Practical Approach to Soft Tissue Masses

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1

Faculty Disclosure

- *I have nothing to disclose.*

2

Learning Objectives

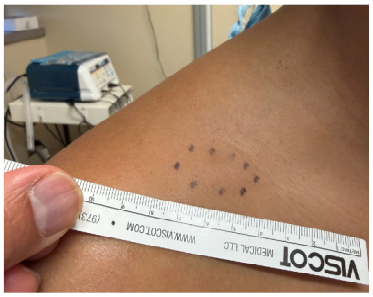
By the end of this session, participants will be able to:

- Differentiate common benign soft tissue masses, such as lipomas, ganglion and epidermal inclusion cysts, from higher-risk lesions using clinical features and "yellow flag" criteria.
- Select appropriate diagnostic strategies, including physical exam findings and the role of imaging (especially point-of-care ultrasound), to guide safe evaluation and identify when biopsy or pathologic confirmation is indicated.
- Implement evidence-based management of soft tissue masses, including conservative treatment, surgical interventions, and subspecialty referral when appropriate.

3

Case 1

- 52 yo, healthy, FH sarcoid
- Asymptomatic, stable, right supraclavicular soft tissue mass x 1yr
- Exam: 2.5 x 1.0 cm soft (doughy), mobile subcutaneous (subQ) nodule; no skin changes



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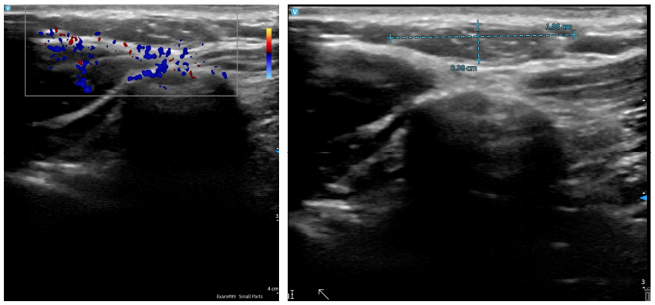

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Soft tissue masses: "Yellow flag" features (*SOR C*)

Clinical
- Sudden presentation
- Rapid growth
- >5cm
- Firm, deep, adherent

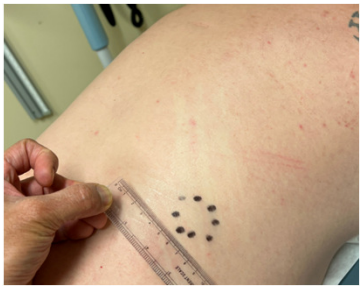
Sonographic
- >5cm
- Deep (subfascial)

Am Fam Physician. 2022; 105(6): 602-612.

6

Case 2

- 52 yo, with controlled HTN
- Asymptomatic right flank soft tissue mass >10 y
- Recent eye trauma requires sleeping on his back – mass causes back pain
- Exam: 4 x 4 cm soft (doughy), mobile subQ nodule, no skin changes



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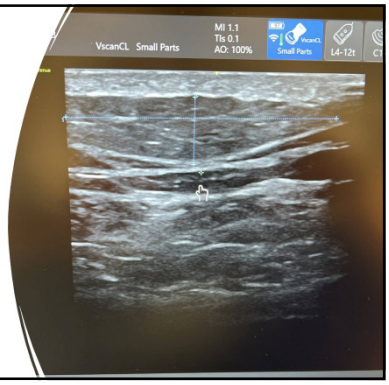
POCUS

- 3.5 x 0.9 cm superficial, discrete, isoechoic subQ mass
- No internal doppler flow
- No posterior acoustic enhancement



