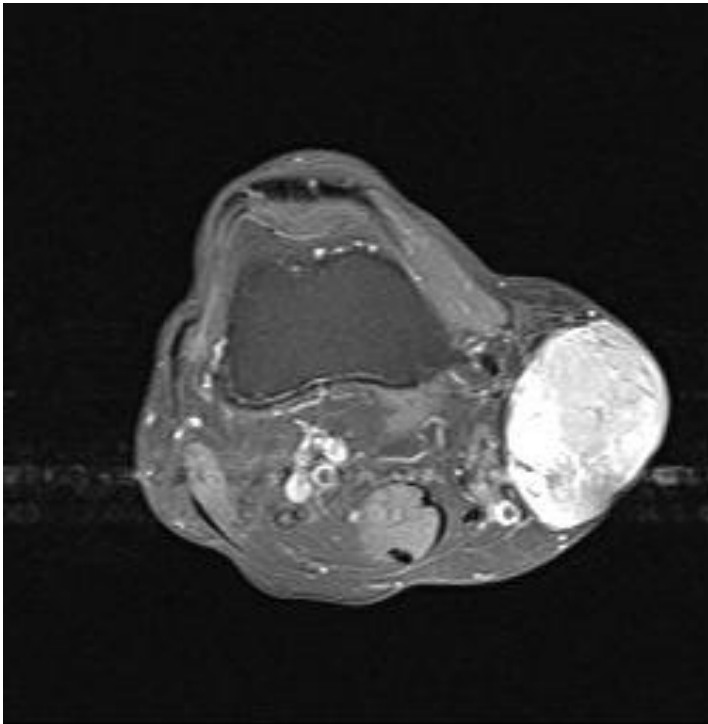
Yatak Rezeksiyonu-Serbest Flep



Dermatofibrosarkoma Protuberans

- Nadir
- Düşük dereceli
- Cilt altı yerleşimli
- %2-5 akciğer metastazı yapar
- Tekrarlamaya meyilli
- Geniş rezeksiyon uygulanmalı

Dermatofibrosarkoma Protuberans



Sinovyal Sarkom (SS)

- Genç erişkinlerin en sık kötü huylu tümörü
- 15-40 yaş erkeklerde sık
- Yavaş büyüyen, ortalama 3-5 cm boyutunda
- Uzun süreli (2-4 yıl) hikaye olabilir
- Tendon kılıfı, bursa, fasya, eklem kapsülü kaynaklı olabilir. Nadiren eklem içi
- Geniş rezeksiyon ve radyoterapi
- 5 yıllık sağ kalım %50

SINOVIAL SARKOM

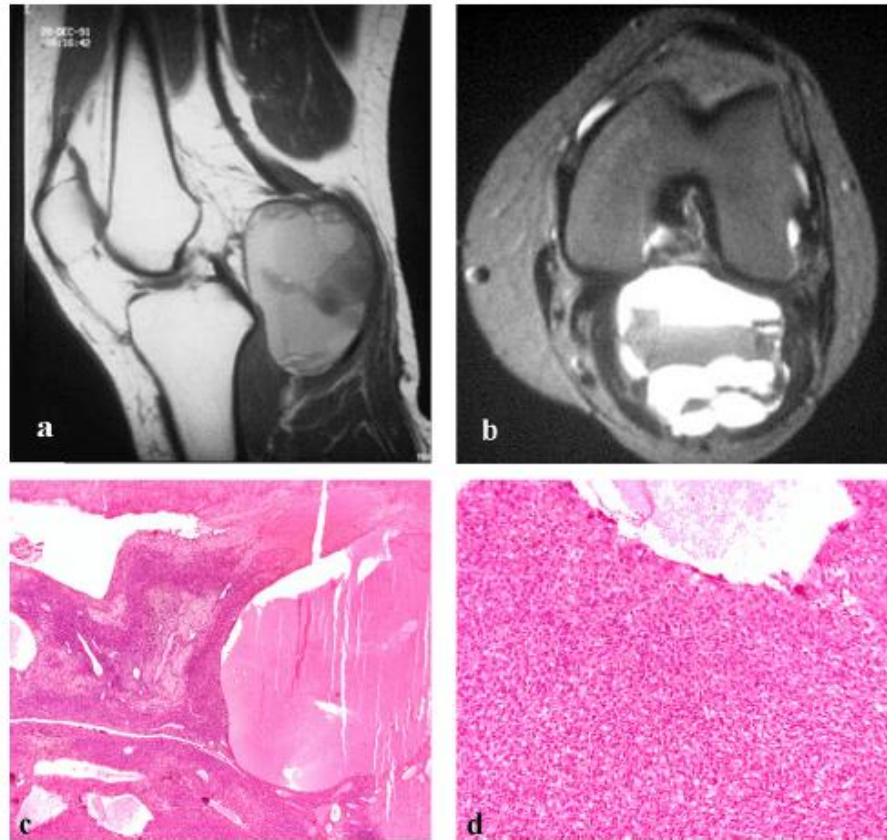


Fig. 8. Synovial sarcoma of the poplitea fossa. (a) Sagittal T1-weighted spin-echo MR: extra articular tumour with an heterogeneous signal so-called the triple sign. (b) Transverse T2-weighted spin-echo MR: lesion exhibits fluid-fluid levels characteristic of synovial sarcoma with hemorrhage. (c) Presence of cystic areas in a monophasic spindle cell synovial sarcoma. (d) Tumour composed of small, uniform spindle cells.

SNOVYAL SARKOM

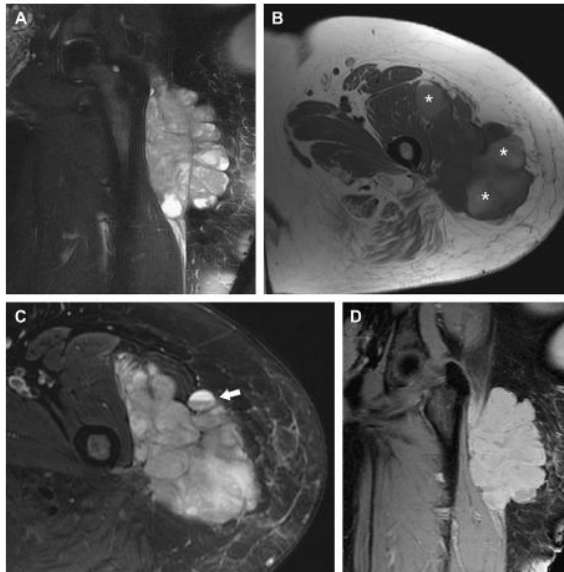


Fig. 5. Synovial sarcoma. Synovial sarcoma in a 47-year-old woman with slow-growing, painful, left lateral thigh mass. (A) Coronal fat-saturated T2W (repetition time/echo time [TR/TE], 4200/72.6), (B) axial T1W (TR/TE, 600/12), (C) axial fat-saturated T2W (TR/TE, 2800/68.1), and (D) coronal fat-saturated contrast-enhanced T1W (TR/TE, 225/1.8) MR images demonstrate a large, lobulated, heterogeneous mass centered at the iliotibial band. A combination of septations, hemorrhage (asterisks), and fluid level (arrow) account for the "bowl of grapes" appearance. Diffuse enhancement was noted in the solid components (see [D]).

