Original article

Diagnostic performance of micro-ultrasound versus multiparametric mri for clinically significant prostate cancer in active surveillance: a diagnostic test accuracy meta-analysis

Rendimiento diagnóstico del micro-ultrasonido versus la resonancia multiparamétrica para cáncer de próstata clínicamente significativo en vigilancia activa: un metaanálisis de exactitud diagnóstica

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Abstract

Objective: To compare the diagnostic performance of micro-ultrasound (mUS) versus multiparametric MRI (mpMRI) for identifying clinically significant prostate cancer (csPCa) in patients under active surveillance (AS).

Methodology: We conducted a systematic review and diagnostic test accuracy meta-analysis following PRISMA-DTA and the Cochrane Handbook for Diagnostic Reviews. Five databases were searched on November 22, 2024. Studies were eligible if they directly compared mUS and mpMRI in AS patients and provided extractable 2×2 diagnostic data. Pooled sensitivity, specificity, diagnostic odds ratios (DOR), and area under the curve (AUC) were estimated using bivariate random-effects models.

Results: Five studies comprising 339 AS patients met inclusion criteria. Pooled sensitivity of mUS was 96.2% (95% CI 90.2–98.5), compared with 87.8% (95% CI 70.7–95.5) for mpMRI. Specificity was 41.6% (95% CI 28.4–56.1) for mUS and 47.3% (95% CI 27.7–67.8) for mpMRI. AUC values were 0.84 for mUS and 0.79 for mpMRI (p = 0.73). DORs were similar (mUS: 9.9; mpMRI: 8.3). No major heterogeneity or publication bias was observed. Risk of bias ranged from moderate to serious across studies.

Limitations: Only five studies were included, two available solely as abstracts. Heterogeneity in csPCa definitions, imaging protocols, and biopsy techniques may limit generalizability.

Originality / Value: This is the first diagnostic meta-analysis focused exclusively on AS patients directly comparing mUS and mpMRI.

Conclusions: mUS demonstrates comparable diagnostic performance to mpMRI for detecting csPCa in AS patients, with slightly higher pooled sensitivity. These findings support mUS as a promising, accessible imaging alternative in AS pathways.

Keywords: Prostate cancer, Active surveillance, Micro-ultrasound, Multiparametric MRI, Meta-analysis, Diagnostic accuracy

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Resumen

Objetivo: Comparar el desempeño diagnóstico de la microecografía (mUS) frente a la resonancia magnética multiparamétrica (mpMRI) para identificar el cáncer de próstata clínicamente significativo (csPCa) en pacientes bajo vigilancia activa (AS).
Metodología: Realizamos una revisión sistemática y un metaanálisis de la precisión de las pruebas diagnósticas siguiendo las directrices PRISMA-DTA y el Manual Cochrane para revisiones diagnósticas. Se realizaron búsquedas en cinco bases de datos el 22 de noviembre de 2024. Los estudios eran elegibles si comparaban directamente la mUS y la mpMRI en pacientes con AS y proporcionaban datos diagnósticos 2×2 extraíbles. Se estimaron la sensibilidad, la especificidad, las odds ratios diagnósticas (DOR) y el área bajo la curva (AUC) combinadas utilizando modelos de efectos aleatorios bivariados.
Resultados: Cinco estudios con 339 pacientes con EA cumplieron los criterios de inclusión. La sensibilidad combinada de la ecografía móvil fue del 96,2 % (IC del 95 %: 90,2-98,5), en comparación con el 87,8 % (IC del 95 %: 70,7-95,5) de la resonancia magnética multiparamétrica. La especificidad fue del 41,6 % (IC del 95 %: 28,4-56,1) para la ecografía magnética y del 47,3 % (IC del 95 %: 27,7-67,8) para la resonancia magnética multiparamétrica. Los valores del AUC fueron de 0,84 para la ecografía magnética y de 0,79 para la resonancia magnética multiparamétrica (p = 0,73). Los DOR fueron similares (mUS: 9,9; mpMRI: 8,3). No se observó una heterogeneidad importante ni un sesgo de publicación. El riesgo de sesgo osciló entre moderado y grave en todos los estudios.
Limitaciones: Solo se incluyeron cinco estudios, dos de los cuales solo estaban disponibles en forma de resúmenes. La heterogeneidad en las definiciones de csPCa, los protocolos de imagen y las técnicas de biopsia puede limitar la generalización.
Originalidad/valor: Este es el primer metaanálisis diagnóstico centrado exclusivamente en pacientes en AS que compara directamente la mUS y la mpMRI.
Conclusiones: La mUS demuestra un rendimiento diagnóstico comparable al de la mpMRI para detectar el csPCa en pacientes en AS, con una sensibilidad combinada ligeramente superior. Estos hallazgos respaldan la mUS como una alternativa de imagen prometedora y accesible en las vías de AS.