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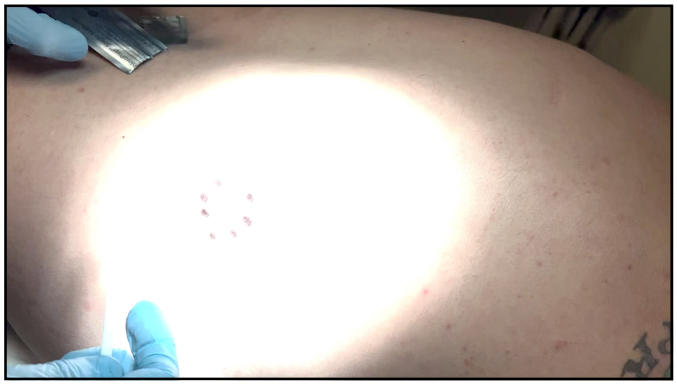
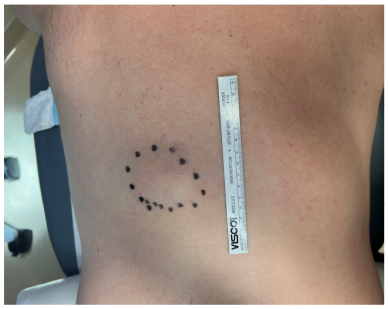


9

Case 3

- 55 yo, with HTN, GERD, BMI 29
- Symptomatic, slowly enlarging, left mid-back (thoracic) nodule x 15y
- Exam: 7 x 6 cm firm, mobile subQ nodule, no skin changes



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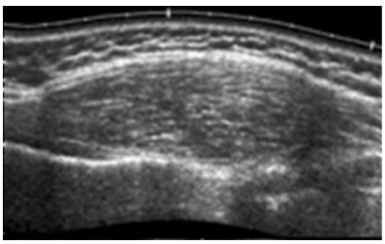
POCUS

- discrete, isoechoic mass
- Fine, internal echo pattern
- No internal doppler flow
- No posterior acoustic enhancement



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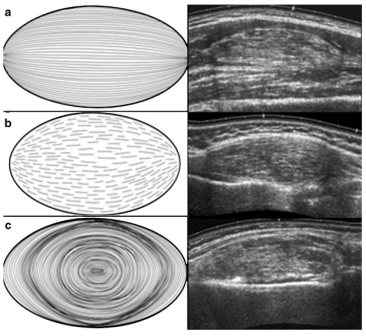
Deep-seated lipoma sonographic features



Insights Imaging. 2010 Jul;1(3):149-153.

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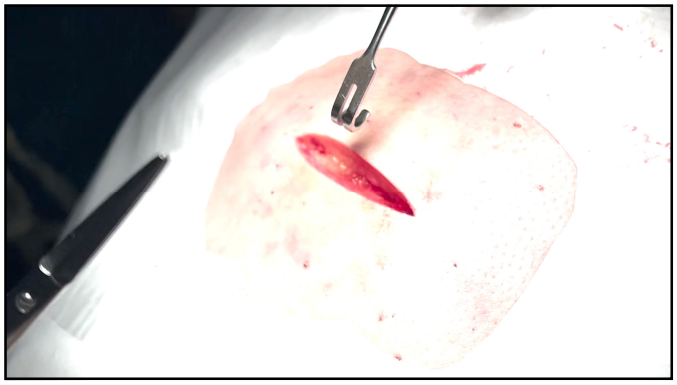


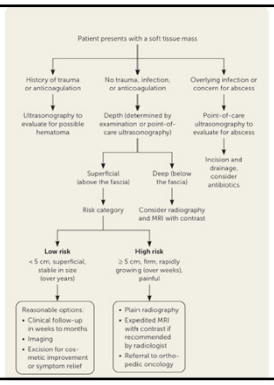
13

Soft Tissue Excision Resources

Notes,
Billing,
Handouts,
Instruments

14

Approach to Soft Tissue Masses



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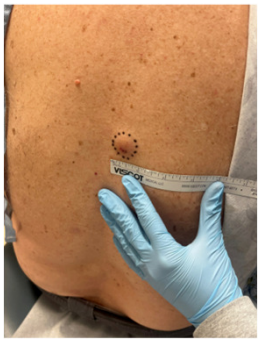
15