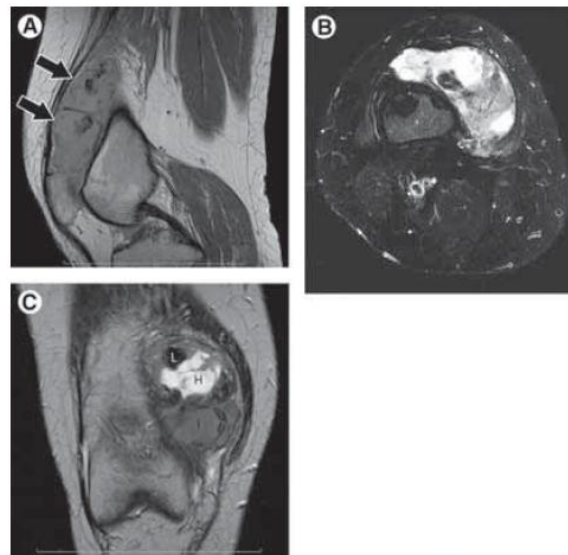


Figure 12 Synovial Sarcoma. A 42-year-old Hispanic female presents with an enlarging extraarticular mass over her superomedial right knee during 6 months. (A) Sagittal proton-density-weighted (TR/TE; 2200/25.6), (B) axial T2-weighted image with fat saturation (TR/TE; 4266.7/105.3), and (C) coronal T2-weighted (TR/TE; 4950/104.1) MR images demonstrate a large, heterogeneous lesion in the superomedial right knee with solid and cystic components. Sagittal MR image demonstrates heterogeneous lesion adjacent to the suprapatellar bursa (arrows). Coronal T2 reveals marked heterogeneity with the "triple sign," including areas of high (H), intermediate (I) and low (L) signal within the mass.

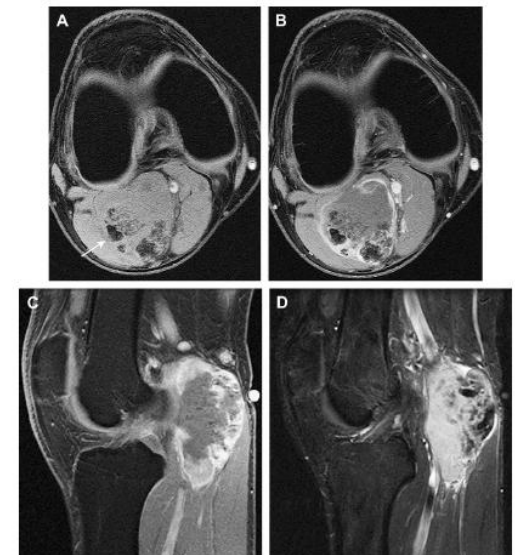


Fig. 14. Synovial sarcoma. (A) A heterogeneous mass in the popliteal fossa of a 17-year-old girl appears isointense on axial, T1-W, fast spoiled gradient-recalled echo sequence and demonstrates intense marginal enhancement on T1-W, fast spoiled gradient-recalled echo gadolinium-enhanced, axial (B) and coronal (C) sequences. Hypointense areas represent calcification (arrow in A), evident on radiographs. (D) The well-circumscribed mass appears hyperintense on sagittal inversion recovery sequences, which also demonstrate areas of hypointense calcification

Magnetic Resonance
Imaging of Malignant
Soft Tissue Neoplasms
in the Adult

SNOVYAL SARKOMA

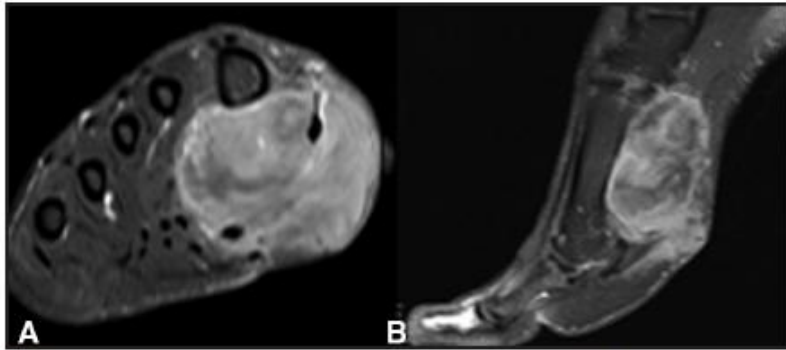


Figure 8. Synovial sarcoma. Axial (A) and sagittal (B) postcontrast T1-weighted MR images through the foot show a heterogeneously enhancing mass on the plantar aspect of the foot surrounding the flexor tendons.

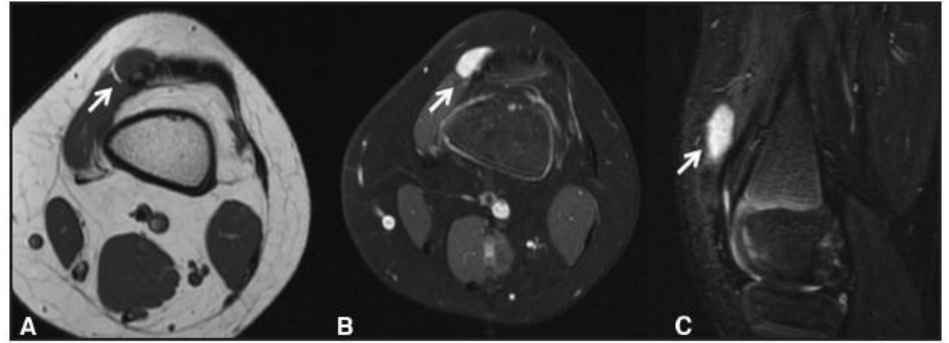


Figure 9. Synovial sarcoma. Axial T1-weighted precontrast MR image (A), axial T2-weighted fat-suppressed MR image (B), and postcontrast sagittal T1-weighted MR image (C) show a small T1 hypointense and T2 hyperintense mass (arrows) along the medial aspect of the knee with postcontrast enhancement in a skeletally immature patient.

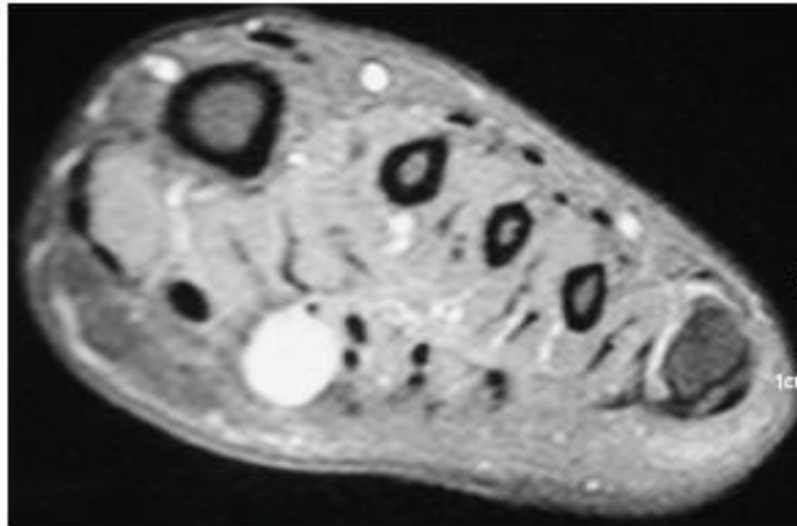
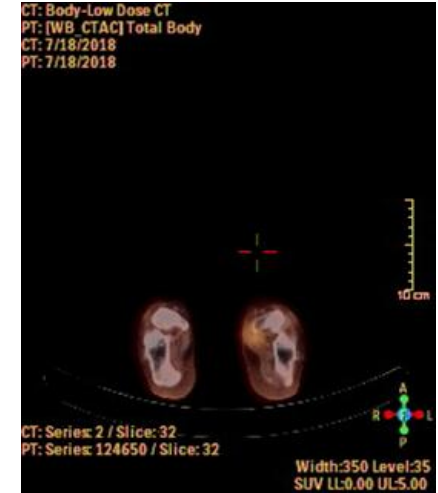
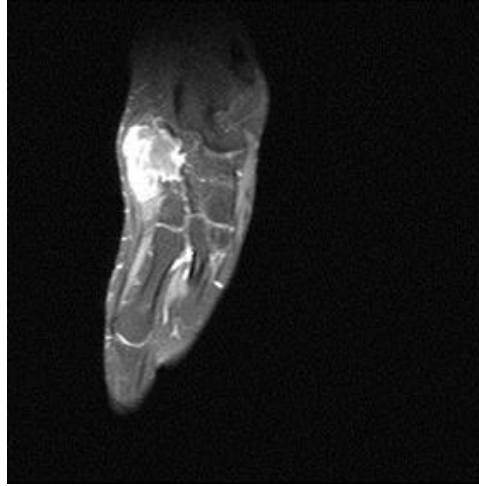
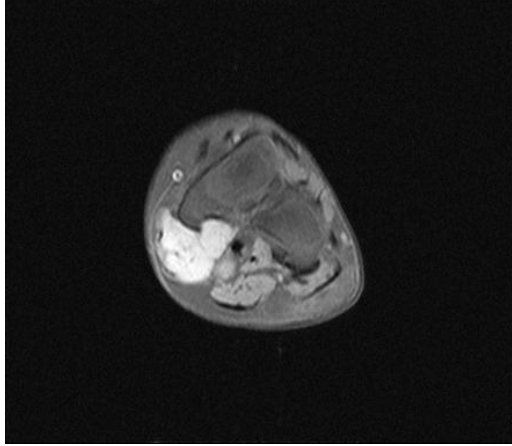


Figure 2 Axial, T2-weighted, fat saturation image of the foot demonstrating a small synovial sarcoma.

