**An audit on correlation of prostate MRI scored as PIRADS 2 with biopsy results**

**Descriptor:**

NICE guidelines of 2019 recommend biopsies can be safely omitted for men with LIKERT score of less than or equal to 2 on prebiopsy MRI prostate

**Background:**

Several studies have stressed about high negative predictive value (NPV) or  ‘rule out’ ability of a negative MRI prostate (score of 2 or more), approximately 91.7%  compared to a positive MRI (scored 3 to 5) with a positive predictive value (PPV) or rule in ability of 49.9%. High negative predictive value (NPV) of multiparametric MRI (mpMRI) in ruling out clinically significant prostate cancer (csPCa) documented in previous studies have been considered to omit biopsies in low risk patients, also emphasized in recent NICE 2019 guidelines. Assessing csPCa by pathological criterias can alter the apparent high NPV value of mpMRI and show actual percentage of significant volume cancer where patients might opt for active management.

While most studies assessing NPV of MRI considered more than or equal to Gleason 7 (3+4) as the only criteria for  csPCA , newer evidence suggests that high-volume Gleason 3+3 are considered candidates for active management.

Pathological criteria for significant cancer on needle biopsy, which might require active surveillance are:

Gleason score > or =6 with

* >or =3 cores with cancer
* > or =50% of  cancer in involved core
* Max tumour length >6mm
* Active management is considered for patients with Gleason 3+3 disease with higher volume cancers (as defined by above pathology criteria).
* Audit aim to estimate percentage of significant prostate cancer defined by pathological criteria on needle biopsy in patients with  prebiopsy MRIs scored as PIRADS 2.

## The Cycle

**The standard:**

Pre-biopsy multiparametric MRI prostate scored as PIRADS 2 or unremarkable  were correlated with prostate needle biopsy results (template/precision point perineal biopsies).

Post biopsy MRI prostates have been excluded. Biopsy results of radical prostatectomy have not been taken into consideration.

**Target:**

Assess percentage of patients with Gleason 4+3 > or = cancers and significant volume cancers (defined  by  pathological criterias) on prostate biopsies of patients scored as PIRADS2 or unremarkable.

95% of patients should have less than Gleason 4+3  disease on biopsy (by standard criteria of cs Pca) .

90% of patients should have insignificant volume of cancer even with Gleason 3+3 disease (by histopathological criteria).

To assess biopsy avoidance rate (percentage of PIRADS 2 score MRI who did not ultimately undergo biopsy and were on active surveillance) .

## Assess local practice

**Indicators:**

mpMRI referral criteria in our trust are  as follows: UTI excluded, patient must be fit for undergoing radical therapy. Two reports of raised PSA with 4 weeks interval as per the elevated age specific PSA level (>3 ng/ml PSA for 50-70 years , >5 ng /ml for >70 years). DRE: T2- T3. One PSA level between 20-50 ng/ml. Exclusion from MRI: Clinically T4 and PSA over 50 ng/ml.

Indications of biopsy in such patients with negative prebiopsy MRI due to one of the following reasons: Discrepancy between MRI or DRE findings/High PSA density or velocity /strong family history/patient’s choice

**Data items to be collected:**

Prebiopsy MRI results, PIRADS score.

Age, PSA values, Prostate volume, PSA density, DRE findings

Details of histopathological findings with Gleason score, tumour volume, maximum length of tumour core, percentage of positive cores.

Results to be tabulated as:

1.Number of patients with no cancer on biopsy or less than Gleason 4+3 disease and with low volume tumour.

2.Number of patients with < Gleason 4+3  grade but high volume disease (in accordance wit pathological criteria)

3.Number of patients with gleason 4+3 > or = cancers on biopsy

Calculate negative predictive value of mpMRI prostates in ruling out Gleason 4+3 or higher cancers.

and Negative predictive value in ruling out significant volume cancers with Gleason 6 or higher grade (as per pathological criterias)

Number of patients  scored with PIRADS2 or negative MRI who did not have biopsy within a year's time compared to total number of MRI prostates undertaken in that period.

**Suggested number:**

50 patients of pre biopsy MRI prostate  scored as PIRADS 2 with available prostate biopsy (template/perineal) results.

**Suggestions for change if target not met:**

Gleason score is one among many criterias to define  csPCa  on needle biopsy, hence defining significant disease only in accordance with Gleason score would give us a false sense of satisfaction. This might  exclude  patients with significant volume cancers of Gleason 6 disease from active treatment.

If target not met :

Prebiopsy MRI prostate cases (with a PSA density >0.15 ng/ml/ml) should be carefully reviewed, preferably by 2 uroradiologists independently, before assigning P2 score. Assigning Likert score, considering family history/DRE findings, PSA velocity like clinical parameters and not just PIRADS score based on imaging.

Conducting longitudinal study over a  time period including patients on active surveillance and estimating number of patients requiring biopsies following repeat MRI with worsening PSA or signal changes and correlating biopsy avoidance rates to assess the benefit of imaging  in reducing  actual burden of  prostate biopsies  and cost effectiveness of  screening imaging.

**Resources:**

Data collection: 20 hours from PACS, patient RIS, ICE (for psa values and pathoogical results)

Data analysis: for 4 hours

Report writing: 6 hours.

**References:**

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**Submitted by:**

Dr.Shanti Ranjan Sanyal

**Co-authors:**

Khattab Mohamed

Amin Nisreen

**Published Date:**

Friday 6 May 2022

**Last Reviewed:**

Friday 6 May 2022