Case 4

- 78 yo, w/ HTN, OSA, CVA
- Painful, inflamed skin nodule of mid-back x 2wks, w/ white-yellowish cheesy drainage
- Exam: 2 x 2 cm tender, erythematous nodule/cyst, with puncta



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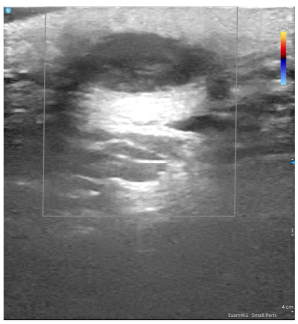

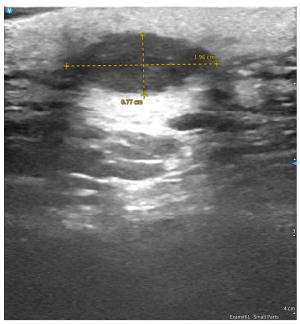

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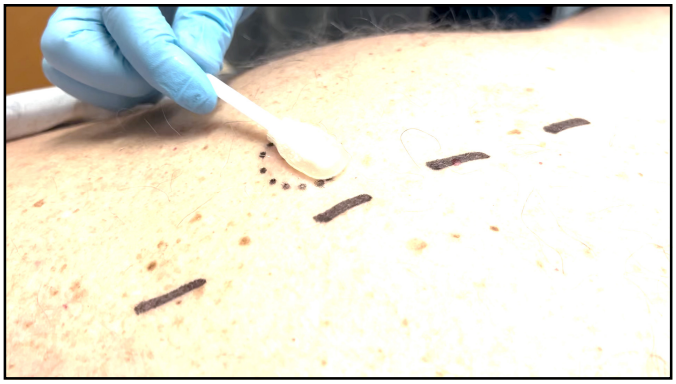


18

Epidermal Inclusion Cyst (EIC)

Cutaneous cysts:

- Epidermoid (epidermal inclusion) cyst = infundibular (follicular) cyst
- Pilar (trichilemmal) cyst
- Dermoid cyst
- Steatocystoma
- Eruptive vellus hair cyst
- Hybrid cysts

Inflamed EIC (management)

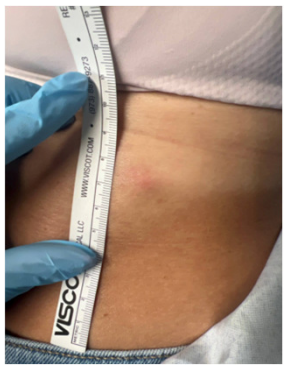
- Supportive or expectant mx – *SOR C*
- Incision & Drainage (I&D) – *SOR C*
  - *Wound culture, if indicated* – *SOR C*
  - No packing (small cysts) – *SOR B*
- Antibiotics – *SOR C*
  - Infected vs inflamed
  - 84% FM, 94% Derm choose abx
  - Doxycycline – anti-inflammatory
- Corticosteroid intralesional injection (ILI) – *SOR C*

Clin Infect Dis. 2014 Jul 15;59(2):e10-52.
Langenbecks Arch Surg. 2021 Jun;406(4):981-991.
J Drugs Dermatol. 2021 Feb 1;20(2):199-202.
J Am Acad Dermatol. 2018 Jun;78(6):e149-e150.
J Cutan Med Surg. 2006 Mar-Apr;10(2):79-84.