Ayak Rezidü Snovyal Sarkom Yatak Rezeksiyonu



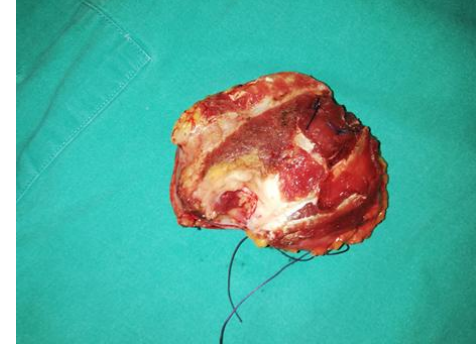
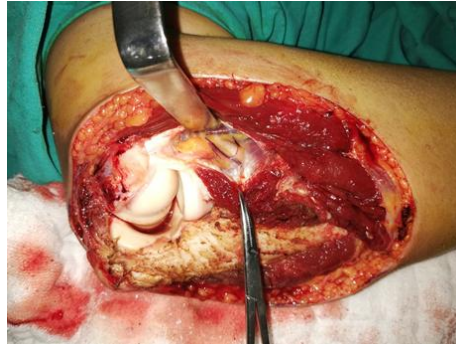
Ayak Rezidüe SS

Yatak Rezeksiyonu+V-Y Flap



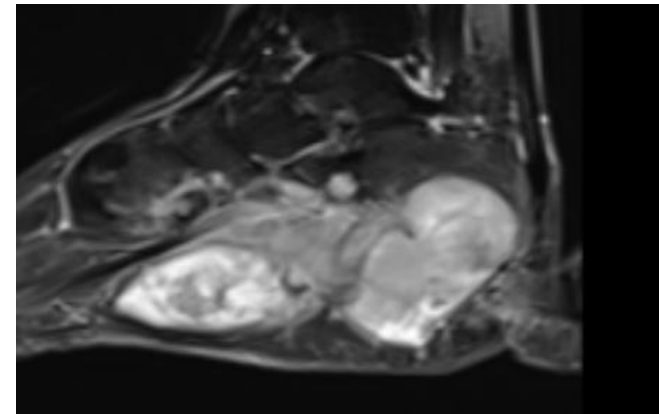
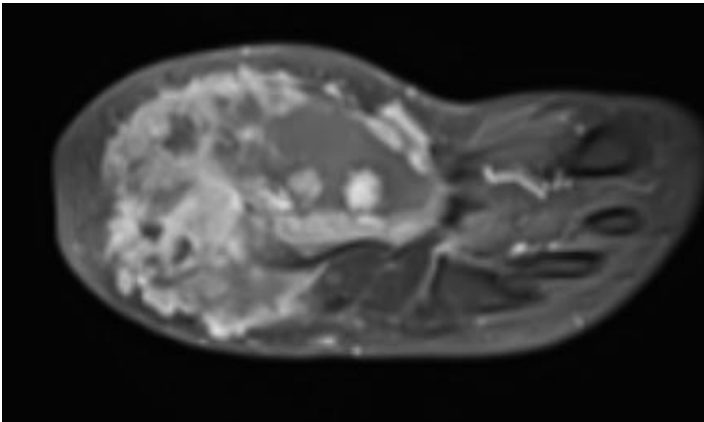
Dirsek Nüks Snovyal Sarkom

Geniş Rezeksiyon-Radial Flep



Topuk SS

Diz Altı Amputasyon



Epiteloid Sarkom

- İyi huylu tümör ile karışabilir
- 10-35 yaş arası erkeklerde
- Yavaş büyüyen, 3-6 cm boyutlu
- El ve kol yerleşimi sık
- Sert ağrısız kitle cilde açılabilir
- Derin yerleşimliler kemikte yıkıma neden olabilir
- Geniş rezeksiyon ve radyoterapi uygulanmalı
- Nüks ve metastaz olasılığı yüksek
- Beklenen yaşam süresi düşük

EPITHELOID SARKOMA

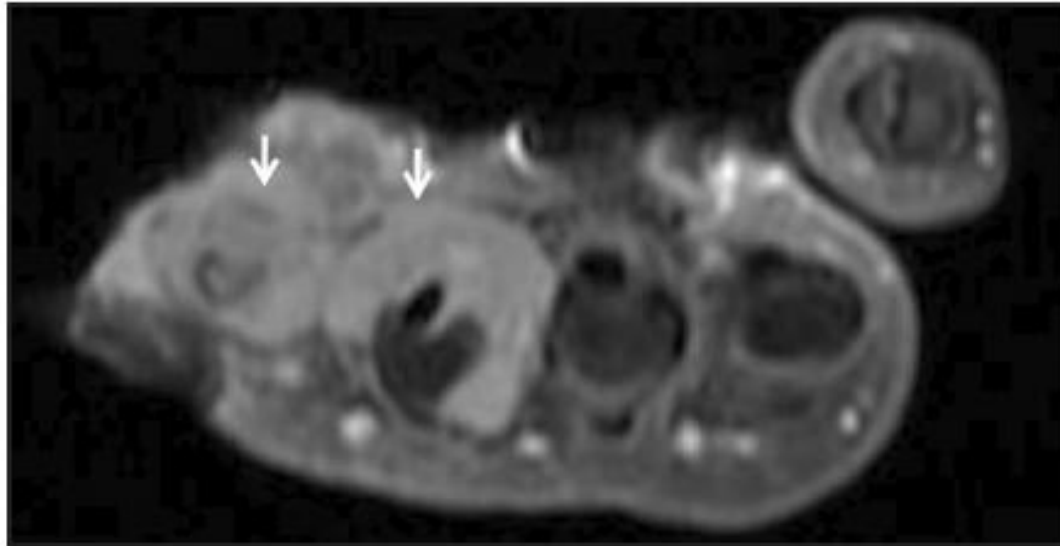


Figure 10. Epithelioid sarcoma. Postcontrast axial T1-weighted fat-suppressed MR image of the right hand shows an ulcerating palmar mass with heterogeneous enhancement surrounding the flexor tendons of the fourth and fifth digits (*arrows*).

Clear Cell Sarkom

- Nadir
- 20-40 yaş kadınlarda sık
- Derin yerleşimli ve tendonlarla ilişkili
- Ayakta görülen en sık kötü huylu tümör
- Yavaş büyüyen, 2-6 cm boyutlu
- İyi huylu tümör ile karışabilir
- Geniş rezeksiyon ve radyoterapi uygulanmalı
- Nüks ve metastaz sık

CLEAR CELL SARKOMA



Spindle cell sarcoma at left foot, plantar aspect in a male patient 17 years old
Sagittal T₁W after contrast injection (A) and sagittal T₂W (B)
The tumor had different compositions with cystic area seen as bright signal in B (←) and low signal in A



Fig. 7. Clear cell sarcoma. Clear cell sarcoma in a 20-year-old woman who noticed a bump on the plantar surface of her foot. (A) Sagittal T₁W (repetition time/echo time [TR/TE], 450/25) and (B) T₂W (TR/TE, 1800/90) images (without fat suppression) demonstrate a lesion emerging from the plantar fascia (arrows).

