YIC Imaging Guidelines for Soft Tissue Sarcomas

DIAGNOSIS

1. Patient attends GP with soft tissue mass and is assessed clinically;
    a. Observe/Discharge
    b. Investigate

2. Ultrasound
    a. History re-taken regarding – size, duration, precipitants, growth, associated symptoms. Examined for position and local changes.
    b. Ultrasound examination assesses – mass size, location (relation to fascia and anatomical location), echotexture, cyst/solid/mixed, Doppler characteristics.
        i. If diagnostic for non sarcoma (benign) (appendix 1) – report to GP. If appears inflammatory consider interval imaging.
        ii. If diagnostic for non sarcoma (malignant) by history and appearances – report to GP to refer to local oncology (CUP MDT).
        iii. If diagnostic for lipoma but concerning symptoms (appendix 2) – report to GP +/- MRI (notify sarcoma service – non urgent). If lesion is being referred due to concerning clinical features this needs to be mentioned on the report.
        iv. If suspicious for sarcoma or indeterminate (appendix 3)–report to GP + radiologist organises local MRI.

3. MRI – performed if not definitive on Ultrasound/local staging.
    a. Recommended guidance for protocol – appendix 4. (If claustrophobic refer to sarcoma service with ultrasound).
    b. MRI findings:
        i. If diagnostic for non sarcoma (benign) (appendix 1) – report to GP. If appears inflammatory consider interval imaging.
        ii. If diagnostic for non sarcoma (malignant) (appendix 2) – report to GP and refer local oncology (CUP MDT).
        iii. If suspicious for sarcoma or indeterminate (appendix 3)–report to GP (notify sarcoma service -urgent).

BIOPSY

1. In nearly all cases performed by sarcoma MDT and MDT radiologist.
2. Occasionally can be performed locally (outside sarcoma MDT) if sarcoma MDT and local radiologist agreeable and sent to sarcoma histopathologist.

PROVISION OF REFERRER GUIDANCE WITHIN RADIOLOGY REPORTS

The following reporting suggestions are to make clear the responsibility of the referrer in advancing management where referral to the sarcoma MDT is not indicated but when further local action is needed.

To support category 5 or 6.1 findings:

Report: Lipomatous mass with no aggressive features on imaging. If symptomatic advise referral to local surgical unit for consideration of removal.

To support category 4, 6.2, or 7 findings where radiology concern persists in the absence of a defined radiological diagnosis:

Report: No specific or aggressive features on imaging, but given the clinical features advise local clinical review in 3-4 weeks and if there is persisting concern arrange repeat imaging at that time. Referral to the sarcoma MDT is not required unless the serial imaging is suspicious for sarcoma.

Note for reporting radiology teams:

Repeat imaging does not need to be referred to the sarcoma MDT for review unless there is radiological concern for sarcoma based upon the imaging criteria set out in the Appendices of this document.

Appendix 1. Benign diagnoses.

Category	Name	Description
1	Normal	No abnormality seen on ultrasound
2	Benign cyst or Ganglion cyst	Oval lesion, hypo-echoic centrally with a well-defined wall and posterior acoustic enhancement
3	Benign vascular lesion	Solid or cystic structure with minor linear vascularity demonstrated on colour or power settings
4	Benign - Other	Any lesion with either inflammatory characteristics or benign soft tissue mass
5	Lipoma - benign	1. Homogenous lesion within the dermis, deep subcutaneous fat planes or intra-fascial <10cm or <3cm if intramuscular 2. No disorganised power doppler flow, but **septal linear flow allowed**. 3. No or minimal mass effect on the surrounding structures.

Appendix 2. Lipoma requiring further evaluation.

6	Lipoma - requiring further evaluation	1. Documented as clinically painful, enlarging or greater than 10cm if subcutaneous or deep to fascia and greater than 3cm or 2. Lipoma but heterogenicity on ultrasound/MR imaging.

Appendix 3. Indeterminate and Sarcoma

7	Indeterminate	1. Clinically painful or 2. Enlarging solid mass and no Doppler flow.
8	Possible sarcoma/malignant	Solid, heterogeneous lesion, distortion of surrounding anatomy, disorganized vascularity on doppler flow

Appendix 4. MR Imaging protocol guidelines

1. Mark area of mass with capsule(s).

2. MR imaging performed in 2 orthogonal planes, slice thickness dependant on mass size. Small field of view is ideal but if very focussed should perform localiser views so subsequent clinicians involved can determine exact body positioning.

3. Sequences:

a. Axial and - Sagittal or Coronal
b. T1 weighted (without fat suppression)
c. T2 weighted with fat suppression (spectral FSE tried routinely for resolution – if fat suppression failure try STIR). Fast spin echo/Dixon sequences can be used to reduce artefact.
d. No role currently for Diffusion or Elastography.

4. Gadolinium only useful:
    a. To determine solid or cystic (if ultrasound not already performed)
    b. Identify necrotic tumour or haematoma
    c. Patients who have had previous surgery or radiotherapy
    d. If gadolinium given T1 fat saturated sequences should be performed post injection. It is NOT necessary to routinely perform T1 fat saturated sequences pre gadolinium injection.

BIBLIOGRAPHY

1. BSG guidance-for-ultrasound-screening-of-soft-tissue-masses-in-the-trunk-and-extremity. http://www.britishsarcomagroup.org.uk/wp-content/uploads/2019/01/BSG-guidance-for-ultrasound-screening-of-soft-tissue-masses-in-the-trunk-and-extremity-FINAL-Jan-2019.pdf
2. Sarcoma: suspected cancer: recognition and referral. NG12; https://www.nice.org.uk/guidance/ng12
3. Ultrasound for initial evaluation and triage of clinically suspicious soft tissue masses. Lakkaraju A, Sinha R, Garikipati R, Edward S and Robinson P. *Clinical Radiology.* 2009; 64:615-621. Commentary 622-623.
4. Imaging of Soft Tissue Tumors. 2nd ed. Mark J. Kransdorf and Mark D. Murphey. Philadelphia, W. B. Saunders, 2006.
5. Recommendations for Cross-Sectional Imaging in Cancer Management. 2nd issue. Royal College of Radiologists 2006.
6. Improving Outcomes for People with Sarcoma. NICE 2006. https://www.nice.org.uk/guidance/csg9