Multiparametric Prostate MRI

Imaging Network

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Cancer Research UK. Increased diagnosis due to incr use of PSA test. Little change in survival / mortality rates.
Localised (T1+T2) 90% 5 yr survival. Locally advanced (T3) with treatment (DXT and hormones) 70-80% 5 yr. Metastatic 30% 5 yr. Low grade (Gleason 6) 98% 5 yr, high grade 67% 5 yr.
Current Prostate Cancer Pathway

- Screening for prostate cancer
  - Risk for prostate cancer
    - Biopsy
      - Cancer
        - Decision-making
          - Active surveillance
          - Surgery
          - Radiotherapy
            - Failure
              - Watchful waiting +/− hormones
      - No cancer
Limitations to Current Practice

• Picks up clinically indolent cancers by chance
• Misses clinically significant lesions anteriorly as only biopsies posterior gland
• Classifies cancers incorrectly – underestimates grade in 1/3 and extent by ¼

• Whole gland Rx does harm

NEJM article July 2012 - 360 patients. Observation or RP. Men with low risk disease more likely to die (62 v 54) if allocated to RP group rather than conservative Mx (p=0.07). AND surgical complications, incontinence, erectile dys.
Challenges to Current Pathway

• Not all lesions detected are clinically significant
• Deciding what is clinically significant and what we need to treat
• Deciding what we don’t need to find or treat
Is it time to consider a role for MRI before prostate biopsy?

Screening for prostate cancer

Risk for prostate cancer

Biopsy

Cancer

Decision-making

Active surveillance

Surgery

Radiotherapy

No cancer

MRI ‘negative’

Failure

Watchful waiting +/- hormones
Multiparametric MRI

- Multiparametric = standard sequences + diffusion weighted sequences (DWI) and dynamic contrast (DCE)
- NICE guidelines (2014) - post negative biopsy, staging, active surveillance
- Key performance characteristic – misses majority of small (<0.1cm³), low grade tumours
Multiparametric MRI

• Body of evidence

• T2+DCE+DWI best combination (pre biopsy)
  • High sensitivity (86%)
  • High specificity (94%)
  • High NPV (95%)


Benefits of MRI pre prostate biopsy

- Baseline MRI
- Avoid biopsy related haemorrhage artefact
- Improved lesion characterisation
- Combine with panel of other markers
- Guides management
  - Targets biopsies in high risk group
  - Avoid unnecessary biopsies
  - In low risk and negative mpMRI TRUS could be avoided in 47%
Advantages of mpMRI and targeted biopsy

- Whole gland assessment
- Guides targeted biopsies
- Improved detection of clinically significant cancers
- Reduced detection of clinically insignificant cancers
- Improved assessment of size and grade
- Improved evaluation and prognostication
mpMRI post prostate biopsy

• Still has a role
  • Re evaluates risk
  • Biopsies miss cancer
  • Rules out advanced disease
The evidence suggests

- We should not be performing any MRI post biopsy.
- We should not be performing any biopsy without a mpMRI.
Current situation across the network- variable

• Not all dept’s in the network have the capacity to do pre-biopsy MRI’s
• There is variation in timing of MRI in the patient pathway and MRI technique (eg post contrast)
• Detailed assessment of current practice across the network is being undertaken
Aims of Imaging Network

• Identify variance in prostate imaging across the participating hospitals of the network
  • Standardised approach
• Agree a protocol incorporating NICE guidelines
Aims of the Imaging Network

- Standardise Reports
- Reporting proforma
- Diagram - scoring system
- Agree quality assessment measures
Summary

- mpMRI powerful tool in the prostate cancer pathway
- Imaging Network aims to standardise the approach to imaging in the pathway
Thank You