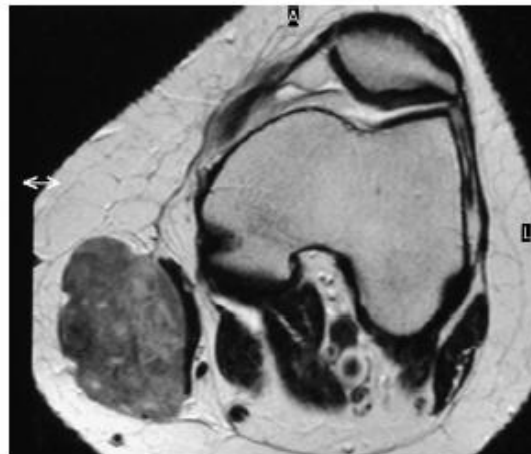
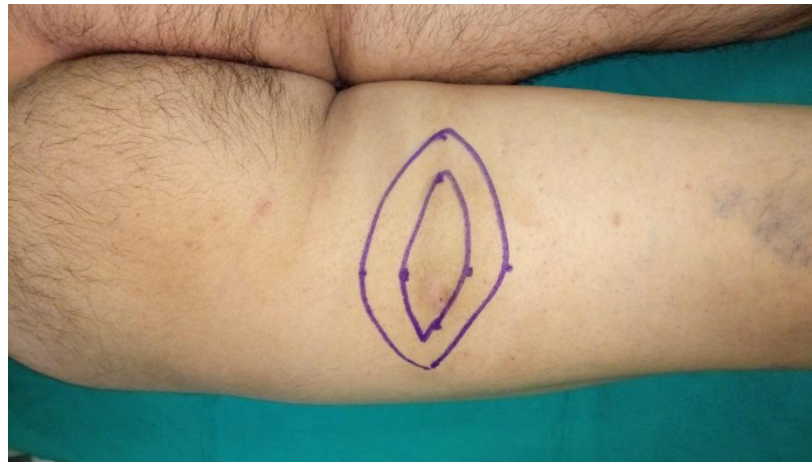
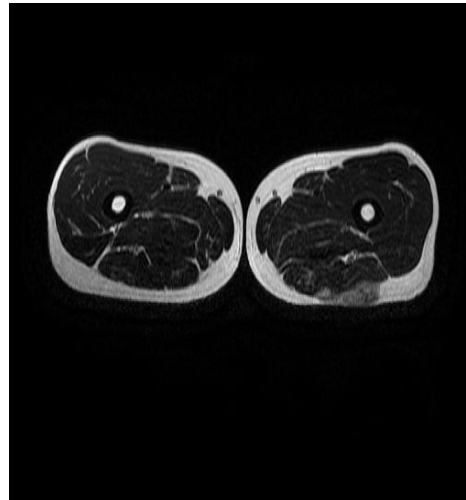
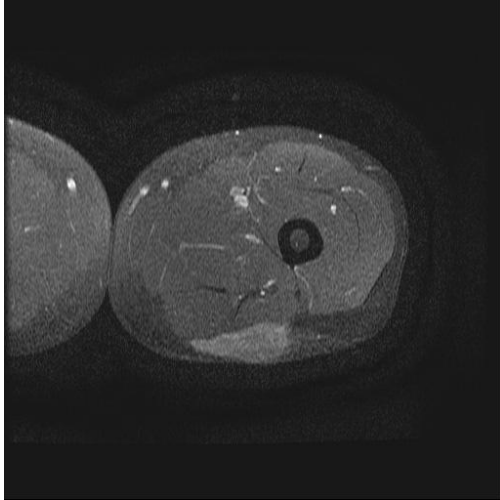
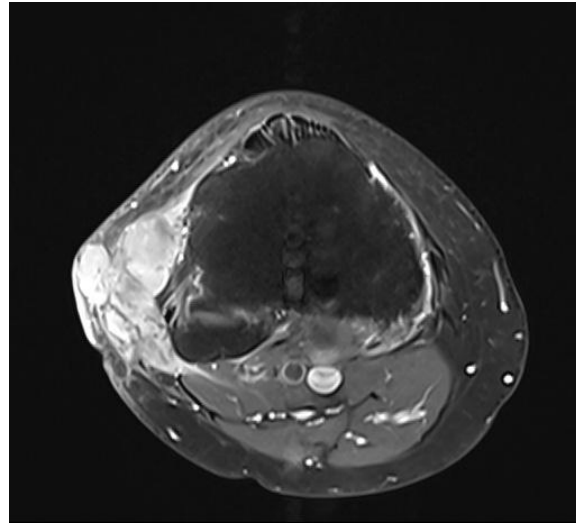
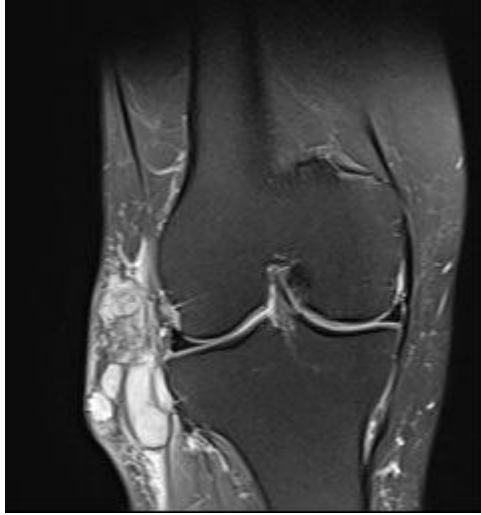


Figure 1 Axial, T₂-weighted image of the knee demonstrating a superficial spindle cell sarcoma on the medial aspect.

CLEAR CELL SARKOMA



CLEAR CELL SARCOMA



Rabdomyosarkom

- Çocukluk ve erginlikte görülen en sık kötü huylu yumuşak doku tümörü
- %50'si ilk 10 yaşta görülür
- <1 yaş ve >10 yaş kötü prognoz
- 3 tipi mevcut
 - Embriyonel tip 0-4 yaş erkeklerde sık
 - Alveolar tip: Kötü prognoz. 0-19 yaşta
 - Pleomorfik tip
- Kemoterapi sonrası geniş rezeksiyon uygulanır
- Radyoterapi uygulanabilir
- Kemik iliği metastazı yapabilir

