Ultrasound screening of soft tissue masses in the trunk and extremity - a BSG guide for ultrasonographers and primary care

Introduction

Soft tissue masses in the trunk and extremity are common and most are benign. However, it is very important to rapidly identify malignant tumours, including soft tissue sarcomas. Ultrasound examination is a useful screening test which quickly identifies masses with concerning features and provides rapid reassurance about benign tumours (often lipomas), avoiding the distress and service demands of an unnecessary urgent cancer referral [4, 5].

Referral guidelines recommend that masses which have any of the following features should be referred urgently to a sarcoma multi-disciplinary team (MDT) for investigation and further management:

- Increasing in size
- Size more than 5 cm (except subcutaneous lipomas)
- Painful

Masses which are deep or recur after previous excision are also more likely to be sarcomas [2].

Lipomatous tumours are common in the trunk and extremity and the vast majority, particularly in the subcutaneous tissues, are simple lipomas or benign variants such as angiolipomas or fibrolipomas. Deep lipomatous tumours (under the deep fascia) are most often inter- or intramuscular lipomas or atypical lipomatous tumours (ALTs). ALTs are indolent tumours with no capacity for metastatic spread in the absence of de-differentiation (a rare event), and can be large (considerably greater than 5cm) at presentation. The term "well differentiated liposarcoma" is now only used to describe tumours in the abdomen where the risk of de-differentiation is higher.

5% of patients have multiple lipomas. Angiolipomas are also typically multiple [3] .

Tumours which are confirmed on ultrasound to be lipomatous and located above the deep fascia are rarely malignant or ALTs, even if there are some atypical features on ultrasound (eg vascularity or thickened septae)[1]. Patients can be reassured accordingly and given advice to observe the mass for changes. Furthermore, if necessary, these can be excised by a non-specialist surgical team. In the unlikely event that such a tumour is malignant on histological examination, re-excision including the deep fascia is usually possible, without detriment to long term outcomes.

The aim of this document is therefore to clarify how to screen trunk and extremity soft tissue tumours using ultrasound and triage them appropriately. This document is a companion to the BSG guidance on the management of soft tissue sarcomas [2] .

Ultrasound technique for evaluation of soft tissue masses

The following are recommended for USS of soft tissue masses:

- Scans should be performed or supervised by a clinician who is FRCR or RCR accredited to perform and report ultrasound (preferably musculoskeletal ultrasound).
- A clinical history should be taken, including details of size, duration, precipitants, growth, and associated symptoms, particularly pain.
- A clinical examination of the mass for position and local changes should be performed.
- The ultrasound machine used must be of diagnostic/medical standard with at least 6 monthly quality assurance of electrical safety, transducer, machine and monitor quality.
- Ultrasound should be performed on a high resolution scanner with a linear high frequency probe, typically up to 15/18 mHz, depending on the anatomical location.
- Ultrasound examination should evaluate mass size, mass location (relationship to fascia), echotexture, whether cystic, solid or mixed, and Doppler characteristics (at low flow settings).
- Scans diagnostic of a benign non –tumour diagnosis (such as a ganglion) should be reported to the requesting clinician and GP to manage as appropriate.
- Patients with scans diagnostic of a benign lipoma with typical* or atypical** ultrasound features and which are subcutaneous, painless and not growing can be referred back to primary care for further management. This could include excision by a non-specialist team, observation with advice to patients, or interval scan (for example after 6 months). It is reasonable to refer larger tumours in this category (>7cm) for assessment by a Sarcoma Service, although the risk of malignancy is very low.
- Patients with scans diagnostic of a benign lipoma with typical* or atypical** ultrasound features and with lipomas which are deep to fascia, painful or enlarging should be further investigated with an MRI scan if possible, and should be referred to a Sarcoma Service for advice on a non-urgent basis. This may include review of the imaging and/or the patient.
- If the scan indicates a lipoma with concerning ultrasound features or a non-lipoma with indeterminate or concerning ultrasound features, then an urgent 2 week wait referral to a sarcoma service is appropriate, with an urgent MRI if available.

- Scans which are diagnostic or suspicious of a malignant non sarcomatous mass (such as a lymph node mass) should be reported to the requesting clinician and GP for urgent referral to the appropriate oncology service (Figure 1).