19

Case 5

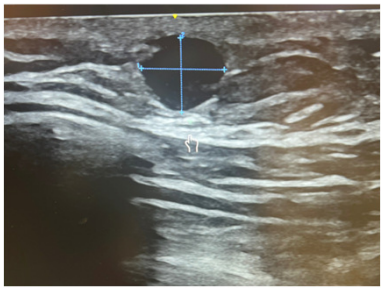
- 44 yo, with acne, GERD, w/ *fear of needles*
- SubQ nodule of left costal margin x 1mo; bigger & painful x 1wk (up to size of quarter); pain now improving; no drainage
- Exam: 1cm firm, pink, mildly tender subQ nodule; no fluctuance



20

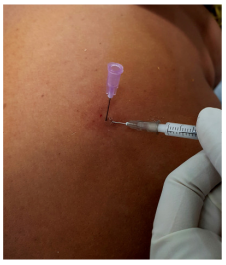
POCUS

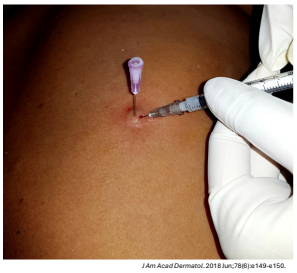
- 0.7 x 0.6 cm discrete, hypoechoic mass, w/ mild border asymmetry, mild perilesional soft tissue changes
- Posterior acoustic enhancement
- No internal doppler flow
- Treatment: doxy 100mg BID x 2 wks



21

Intralesional drainage injection





J Am Acad Dermatol. 2018 Jun;78(6):e149-e150.

22

Noninflamed EICs

- Management
  - Expectant mx
  - Intervention / surgery
- Indications of Intervention
  - Recurrent inflammation or infection
  - Symptomatic
  - Functional impairment
  - Growth, large size
  - Cosmetic impairment
- Surgical Interventions
  - Punch excision – *SOR B*
  - Minimal excision using linear approach – *SOR B*
  - Narrow elliptical technique – *SOR C*
  - Wide elliptical technique – *SOR B*

Dermatol Surg. 2006 Apr;32(4):520-5.
J Am Acad Dermatol. 2018 Aug;79(2):360-361.
Am Fam Physician. 2002;65(7):1409-1412.

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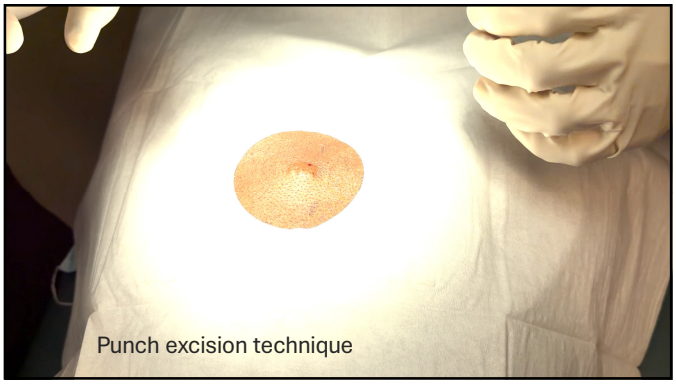

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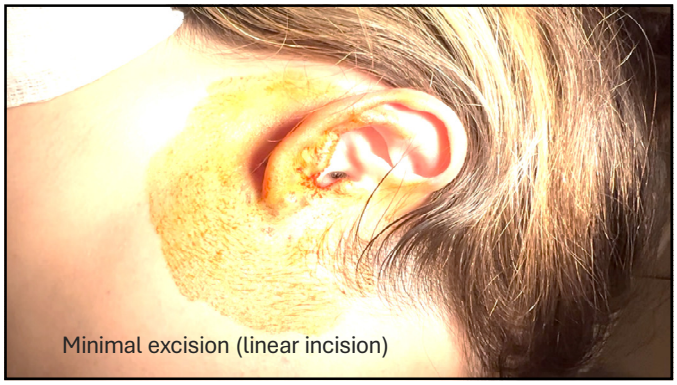

