

Multiparametric MRI:

The New Paradigm to Avoid Overdiagnosis & Overtreatment in Prostate Cancer

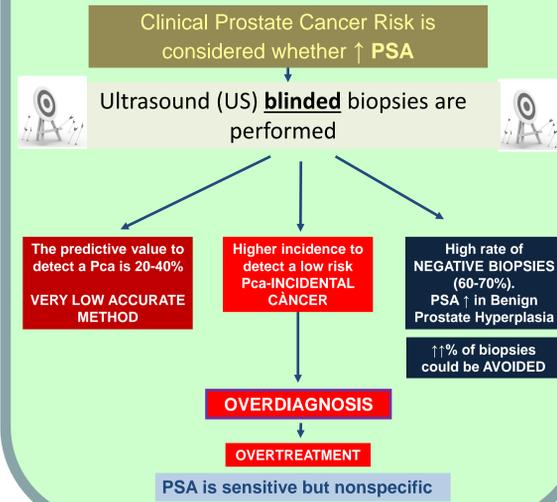
Joan C. Vilanova

Department of Radiology. Clínica Girona // Catalan Institute of Health. Institute of Diagnostic Imaging (IDI) // School of Medicine. University of Girona. Girona. Catalonia. Spain.

PROSTATE CANCER FACTS

- PCa is a complex disease with many controversial aspects of management
- It is the most common diagnosed visceral cancer
- **Life time risk is 16% but the risk of dying is only 3%**
- This discrepancy between the cancer incidence and lethality is due to high incidence of incidental cancer ("non significant") detected. That means a **low grade Pca that do not require any active, invasive treatment.**
- **But why is there a high incidence of indolent Pca? Because of the current diagnostic approach →**

CURRENT APPROACH TO DIAGNOSE PROSTATE CANCER



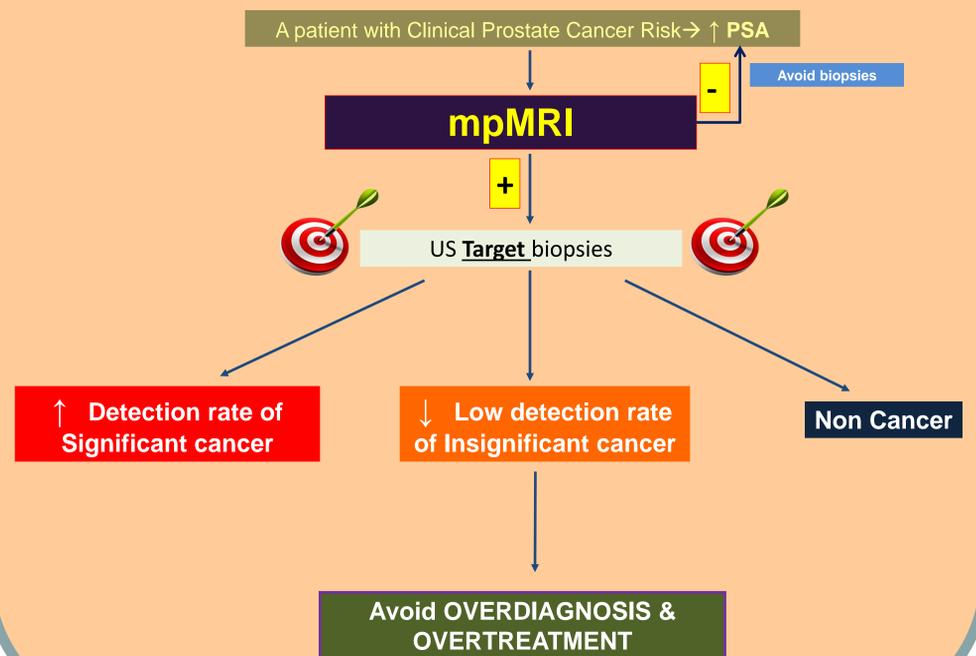
THE PARADIGM SHIFT

- Improve the **selection of patients that will benefit from a biopsy**. That means increase the positive detection rate of Pca (*the significant cancer*)
- Improve the methodology of the biopsy → change from blinded to **target biopsies**
- In the era of robotics, it is reasonable to perform blinded biopsies **without a previous image of the prostate?** Why the prostate is the *only organ that blinded biopsies are being performed?*
- **Multiparametric MRI provides information to reduce overdiagnosis and overtreatment → DETECT THE SIGNIFICANT CANCER, and avoid to detect the non significant cancer**

MULTIPARAMETRIC MRI (mpMRI) OF THE PROSTATE

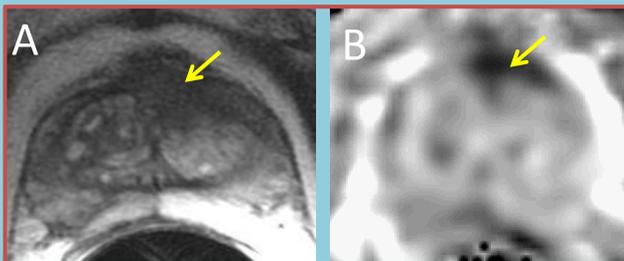
- Mp MR is an imaging technique that provides an accurate diagnosis and offers an excellent negative predictive value to detect the **significant cancer, before biopsy.**
- Mp MRI combined with biopsies – **target biopsies** (not blinded) - consolidate both positive and negative biopsy results and allow patients to be offered more appropriate treatments (active monitoring, radical treatment in full knowledge of the topography of the lesions involved, or local treatment, etc.)
- It does not require advanced equipment, can be performed in **any MR centre**
- It is performed with **Standardized technique**: PIRADS (Prostate Imaging Reporting and Data System) protocol. **Fast** technique < 30' examination.
- Mp MRI provides morphological (T2 sequence) and functional (diffusion sequence -DWI-) information, "multiparametric" → mpMRI