GUIDE FOR ULTRASOUND IMAGING OF LIPOMATOUS TUMOURS

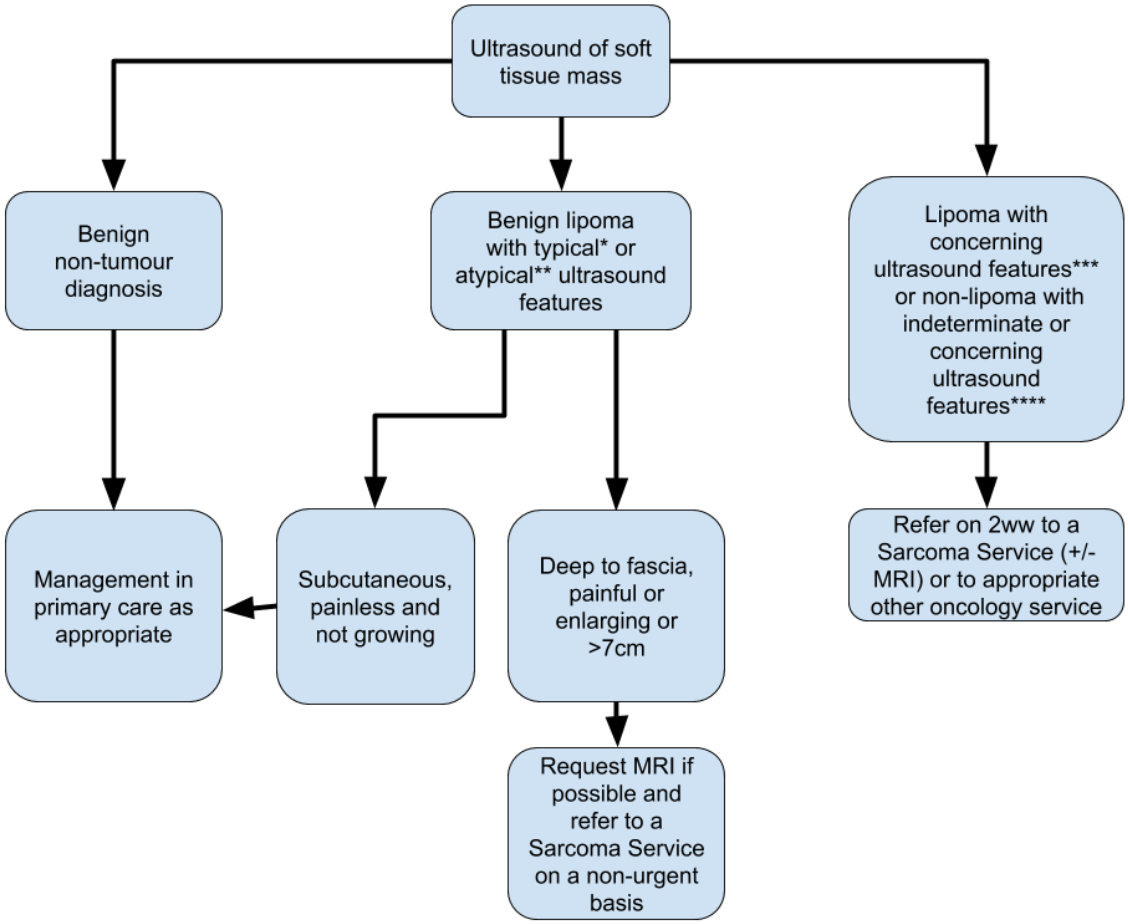
- **Benign lipoma with typical ultrasound features***
  - Homogeneous mass
  - No or septal linear power Doppler flow
  - No or thin (<2mm) septa

- **Benign lipoma with atypical ultrasound features****
  - Lipoma but very thick septa (>2mm)
  - Nodular area(s) of oedema or fat necrosis in predominantly fatty lesion
  - Disorganised power Doppler flow in predominantly fatty lesion

- **Lipoma with concerning ultrasound features*****
  - Nodular area of non-fat signal in a deep lipomatous mass

- **Non-lipoma with indeterminate or concerning ultrasound features******
  - Solid non lipomatous mass
  - Heterogeneous mass
  - Invasive margins
  - Disorganised power Doppler flow in solid heterogeneous lesion

Figure 1. Guide for Ultrasound Imaging of Trunk and Extremity Tumours



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