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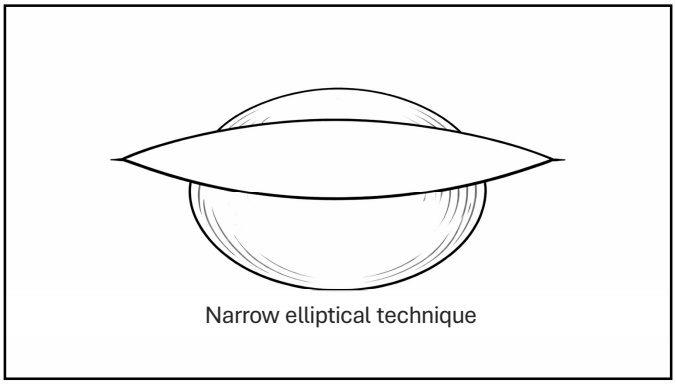

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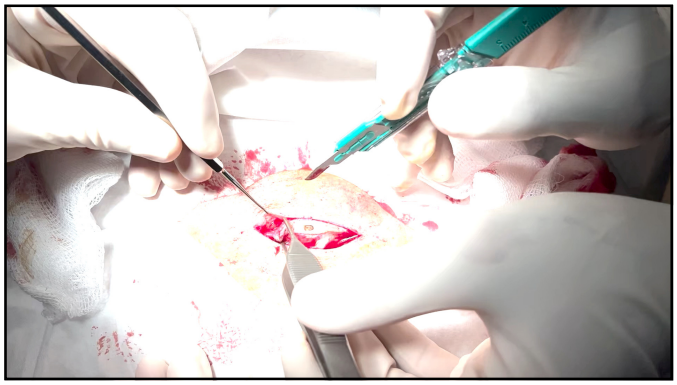

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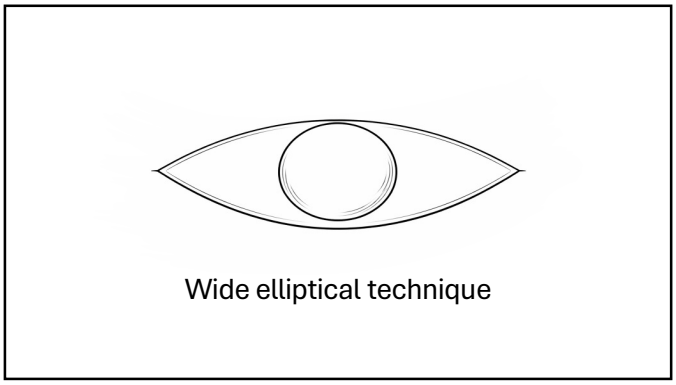

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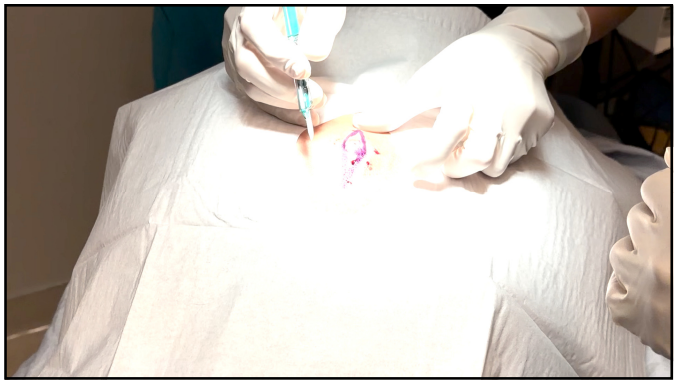

