The increasing use of imaging studies has led to an increase in detection of incidental focal liver lesions (FLL).

Understand radiology reports for incidental FLL – and recognizing the need for referral, routine follow-up or no further follow-up.

Recognising that excluding malignancy is paramount.

Subsequent management and recommended imaging follow up of some of these focal liver lesions in primary care.
Simplified flow chart of imaging techniques used to study incidental liver lesions:

1. **US**
   - **Solid**
     - Hemangioma
       - Stop
     - Undetermined
       - Dynamic CT
         - Typical Hemangioma
           - Stop
         - Typical FNH
           - Dynamic CT/MRI (if performed earlier)
         - Undetermined
           - MRI with specific contrast agents
           - Stop
     - FNH (Bmode + Doppler)
       - Stop
   - Cystic
     - Simple Cyst
       - Stop
     - Complex Cyst
       - MRI with specific contrast agents

**Approach to FLs**

- Risk factors for HCC, HO of malignancy, elevated tumor markers, weight loss
  - Yes
    - Dynamic CT/MRI
  - No
    - ("Incidentaloma")
      - Suspect benign lesion
        - Solid
          - Hemangioma
          - Cystic
            - Dynamic CT/MRI
              - Metastasis
              - Other
          - Central scar
            - Asymptomatic simple
              - Observe
            - Symptomatic complex
              - Investigate
              - Abscess
              - Hydatid cyst

:cholangiocarcinoma; CT, computed tomography; FL, focal liver lesion; FNH, focal nodular hyperplasia; HCA, hepatocellular carcinoma; HCO, history of; MRI, magnetic resonance imaging.
Simplified flow chart of imaging techniques used to study incidental liver lesions

- US
  - CEUS
  - Multiphase Liver CT
  - MRI Liver
Lesion 1

Well defined mass, hypoechoic rim !!!

Primary or secondary lesion.

Further evaluation with multiphasic imaging.

* Patients with chronic liver disease, and a solid FLL, are at high risk of having HCC.
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Referral to appropriate MDT
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Lesion 2

Well-defined, anechoic, lesion with posterior acoustic enhancement
Lesion 2

Homogenous lesion; fluid signal characteristics, without contrast enhancement
Hepatic cysts

- 2-7% of population
- Uncommon before the age of 40 years
- Adjacent liver tissue is normal without evidence of fibrosis/inflammation

- Natural history
  - Predominantly benign.
  - Not thought to be premalignant precursors to the development of primary biliary cystic tumours.
Management of Hepatic Cysts

Imaging

* Usually no follow up or multiphasic imaging required.
* Monitor large cysts (>4cm) periodically with US to ensure stability.
* If in doubt, 3-6/12 interval scan.
* CT/MRI for those with additional, non characteristic features

Treatment

(1) Incidentally identified asymptomatic cysts do not need follow-up or treatment.

(2) Hepatic cysts that are symptomatic because of haemorrhage, rupture, infection, or growth merit referral for intervention.
Complex cysts?

- Multiple cysts (>20)
- Heterogenous echotexture
- Thick walled
- Irregular walls
- Nodular
- Loculated
- Septations
- Daughter cysts
Peripheral nodular enhancement with progressive centripetal fill-in
Lesion 3

Homogenous, hyperechoic, sharp margins
Hepatic Haemangioma

Background

* Most common benign neoplasm of the liver.
* Affects all ages; between 30-50 years.
* Frequently small (<4cm) to >20cm.
  * Even when large, usually asymptomatic.
* Usually stable in size
* Spontaneous bleeding is rare.
Management of Hepatic Haemangioma

Radiology

- Asymptomatic patients, <5cm, with classical haemangioma appearances can be reassured without imaging follow-up.
- Atypical or patients with suspected primary malignancy, require additional multiphasic imaging (MRI).
- Rapid growth has been documented, justifying close radiological follow up of lesions >5cm, especially those in subcapsular region.

Treatment

- Ignore
- Refer to liver tumour MDT if:
  - Symptomatic patients (e.g. from compression of adjacent structures)
  - Growing.
If in doubt, do dynamic CT/MRI

* MRI has the highest sensitivity compared to US and CT
Focal Nodular Hyperplasia

**Background**

- 2\textsuperscript{nd} most frequent benign tumour.
- Predominantly in young females (90%), average age at presentation 35-50 years.
- Multiple in 20%.

**Clinical**

- Natural history is of stability.
- No malignant potential.
- Complications are exceedingly rare.
Management of FNH

Radiology

- Asymptomatic with firm imaging diagnosis
  - Nil follow up necessary.

- Symptomatic, or equivocal imaging
  - Refer to liver MDT.

- Annual US for 2-3 years
  - Women with FNH who wish to continue OCP use.

Treatment

- Conservative approach recommended.

- Surgery for:
  - Symptomatic FNH
  - Suspicious lesion despite imaging.
Lesion 5

Hepatocellular adenoma: comparison between real-time contrast-enhanced ultrasound and dynamic computed tomography.

Wang W1, Liu X1, Yang Z2, Wang Y2, Shen X3, Wu F1, Huang Y1, Shu E1, Xie X1, Liu MD1, Wang Z1, Chan MD1.
Lesion 5
Hepatocellular Adenoma

Background

* Benign tumour of hepatocellular origin.
* Rare: women aged 35-40 years.
* Associations:
  * OCP
  * Familial in maturity onset diabetes of the young
  * Glycogen storage diseases, acromegaly
  * Androgen use
* Multiple in 20%, greater than 10 is adenomatosis.

Clinical

* Usually asymptomatic.
* High propensity to bleed, rupture, and may undergo malignant transformation.
Management of Hepatocellular Adenoma

Radiology

* All presumed HCA
  * Reassessment with CE-MRI after 6/12.

* HCA <5cm
  * 6 monthly for 2 years.
  * Annual follow up subsequently.
  * Biannual after 5 years if stable/reducing in size.

Treatment

* Natural history and prognosis is not well established.

* OCP/anabolic steroids are to be avoided.

* Given potential role for haemorrhage and malignant transformation:
  * Referral to liver tumour MDT is advised.
What to do with Benign and Malignant Focal Liver Lesions: Ignore / Follow up / Refer?

* Relatively common and vast majority are benign.

* Imperative to confidently exclude a malignancy.

* The radiological imaging and clinical context must always be considered together to form an accurate differential diagnosis.