RABDOMYOSARCOMA

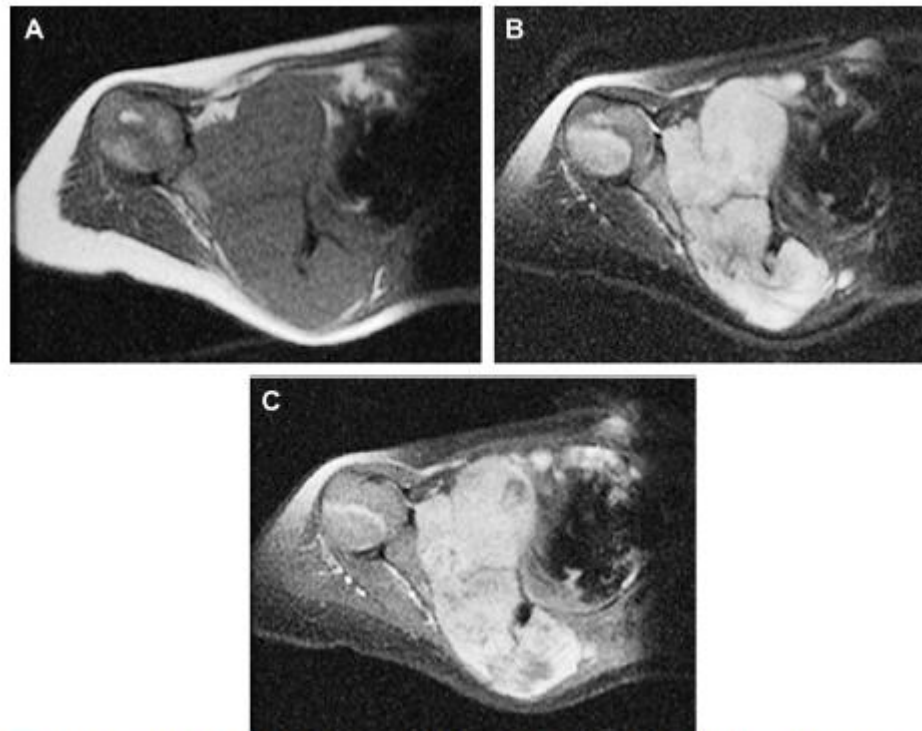
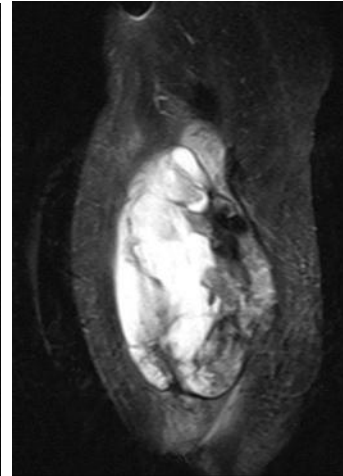
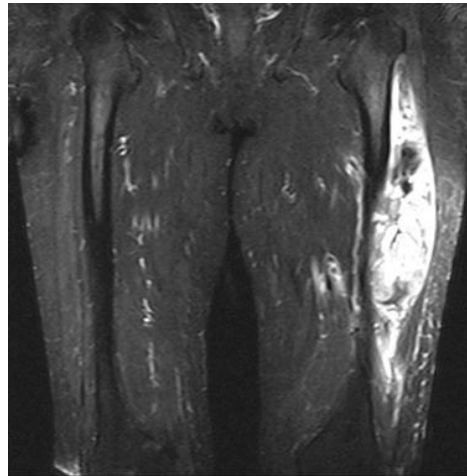
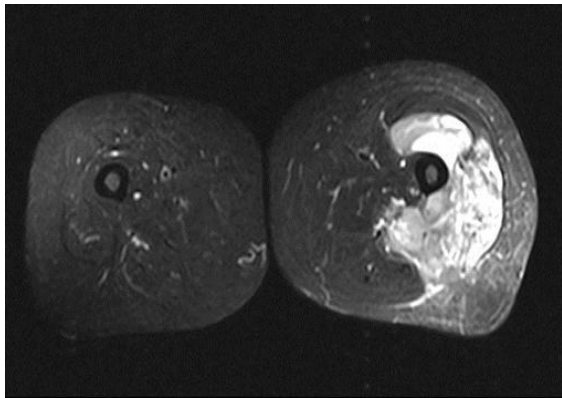
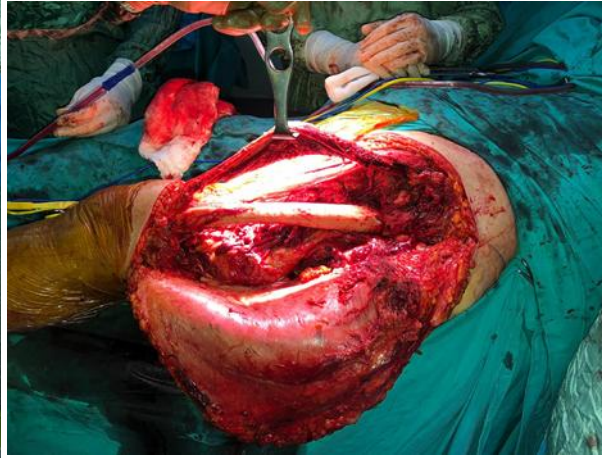
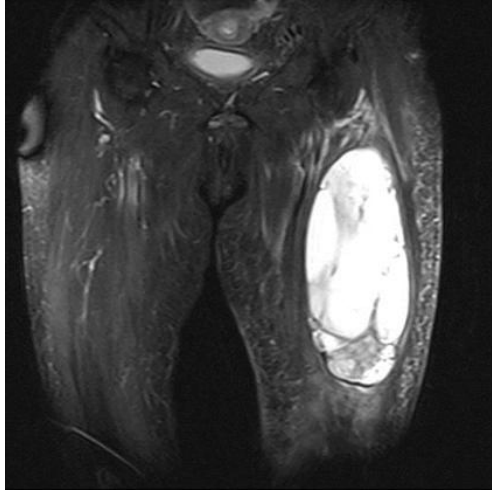


Fig. 13. Rhabdomyosarcoma. Axial views of the right shoulder demonstrate a lobulated mass that is isointense to muscle on T1-W (A), of intermediate to high intensity on T2, fast spin-echo, fat suppressed imaging (B), and that enhances intensely though heterogeneously (C). (Courtesy of Leslie Grissom, Wilmington, DE.)

Uyluk Rabdomyosarkom Geniş Rezeksiyon-İM Çivi



Malign Periferik Sinir Kılıfı Tümörü (MPNST)

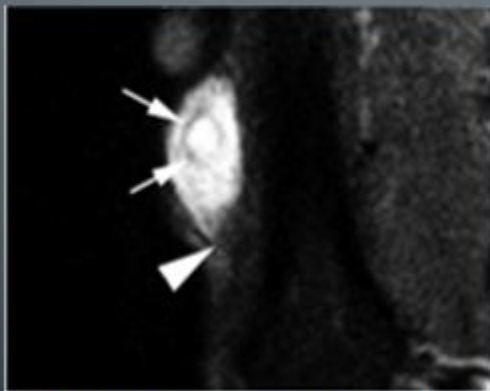
- Nörofibrosarkoma olarakta adlandırılır
- Soliter nörofibrom kaynaklılar 30-55 yaş, Tip 1 nörofibromatozis (NF1) hastalarında 20-40 yaşta görülür
- Vakaların %50'si NF1 ile ilişkilidir
- NF1 hastalarının %5'inde 10-20 yıl arasında gelişir
- Geniş rezeksiyon ve radyoterapi uygulanır

Malignant peripheral nerve sheath tumors (MPNST)

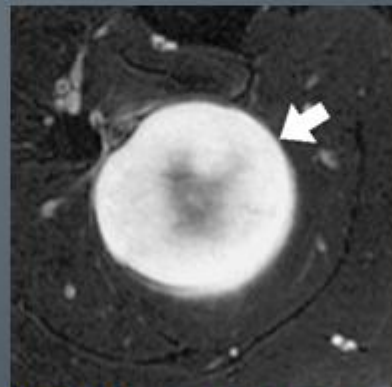
MR iyi ve kötü huylu sinir kılıfı tümörü ayırımında kullanılabilir

MRI CHARACTERISTICS OF BENIGN AND MALIGNANT PERIPHERAL NERVE SHEATH TUMORS

CHARACTERISTIC	BPNST	MPNST
Fusiform shape with tapered ends	Present	Present
Oriented longitudinally along direction of peripheral nerve	Present	Present
Fascicular sign: multiple ring-like structures with peripheral hyperintensity on T2 weighted MR	Present	Absent
Target sign: hyperintense periphery surrounding a hypointense center on T2 weighted MR	Present	Absent
Split-fat sign: rim of fat surrounding the neurovascular bundle (and lesion) on T1 weighted MR	Present	Absent



Fascicular sign. (T2-MR) A hypointense ring (arrows) within an otherwise hyperintense benign plexiform neurofibroma.



Target sign. (T2-MR) A hypointense center with a hyperintense periphery in a benign plexiform neurofibroma of the tibial nerve.



Split-fat sign. (T1 MR) A rim of fat (arrow heads) surrounds the neurovascular bundle in which a benign Schwannoma (large arrow) has formed.