29

Benign Soft Tissue Masses

Type	History	Exam	Imaging	Treatment
Lipoma	40-70yo, ↑BMI	Doughy, mobile	US: isoechoic to subQ fat MRI: fat signal intensity	Expectant mx, excision
Epidermoid cyst	subQ nodule	Mobile, central punctum	US: posterior acoustic enhancement, avascular	Supportive tx, I&D, tetracylines, ILI (small cyst), excision
Pilar cyst	Scalp nodule, >15yo	Firm, oval, alopecia	US: internal echo, calcification, avascular	Expectant mx, excision
Ganglion cyst	Joint, ligament, tendon	Hands, feet, ankles	US: cyst vs solid, adjacent vessels	Expectant mx, aspiration±ILI, excision
Digital mucous cyst	Finger, toes; arthritis	Translucency, nail changes	Dermoscopy: vascular US: hypoechoic, joint connection	Excision (90% cure), cryo-/sclerotherapy, ILI, expectant mx
Plantar fibroma	Mild pain, worse after walking	Nodules along plantar fascia	US: hypo-/isoechoic, fusiform nodules (comb sign)	Orthotics, ILI, excision

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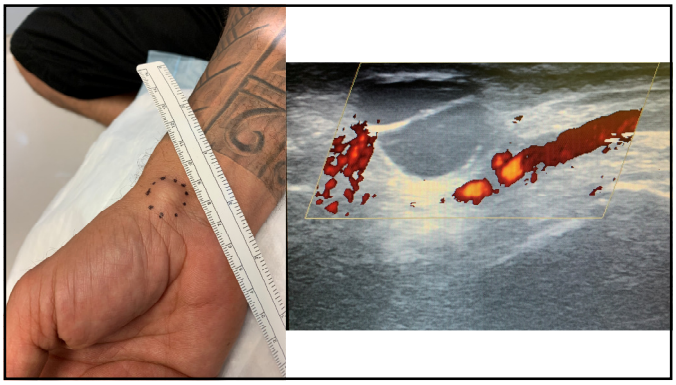
30

31



32

Ganglion cyst management

- Expectant or supportive (e.g., activity modification, splints)
  - 44% spontaneous resolution
- Aspiration +/- ILI (corticosteroids, hyaluronidase)
  - 36-73% recurrence (most studies >50%)
  - Fenestration +/- ILI
- Surgical excision
  - 6-39% recurrence

J Am Acad Orthop Surg. 2023 Jan 15;31(2):e58-e67.
J Hand Surg Am. 2015 Mar;40(3):546-53.e8.
Am Fam Physician. 2024;110(4):402-410.
Orthop Traumatol Surg Res. 2022 Nov;108(7):103198.
Sci Rep. 2025 Jan 29;15(1):3717.

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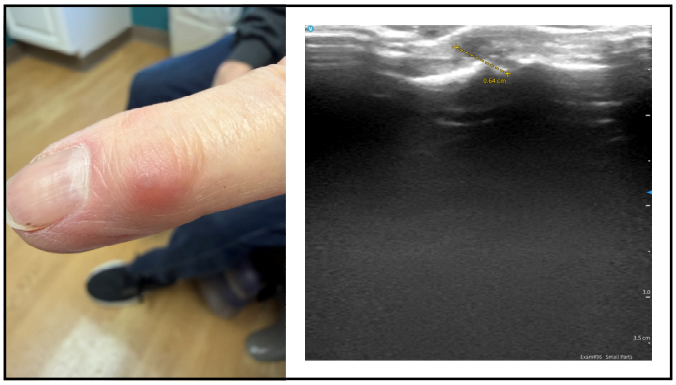

34

Digital mucous cyst management

- Expectant
- Aspiration/puncture +/- ILI
- Surgical excision
  - Cure rate up to 90%
  - Adverse events: decreased mobility, numbness

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J Am Board Fam Med. 2022 Dec 23;35(6):1194-1203.

