1. Introduction

- Benign and malignant tumours of the foot and ankle occur at a higher rate than is commonly thought. In a large series, 8% of benign and 5% of malignant soft tissue tumours occurred in the foot and ankle.¹

- Whilst most soft tissue tumours of the foot and ankle are benign, distinguishing them from malignancy can be difficult.⁴ The usual features of a malignant tumour: depth, size and rapid growth may not apply to the foot because of its anatomy. In one series 13% were malignant.²

- The ganglion cyst is the commonest soft tissue mass encountered in the foot and ankle (42%). They are found in around 6% of the population.³

- Ganglion cysts are considered to be a mucoid cystic degeneration of a joint capsule or tendon sheath. They are usually found in areas of frequent physical stress and form a firm subcutaneous nodule that may spontaneously disappear.⁵

- Often there is a prodrome of discomfort before the nodule appears. The nodule itself may cause pain if compressed e.g. in a shoe.

- Depending on location the ganglion cyst may cause nerve compression e.g. in the tarsal tunnel, with consequent nerve symptoms and signs.³⁶

- Diagnosis is by clinical examination including transillumination to establish the cystic nature of the ganglion.

- Treatment may involve no more than reassurance although aspiration/injection can be employed successfully in about 50% of cases.

- Surgical resection is an option with lower recurrence rates at 11% as compared to 63% for conservatively treated ganglion cysts,⁷⁸ although this has to be balanced against potential complications.

- The most important distinction is from a malignant soft tissue tumour, the most common of which is Synovial Sarcoma. Diagnosis is often delayed - 21 months in one series,⁹ and its occasionally indolent course closely mimics that of a ganglion. Epithelioid Sarcoma can also present as an innocuous nodule on the dorsum of the foot in young adults.
2. Ganglion Cysts – High Value Clinical Pathways

2.1 Primary Care

- Diagnosis of a ganglion cyst is made on clinical examination including transillumination.

- If cystic and asymptomatic reassurance is all that is needed. Over 50% will spontaneously resolve particularly in children

- If cystic and symptomatic aspiration will resolve many although recurrence rates of upto 63% are reported7.

- If recurrence does occur repeat aspiration may be attempted but referral should be considered particularly if not straight forward.

- If the diagnosis of cystic nature is in doubt, referral to radiology for ultrasound is recommended. The lesion can then be aspirated/Injected under ultrasound control if appropriate or referred on to secondary care if solid10.

- Solid lesions should be referred urgently. A solid lump should be considered malignant until proven otherwise. Approaching every mass in the foot and ankle as if it were a synovial sarcoma will result in few harmful diagnostic errors.

2.2 Secondary care

- Confirm the diagnosis of ganglion cyst. Consider for daycase (same day discharge) excision usually under regional/general anaesthetic. The ganglion cysts can often be more extensive than apparent.

- Solid or complex lesions should be further investigated with MRI11/ CT. Ultrasound is an accurate way to determine whether these lesions are cystic or solid but benign and malignant neoplasms cannot be differentiated unless there is direct infiltration of surrounding structures12. Onward referral to an appropriate Oncology service should be made on an urgent basis.

- Ganglion cysts causing nerve compression should be dealt with in an expedient manner.
Figure 1 suggested referral model

Lumps & Bumps

History
- Recent increase in size
- Functional impairment

Examination determines management:
1. Cyst
2. Solid
3. Not Sure?

1. Cystic
- Problematic
  - GP to aspirate
  - Recurrent or complex
- Not Problematic
  - Reassure

2. Solid
- Query tumour
- Refer to Orthopaedics

3. Not Sure?
Investigate from Primary Care
Ultrasound scan is investigation of choice
Radiologist to aspirate / inject if cystic, or refer straight on to Orthopaedics if solid
2.3 Research & Audit

- There is very little in the literature on scoring systems in relation to ganglion cysts.
- Over all patient satisfaction rates after surgery are reasonable at around 83%\(^\text{13}\).
- The commonest scoring system used in the literature is the American Orthopaedic Foot & Ankle Society score (AOFAS).
- The Manchester-Oxford Foot & Ankle Questionnaire (MOXFQ) could also be used.
- Quality of life scores could be used pre and post surgery e.g. EuroQuol(EQD5) or short form – SF36

2.4 Linked Metrics

- population prevalence/need – GP Read Codes
- ICD 10 diagnosis codes
- OPCS codes for ganglion excision

2.5 Patient/Public/Clinician information

- Patient information – Patients must be counselled preoperatively regarding the risks and benefits of all surgical options and also the merits of non-operative management.
- GP guidance – Easily accessible information on the risks and benefits of surgical intervention needs to be made available.
- GP guidance – The need for referral if there is any doubt over the diagnosis.

3. Ganglion Cyst – The Evidence Base

- If the diagnosis is certain and the ganglion cyst asymptomatic then a conservative approach can be adopted.
- Up to 50% of ganglion cysts may resolve spontaneously.
- If causing symptoms or problems due to location (particularly a problem on the foot/ankle with shoes) then intervention may be considered.
- Aspiration can be successful but recurrence rates can be as high as 63%.
- Surgery results in high patient satisfaction rates in around 83% and higher if there is nerve compression involved with recurrence rates of around 11%.

**BOFAS position on soft tissue swellings of foot and ankle:**
Abnormal swellings of the foot and ankle need to be referred on an urgent basis for investigation. This should include an ultrasound scan performed by a Musculoskeletal Radiologist. Simple cystic swellings can be regarded as benign and treated symptomatically on a routine basis. Solid or complex swellings require further investigation and consideration of excision biopsy on an urgent basis.
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