SCHWANNOMA

MALİGN PERİFERİK SİNİR KILIFI TÜMÖRÜ

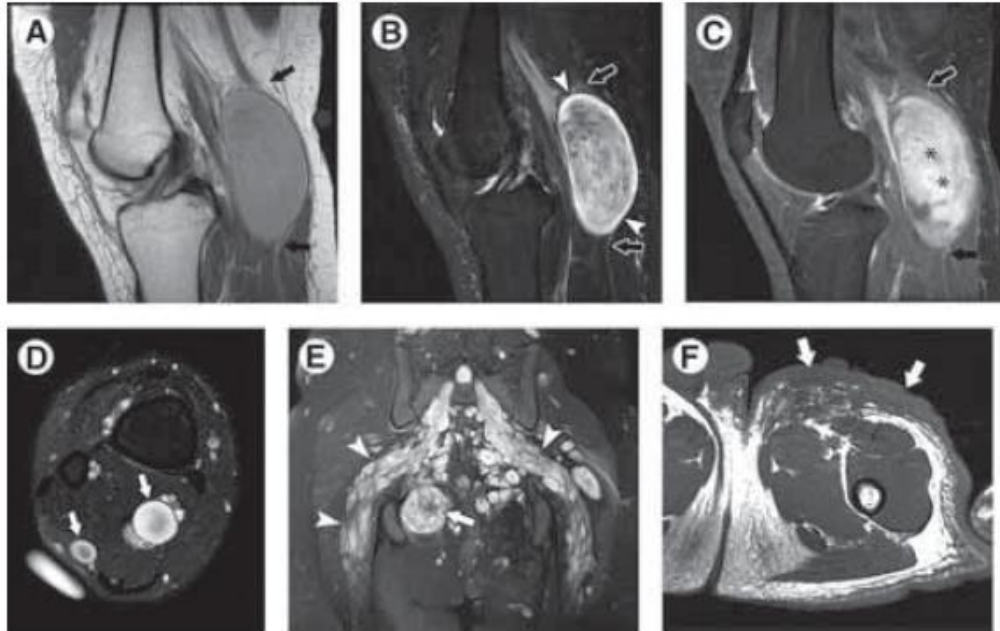


Figure 10 Neural lesions. A 31-year-old woman with popliteal mass enlarging and becoming painful. (A) Sagittal proton density (TR/TE; 1700/25), (B) T2-weighted fat saturation (TR/TE; 4889/70) and (C) T1-weighted fat saturation postcontrast images (TR/TE; 560/10) demonstrate an eccentrically entering and exiting nerve (arrows) consistent with schwannoma. Higher T2 signal intensity is noted in the periphery (arrowheads) and avid central enhancement (*). (D) Axial T2-weighted image with fat saturation (TR/TE; 4889/70) in a 16-year-old male with calf mass demonstrates 2 lesions with high T2 signal in the lesion periphery secondary to myxoid region (target sign) (arrows). An 18-year-old female with a history of neurofibromatosis type I. (E) Coronal T2-weighted fat saturation sequence (TR/TE; 4889/70) with plexiform neurofibroma of the sciatic nerves (arrowheads). These can be described as ropelike or moniliform. Note the central necrosis (arrow) of the MPNST in the upper right thigh. A 64-year-old man with neurofibromatosis and diffuse neurofibroma involving the skin of the anterior left thigh. (F) Axial T1-weighted image (TR/TE; 425/07) demonstrates replacement of the subcutaneous fat with diffuse intermediate signal lesion (arrows).

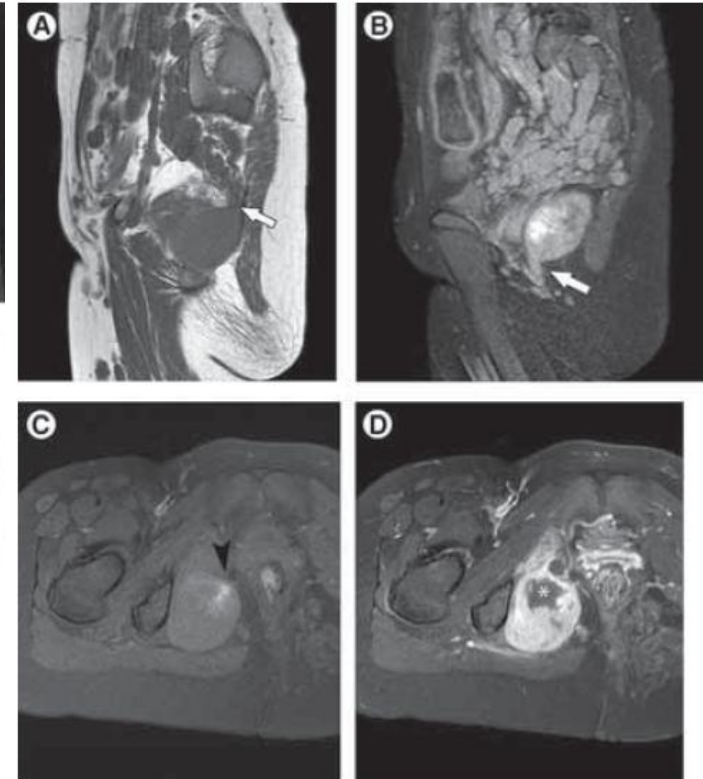
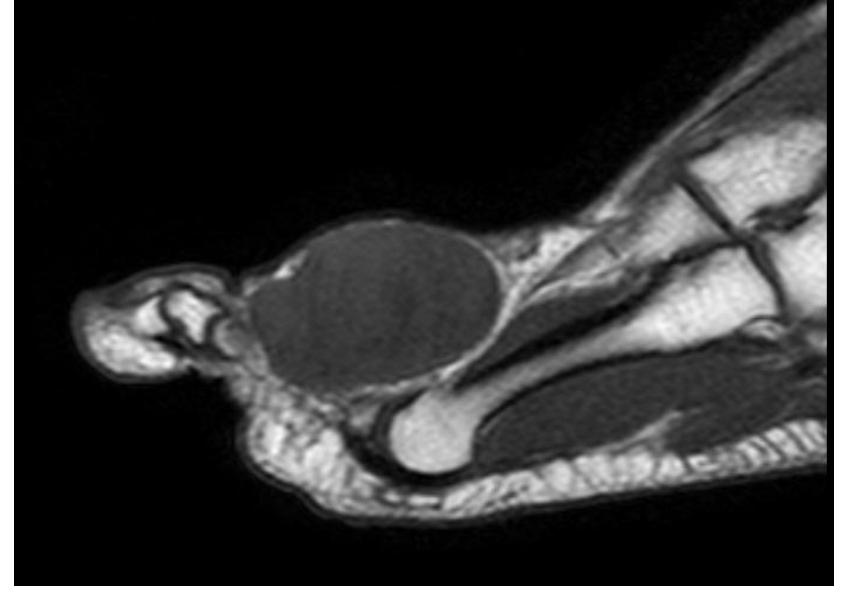
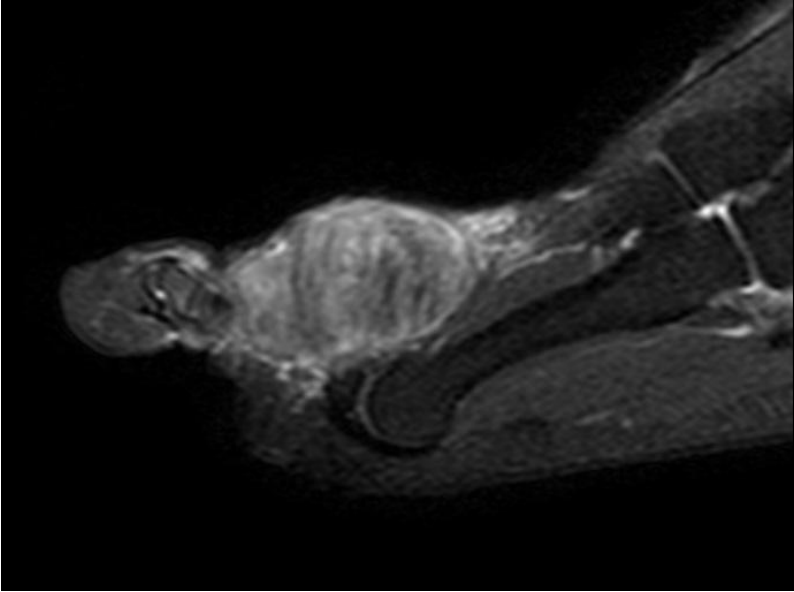
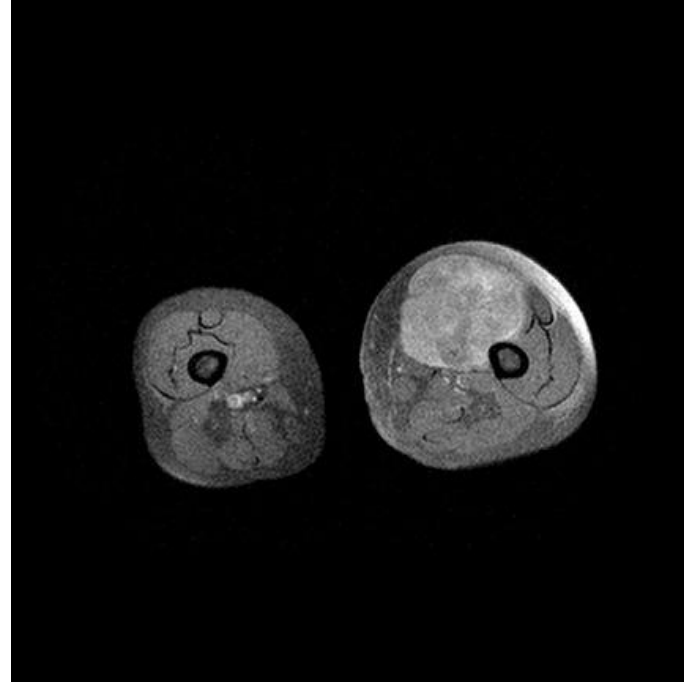
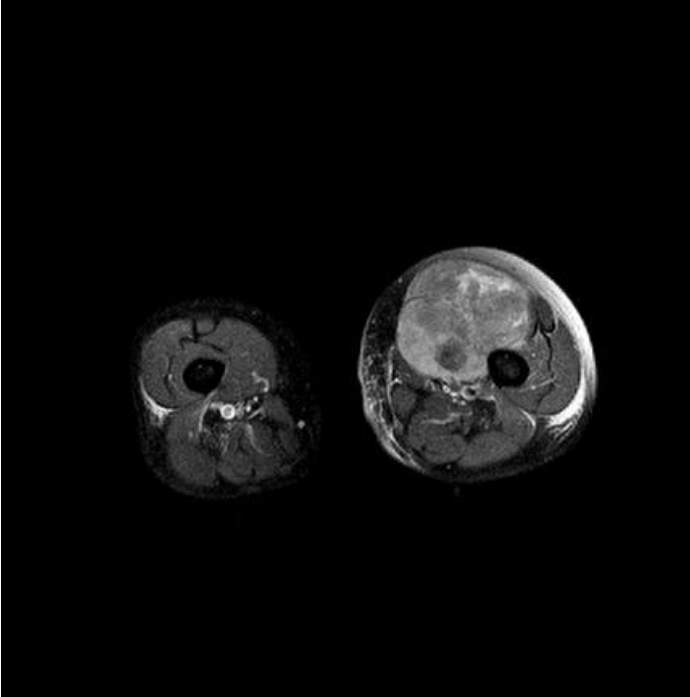


