Multiparametric magnetic resonance (mpMRI) of the prostate during Active Surveillance for low-risk prostate cancer: time to reduce the number of follow-up biopsies?

S. Luzzago[1,2], M. Catellani[1], F.A. Mistretta[1,2], A. Conti[1,2], E. Di Trapani[1], R. Bianchi[1], G. Cozzi[1], P. Pricolo[3], S. Alessi[3], M. Ferro[1], G. Cordima[1], D.V. Matei[1], G. Petralia[3], G. Musi[1], O. de Cobelli[1,2]

[1]Istituto Europeo di Oncologia (IEO), Dipartimento di Urologia, Milano [2]Università degli Studi di Milano, Milano [3]Istituto Europeo di Oncologia (IEO), Dipartimento di Radiologia, Milano

INTRODUCTION

During active surveillance (AS), the possibility to spare follow-up biopsies in the setting of multi-parametric magnetic resonance (mpMRI) non-suspicious for clinically significant prostate cancer (csPCa) has been proposed. The aim of our study is to evaluate pathological outcomes of men enrolled in an AS program and submitted to baseline and repeated mpMRIs during time.

MATERIALS AND METHODS

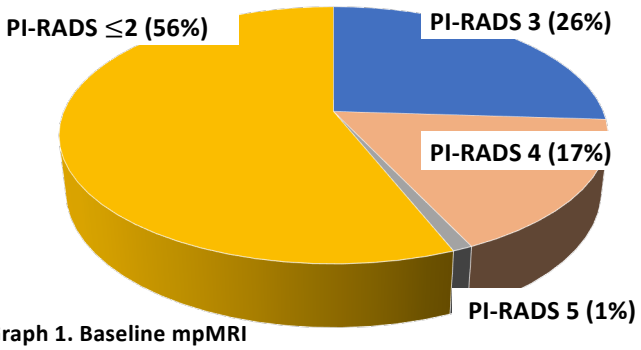
Patient population

- From 2006 to 2018, 455 patients were enrolled in AS. All patients met PRIAS criteria and were scheduled to 1, 3 and 7-year surveillance-biopsies, and repeated 1.5-T mpMRIs.
- **177 (40%) men repeated at least 2 mpMRIs and were considered for final analysis.**
- If a suspicious lesion (i.e. PI-RADS≥3) was seen at repeated mpMRI, 2-3 cores from the target area were addictionaly taken with a cognitive approach.

Statistical analyses

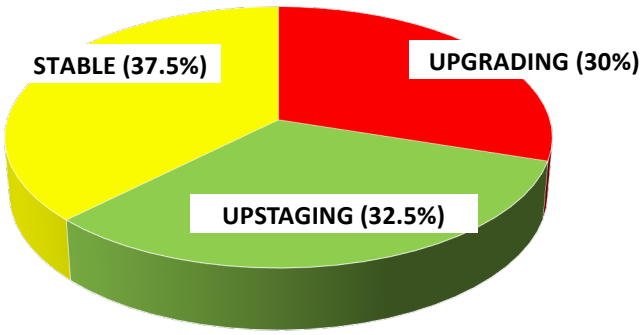
- **Radiological upgrading**: switching from a lower to a higher PI-RADS score at repeated mpMRIs.
- **Imaging upstaging**: significant increase in the maximum diameter of the lesion (i.e.≥2 mm)
- **Pathological progression**: GS upgrading at repeated biopsies and/or at radical prostatectomy.
- **Sensitivity, specificity, PPV and NPV** were evaluated for radiological upgrading, imaging upstaging, both of them (upgrading + upstaging) and overall radiological progression (upgrading or upstaging)

RESULTS



Graph 1. Baseline mpMRI

- Overall, 2 (1%), 29 (17%), 46 (26%) and 100 (56%) patients has a PI-RADS score 5, 4, 3 and ≤2 at first mpMRI, respectively.
- Globally, 89 (50%) and 32 (18%) patients underwent 3 and 4 prostate samplings, respectively.
- Median time of persistence in AS was 36 (21-60) months.
- 34 (20%) switched to active treatment. 21 (12%) pathological progression



Graph 2. Radiological progression

- 177 (40%), 71 (16%), 23 (5%) and 5 (1%) men submitted to 2, 3, 4 and 5 repeated mpMRIs during AS, respectively.
- During AS, 54 (30%), 58 (32.5%), 35 (20%) and 77 (43.5%) men developed radiological upgrading, upstaging, both of them and overall imaging progression, respectively.

Radiologic progression	Pathological progression (n=21)
Rad. UPSTAGING	
Yes (n=58)	14 (66.6%)
No (n=119)	7 (33.4%)
Rad. UPGRADING	
Yes (n=54)	12 (57%)
No (n=123)	9 (43%)
UPSTAGING + UPGRADING	
Yes (n=35)	11 (52.5%)
No (n=142)	10 (47.5%)
UPSTAGING or UPGRADING	
Yes (n=77)	15 (71%)
No (n=100)	6 (29%)

Table 1. Diagnostic performance

Rad. UPSTAGING
- PPV: 21% (12/58)
- NPV: 92.5% (110/119)

UPSTAGING+UPGRADING
- PPV: 31.5% (11/35)
- NPV: 93% (132/142)

Rad. UPGRADING
- PPV: 26% (14/54)
- NPV: 94% (116/123)

UPSTAGING or UPGRADING
- PPV: 20% (15/77)
- NPV: 94% (94/100)

CONCLUSION

During AS, the possibility to spare repeated biopsies in patients without radiological progression should be taken into account, since only 6-8% of them harbour a csPCa. However, patients showing radiological progression should not be directly switched to active treatment because of the relatively low PPV of repeated mpMRIs