PROPOSED NEW APPROACH

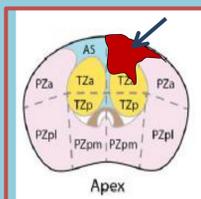


PRACTICAL CASE – mpMRI APPROACH

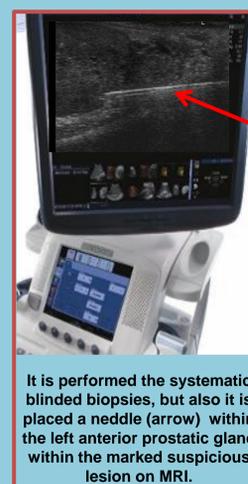
A 71-year-old male had a previous negative biopsy with a PSA of 8,35 ng/ml. One year later the PSA is 9,23ng/ml
A mpMRI is requested due to the clinical risk of prostate cancer as PSA is increasing progressively



Axial plane on T2 MRI sequence (A) and axial plane on diffusion (DWI) (apparent coefficient map) (B) shows a nodular suspicious lesions in the left anterior side of the transitional zone of the prostate (arrows).
The lesion demonstrates the criteria of a PIRADS score of 5/5; clinically significant cancer is highly likely to be present



The lesion is marked on the template sector map (arrow) in order to allow the localization on the US procedure of the biopsy



It is performed the systematic blinded biopsies, but also it is placed a needle (arrow) within the left anterior prostatic gland within the marked suspicious lesion on MRI.

BIOPSY Pathology report:

- 8 cores from the systematic procedure are negative for malignant cells.
- The **ONLY CORE** marked from the anterior left gland shows prostate cancer Gleason 3+4 (significant cancer).

✓ The systematic blinded biopsy would had been again negative for prostate cancer.

✓ It is not reasonable on the XXI century to perform random biopsies and leave the chance to detect a significant cancer; and overdiagnose a non significant cancer

CONCLUSIONS

- Prostate MR imaging can reduce overdiagnosis and overtreatment of prostate cancer
- Prostate MRI provides a helpful tool to improve the work up of prostate cancer diagnosis
- Prostate MRI increases the detection rate of the significant cancer and reduces the detection of low-risk cancer
- A standardized prostate MRI guidelines – PIRADS – has been settled to implement the technique on the new paradigm shift to manage the diagnosis of prostate cancer
- It should be validated multicenter data to allow all patients with suspected prostate cancer to benefit from this approach but it should be established a better risk stratification to include patients on the new paradigm to diagnose PCa

REFERENCES

- De Visschere P.J.L., Briganti A., Fütterer J.J., Ghadjari P., Isbarn H., Massard C., et al. Role of multiparametric magnetic resonance imaging in early detection of prostate cancer. *Insights Imaging*. 2016 Apr;7(2):205–14.
- Emberton M. Are men who are biopsied without prior prostate magnetic resonance imaging getting standard care? *BJU Int*. 2015 Dec;116(6):837–9.
- Giannarini G., Briganti A., Crestani A., Rossanese M., Montorsi F., Ficarra V., Diamas S. Systematic Transrectal Ultrasound-guided and Embrace Targeted Magnetic Resonance Imaging-informed Prostate Biopsy: Is the Paradigm Ready to Shift? *Eur Urol*. 2016 Mar;69(3):381–3.
- Padhani AR, Petralia G, Sanguedolce F. Magnetic Resonance Imaging Before Prostate Biopsy: Time to Talk. *Eur Urol*. 2016 Jan;69(1):1–3.
- Panebianco V, Barchetti F, Sclarrà A, Ciardi A, Indino EL, Papalla R, et al. Multiparametric magnetic resonance imaging vs. standard care in men being evaluated for prostate cancer: a randomized study. *Urol Oncol*. 2015 Jan;33(1):17.e1–7.
- Prostate MRI: www.esur.org [Internet]. [cited 2016 Jul 21]. Available from: <http://www.esur.org/esur-guidelines/prostate-mri/>
- Rosenkrantz AB, Taneja SS. Prostate MRI can reduce overdiagnosis and overtreatment of prostate cancer. *Acad Radiol*. 2015 Aug;22(8):1000–6.
- Siegel RL, Miller KD, Jemal A. Cancer statistics, 2016. *CA Cancer J Clin*. 2016 Feb;66(1):7–30.
- Silberstein JL, Pal SK, Lewis B, Sartor O. Current clinical challenges in prostate cancer. *Transl Androl Urol*. 2013 Sep;2(3):122–36.