Figure 11 Malignant Peripheral Nerve Sheath Tumor (MPNST). An 18-year-old female with history of neurofibromatosis type I and pain in the right groin. Prior MPNST was resected from the calf 4 years prior. (A) Sagittal T1-weighted (TR/TE; 548/12) and (B) Sagittal T2-weighted with fat saturation (TR/TE; 1500/15) images demonstrate a heterogeneous intermuscular lesion with entering and exiting nerves (arrows). Axial T1-weighted fat saturation (C) pre and (D) postcontrast images (TR/TE; 566/12) reveals a large lesion with hemorrhage (arrowhead) and central necrosis (*).

MALİGN PRİFERİK SİNİR KILIFI TÜMÖRÜ

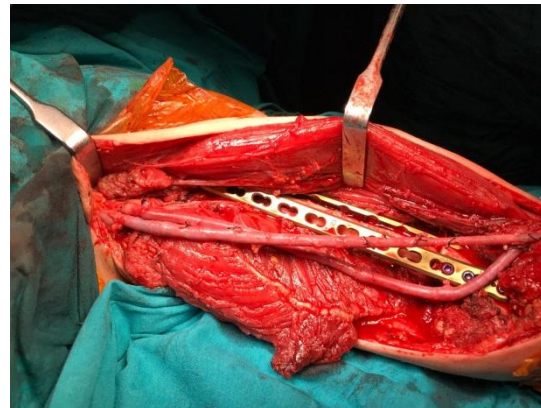
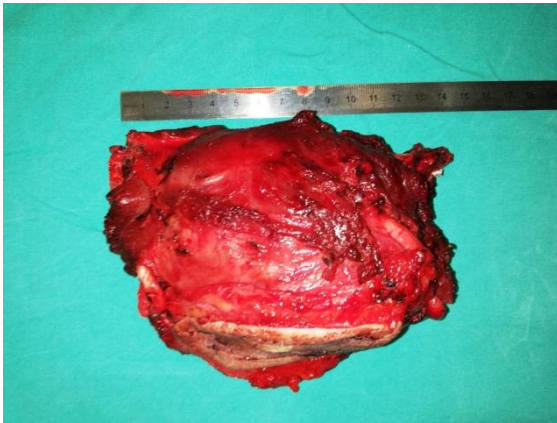


MALİGN PERİFERİK SİNİR KILIFI TÜMÖRÜ



Kol MPSKT

Rezeksiyon+A-V Graft



Leiomyosarkoma

- Nadir görülür
- Düz kas kaynaklıdır
- Genellikle derin (batın, uterus) yerleşimlidir
- Damar duvarı ve ciltten kaynaklanabilir
- Geniş rezeksiyon ve radyoterapi uygulanır

LEIOMYOSARKOMA

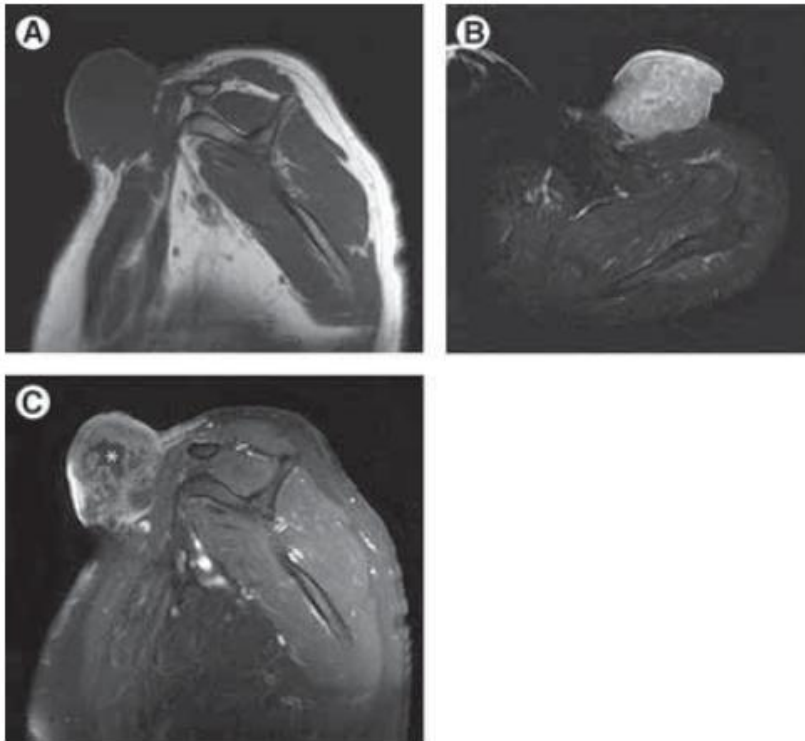


Figure 16 Leiomyosarcoma. A 57-year-old man with 1-yr history of enlarging supraclavicular soft tissue mass with subcutaneous location and protuberant morphology. (A) Sagittal T1-weighted (TR/TE; 400/16) and (B) axial T2-weighted image with fat saturation (TR/TE; 3000/70) demonstrate a large, heterogeneous lesion with intermediate signal. (C) Sagittal T1-weighted image with fat saturation post gadolinium (TR/TE; 400/16) shows intense heterogeneous enhancement with prominent central nonenhancing area (*).