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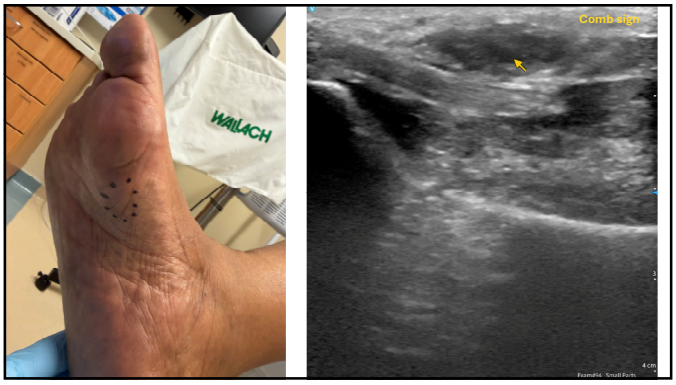

36

Plantar fibroma management

- Expectant or supportive (e.g., orthotic, supportive footwear)
- ILI
- Surgical excision (i.e., subtotal fasciectomy w/ wide excision)

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37

Malignant Soft Tissue Masses (Sarcomas)

Type	History	Exam	Imaging	Treatment
Lipoma-sarcoma	17% soft tissue sarcomas	asymmetry, nontender	XR: fat attenuation, calcification MRI: variable	Orthopedic oncology
Leiomyo-sarcoma	>55yo, abd or back pain	enlarging mass, limbs, head	CT: heterogenous mass	Orthopedic oncology
Dermatofi-brosarcoma protruberans	20-59yo, slow-growing, 1% sarcomas	pink plaque, ulceration, bleeding	US: tentacle projections, hypervascularity	Ortho oncology, Mohs surgery
Rhabdomyo-sarcoma	<10yo, painful cervical mass	head/neck, urogyn areas	US: variable	Orthopedic oncology
Synovio-sarcoma	30-40yo, slow-growing	Painful, 3-10 cm in size	XR: calcifications US: heterogenous, necrosis, calcifications, vascularity variable MRI: isointense to muscle on T1	Orthopedic oncology

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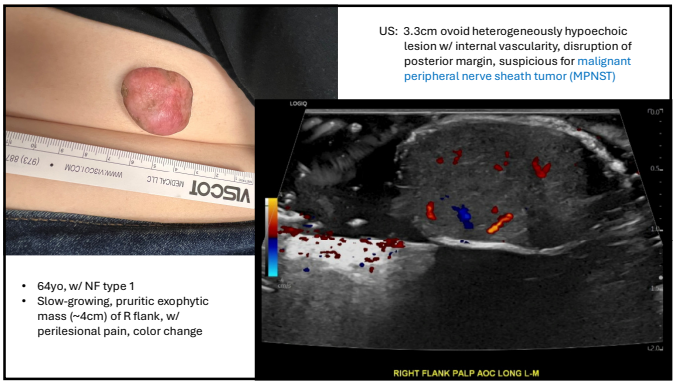
38



US: 3.3cm ovoid heterogeneously hypoechoic lesion w/ internal vascularity, disruption of posterior margin, suspicious for malignant peripheral nerve sheath tumor (MPNST)

- 64yo, w/ NF type 1
- Slow-growing, pruritic exophytic mass (~4cm) of R flank, w/ perilesional pain, color change

39

Practice Recommendations

- Cautiously evaluate large (>5cm), rapidly-growing, symptomatic, deep, adherent, soft tissue masses with ultrasound, then consider other imaging modalities as indicated. (***SOR B/C***)
- Consider a diagnosis of lipoma for discrete, isoechoic masses *without* posterior acoustic enhancement on ultrasonography, and deep-seated lipomas when fine internal echo or whorled pattern is present. (***SOR B/C***)
- Consider a diagnosis of epidermoid cyst for discrete, hypoechoic, avascular masses *with* posterior acoustic enhancement. (***SOR B***)
- Treat benign soft tissue masses expectantly or supportively, medically, or surgically (e.g., aspiration/puncture, ILI, excision). (***SOR B/C***)
- Expedite evaluation (using appropriate imaging) and referral of suspicious soft tissue masses. (***SOR C***)

40

References

- *Am Fam Physician*. 2022; 105(6): 602-612.
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- *J Am Board Fam Med*. 2022 Dec 23;35(6):1194-1203.

41

Any questions?

42

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43