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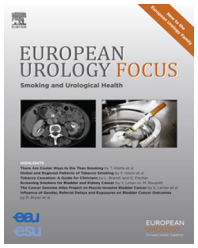

Review – Prostate Cancer

Repeat Prostate Biopsy: Rationale, Indications, and Strategies

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Abstract

Background: The inaccuracy of prostate biopsy in detecting and characterising prostate cancer (PCa) has led to a widespread use of repeat biopsy (RB).
Objective: To summarise the most recent data regarding indication, techniques, and clinical implications of RB.
Evidence acquisition: A search of Medline, PubMed, and Scopus identified articles published in the last 7 yr (2008–2014) addressing the role of RB in the PCa setting. Abstracts deemed relevant to the defined review question were screened, and the data were extracted, analysed, and summarised.
Evidence synthesis: RB can be considered either in patients with persistent PCa suspicion after a first negative systematic biopsy or during active surveillance (AS), either to confirm patient enrolment or to monitor the natural progression of the disease. Indication and biopsy techniques differ according to each PCa scenario. Magnetic resonance imaging (MRI)-guided RB has been gaining popularity because of its accuracy in detecting and characterising PCa. Indications for multiple RBs (eg, AS setting) should be carefully evaluated because of the cumulative risk of complications, especially infection. In the next few years, clinical and genetic markers are expected to further improve the ability to determine the need for RB.
Conclusions: RB indications and techniques in persistent PCa suspicion and AS should take into account the evolving field of imaging, management options, and the risk of possible complications. In an RB setting, the introduction in daily clinical practice of MRI-guided targeted biopsy has improved the accuracy in detecting PCa without significantly increasing the risk of finding indolent, low-risk PCa. Referral to specialised care centres should be considered in patients with persistent PCa suspicion to provide the most rationalised management in terms of indication, biopsy technique, complications, pathologic assessment, and, finally, clinical implications of the findings.
Patient summary: A man may require a second prostatic biopsy for a number of reasons. In the current report, we describe why, when, and how a patient should undergo rebiopsy of the prostate.

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1. Introduction

Repeat biopsy (RB) is usually contemplated in a prostate cancer (PCa) setting in two different clinical scenarios: (1) patients with persistent PCa suspicion after a first negative systematic biopsy and (2) during active surveillance (AS), either to confirm patient enrolment or to monitor the natural progression the disease during the follow-up period. Although some of the characteristics and technical aspects may be similar in these two circumstances, the rationale

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behind the choice of performing an RB and the clinical implications of the results differ substantially between the two settings.

The motivation behind performing an RB in men with a persistent suspicion of PCa after a negative biopsy is mainly related to the diagnostic uncertainty of the standard transrectal ultrasound (TRUS)-guided biopsy in detecting and characterising the cancer. The standard biopsy strategy is, indeed, subject to sampling error (25–35% and 10–20% for all and significant cancers, respectively) [1–4] and provides poor localisation of the disease. More specifically, the primary limitations of initial biopsy include the failure to accurately detect high-grade cancer, imprecise tumour risk stratification, and the detection of small, low-risk, indolent cancers [1–4].

In potential candidates for AS protocols, RB has been proposed to confirm patients' eligibility or, during the follow-up, to eventually switch the patient to a definitive treatment in case of reclassification. In this scenario, RB is used to better classify tumour characteristics or for the early detection of tumour progression [1–4].

In the current review, we aim to summarise the most recent data regarding indication, techniques, and clinical implications of an RB in these circumstances.

2. Evidence acquisition

An initial search was carried out using the Medline, PubMed, and Scopus databases. Because of dramatic stage migrations over the last decades resulting from the introduction of prostate-specific antigen (PSA) screening, AS and, MRI, we mainly focussed on publications in the years 2008–2014 to provide data that may be applicable to contemporary PCa patients. However, we did not exclude commonly referenced and highly regarded older publications. The search terms used were *(repeat biopsy OR saturation OR rebiopsy) AND (prostate OR prostate cancer) AND (diagnosis OR active surveillance OR radiotherapy OR focal therapy OR PSA failure OR PSA relapse)*. Abstracts were reviewed for relevance to the defined review question. If it was not clear from the abstract whether the paper might contain relevant data, the full paper was assessed. The references cited in all full-text articles were also assessed for additional relevant articles. Non-English articles were excluded from analysis. Relevant studies were then screened by the three authors, and data were extracted, analysed, and summarised. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses flowchart was used to report the number of papers identified and included or excluded at each stage (Fig. 1).

3. Evidence synthesis

3.1. *Repeat biopsy after a negative first biopsy*

3.1.1. *Indication for repeating a prostate biopsy*

The most frequent motivation behind an RB is to correct or mitigate previous undersampling or any error associated

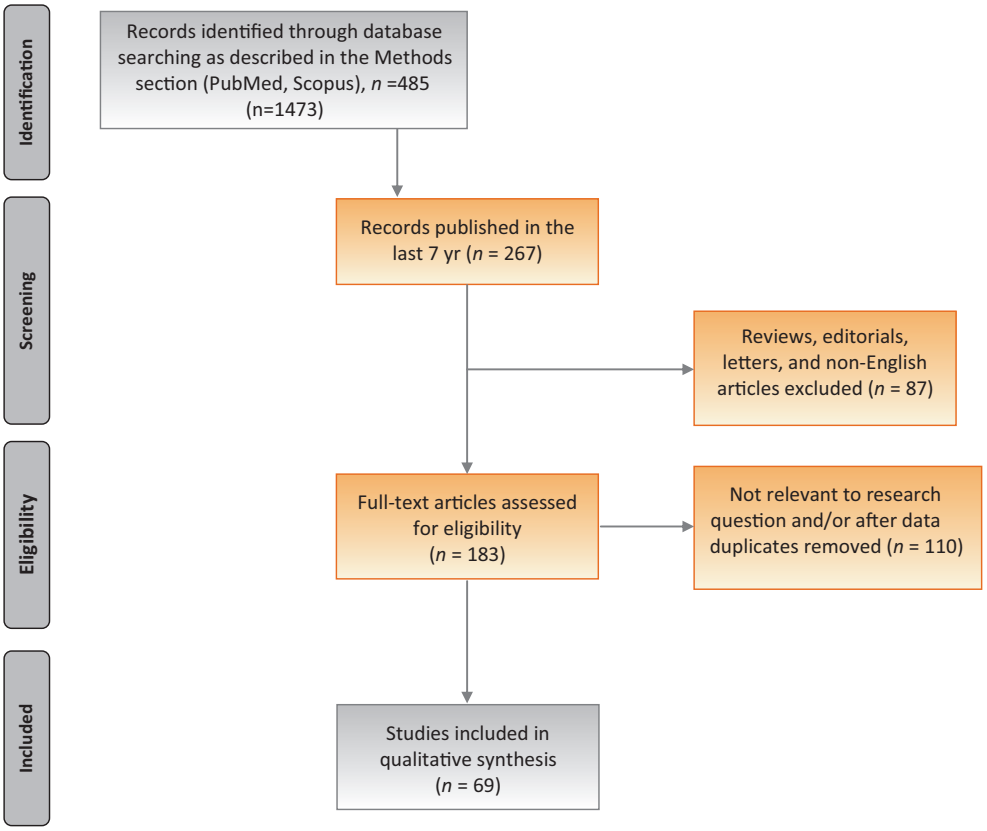

Fig. 1 – Preferred Reporting Items for Systematic Reviews and Meta-Analysis flow diagram showing the outcome of the initial and additional searches resulting in the full studies included in the review.