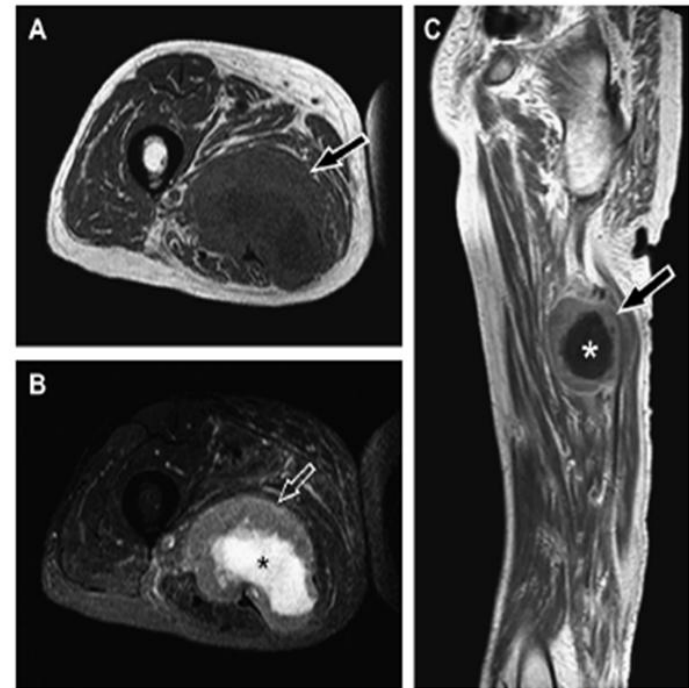
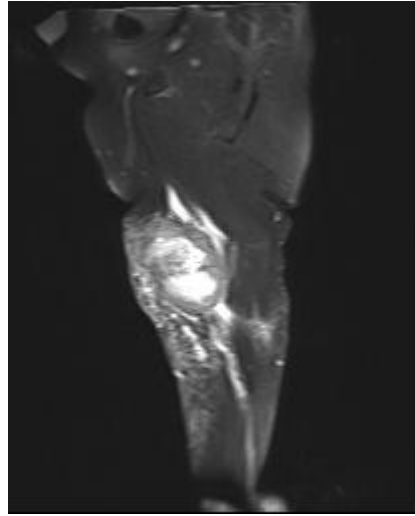
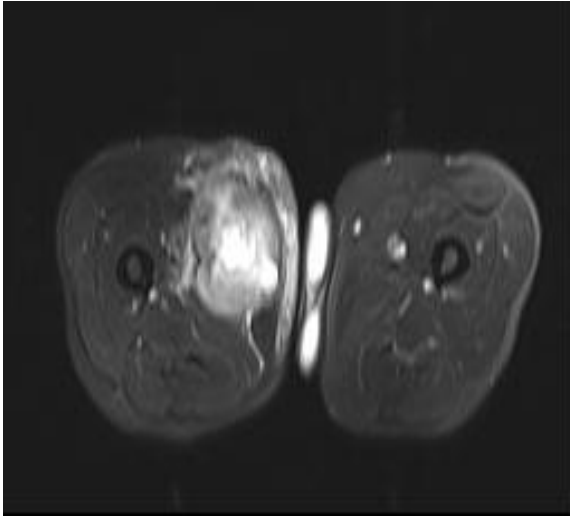


Fig. 9. Leiomyosarcoma. Leiomyosarcoma in a 77-year-old man who noticed pain in his right thigh region and experienced a 9.07-kg weight loss over several months. (A) Axial T1W image (repetition time/echo time [TR/TE], 544/7) and (B) axial T2W image with fat saturation (TR/TE, 2500/80) demonstrate a large heterogeneous lesion with intermediate signal (arrows) and central necrosis (asterisk). (C) Sagittal T1W image after gadolinium enhancement (TR/TE, 505/7) reveals thickened and irregular peripheral enhancing walls with a prominent central nonenhancing area (asterisk).

LEIOMYOSARKOM

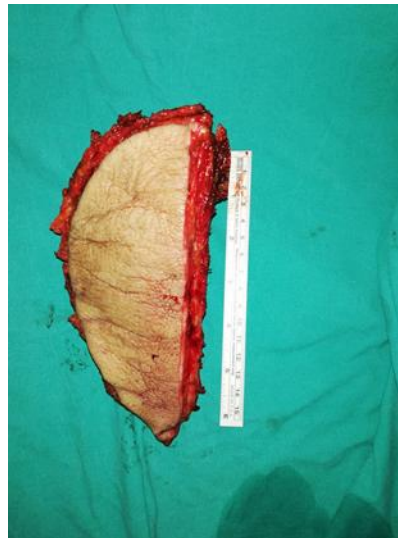
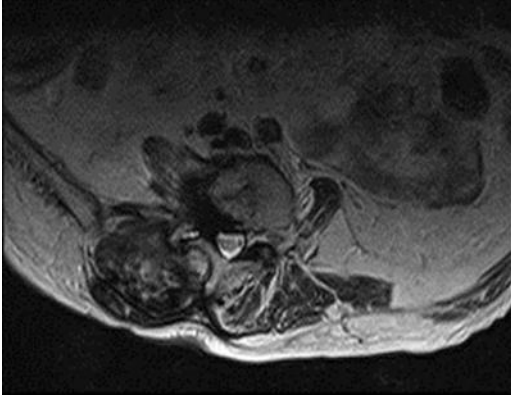


Ayak bileği Posterior LS Rezeksiyon-Rotasyonel Flep



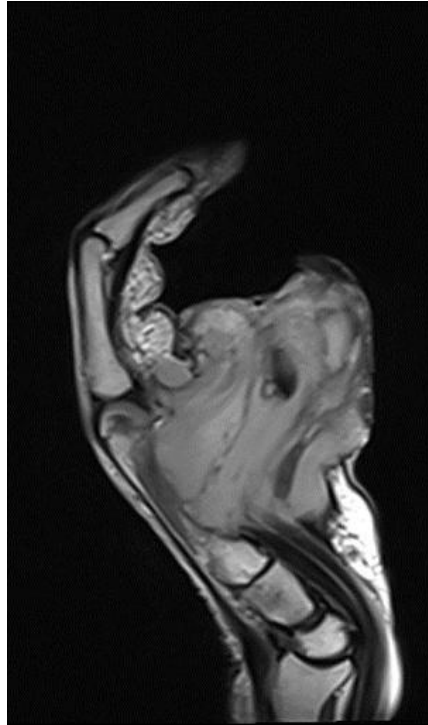
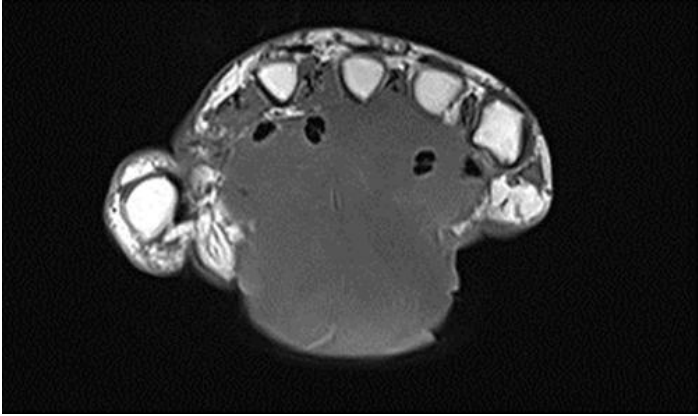
Lomber Bölge Leiomyosarkom

Geniş Rezeksiyon-Rotasyonel Flep



El Leiomyosarkom

Distal Ön Kol Amputasyon



Kötü Huylu Yumuşak Doku Tümörleri

TEŞEKKÜRLER

Doç. Dr. Seyit Ali Gümüştas