Palabras clave:
Cáncer de próstata, Vigilancia activa, Microecografía, Resonancia magnética multiparamétrica, Metaanálisis, Precisión diagnóstica

Background

Active surveillance (AS) is an established management strategy for patients with low-risk prostate cancer, aiming to delay or avoid definitive treatment while maintaining oncologic safety. Multiparametric magnetic resonance imaging (mpMRI) has emerged as a cornerstone imaging modality in AS protocols, due to its high negative predictive value and its ability to localize clinically significant prostate cancer (csPCa). However, mpMRI is resource-intensive, operator-dependent, and its interpretation can vary across institutions.[1,2]

In recent years, high-resolution micro-ultrasound (mUS), operating at 29 MHz, has

emerged as a promising alternative for real-time prostate imaging. Its feasibility for detecting prostate cancer was demonstrated as early as 2014,[3] and preliminary studies suggest that it may offer diagnostic accuracy comparable to mpMRI, with added advantages such as accessibility and lower cost.[4,5] To aid interpretation, mUS utilizes the Prostate Risk Identification using Micro-Ultrasound (PRI-MUS) score, a 5-point scale analogous to Prostate Imaging Reporting and Data System (PI-RADS) used in mpMRI, which categorizes lesion risk and guides targeted biopsy.[6] Despite these potential benefits, the diagnostic performance of mUS remains incompletely understood, particularly in the context of AS, where imaging plays a critical role in identifying disease progression.[7]

To date, no comprehensive diagnostic meta-analysis has systematically compared the sensitivity and specificity of mUS versus mpMRI for the detection of csPCA among patients under AS. Therefore, we aimed to perform a diagnostic test accuracy meta-analysis to evaluate and compare the performance of mUS and mpMRI in detecting csPCa in the active surveillance population.

Materials and methods

This systematic review and diagnostic meta-analysis was conducted in accordance with the Cochrane Handbook for Systematic Reviews of Diagnostic Test Accuracy and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-DTA) guidelines.[7,8] The protocol was registered in PROSPERO on January 10, 2025 (ID: CRD42025636921). Although the original protocol aimed to evaluate all patients with clinically significant prostate cancer, the scope of the review was refined during the study to focus specifically on patients under AS, based on data availability and clinical relevance. This modification was made prior to data extraction and analysis, is transparently reported, and does not affect the methodological integrity of the review.

Although the original protocol aimed to evaluate all patients with clinically significant prostate cancer, the scope was refined to focus exclusively on patients under active surveillance (AS). This decision was based on two rationales: (1) the AS population represents a clinically homogeneous cohort in which imaging serves a well-defined surveillance role, and (2) limiting the analysis to AS patients enabled a more valid direct comparison of mUS and mpMRI within the same clinical context, avoiding the heterogeneity introduced by including diagnostic populations without prior cancer history. This refinement was made transparently prior to data extraction and analysis, strengthening the clinical relevance and interpretability of the findings without compromising methodological rigor.

Active surveillance represents a distinct clinical context in which patients with confirmed low-risk or favorable intermediate-risk prostate cancer are monitored for disease progression. This distinction is clinically meaningful and affects the interpretation of test performance. Including both diagnostic populations (patients without prior cancer) and surveillance populations (AS patients) would introduce significant clinical and statistical heterogeneity. Different prevalence of csPCa, different imaging protocols, and different clinical decision thresholds apply in these two contexts. Focusing on AS patients creates a more homogeneous cohort for valid comparison. Both mUS and mpMRI are

increasingly used within AS protocols to guide re-biopsy decisions. A head-to-head comparison in this specific population directly informs real-world clinical practice. Current guidelines (AUA, EAU) emphasize the role of imaging in AS, making this population highly relevant

Inclusion and exclusion criteria

Inclusion in this meta-analysis was restricted to studies that met all of the following criteria:

(1) the study population consisted of men under active surveillance for prostate cancer;
(2) the study compared mUS with mpMRI;
(3) it reported outcomes of interest;
(4) sufficient data were available to construct a 2×2 contingency table (i.e., true-positive, false-positive, false-negative, and true-negative values);
(5) both conference abstracts and full-text publications were considered;
(6) studies published in English or Spanish were included.

Studies were excluded from this meta-analysis if they met any of the following criteria:

(1) the study population was not relevant, including those not under active surveillance or without a confirmed diagnosis of prostate cancer;
(2) there was no direct comparison between mUS and mpMRI;
(3) the study did not report outcomes of interest;
(4) it was a review article or a meta-analysis;
(5) the study was published in a language other than English or Spanish;
(6) it involved a population overlapping with another included study.

Search strategy

We systematically searched PubMed, Cochrane Library, Web of Science, Scopus, and ClinicalTrials.gov on November 22, 2024. The search included terms related to prostate cancer ("prostate cancer", "prostatic carcinoma", "prostate adenocarcinoma", "prostatic neoplasms") in combination with micro-ultrasound ("micro-ultrasound", "high-resolution ultrasound", "micro-US") and multiparametric MRI ("multiparametric MRI", "mpMRI", "functional MRI", "DCE-MRI"). The search strategy, without restricting terms to "active surveillance", helped capture the full breadth of relevant literature, including studies that reported outcomes for this population as a subgroup. No filters or language restrictions were applied. Additionally, references from all included studies, previous systematic reviews, and meta-analyses were manually reviewed to identify any additional relevant studies. Two authors (RR and EB) independently extracted baseline characteristics and diagnostic outcomes using a standardized data collection form, which was reviewed by a third author (MR). Discrepancies were resolved by consensus.

Outcomes

The primary outcome of this diagnostic meta-analysis was the detection of csPCa in patients under AS. Active surveillance is defined as a management strategy for men with low-risk or favorable intermediate-risk prostate cancer, in which curative treatment is deferred while the disease is closely monitored through serial prostate-specific antigen (PSA) testing, digital rectal examinations (DRE), imaging, and repeat biopsies. Clinically significant prostate cancer was defined according to criteria

used in the original studies, most commonly as International Society of Urological Pathology (ISUP) grade group ≥2 (Gleason score ≥3+4). Diagnostic performance was evaluated based on sensitivity and specificity as reported or derived from the included studies. No subgroup analyses were performed.

Risk of bias assessment

Risk of bias and applicability concerns were assessed using the QUADAS-2 (Quality Assessment of Diagnostic Accuracy Studies, version 2) tool, which is the recommended instrument for diagnostic test accuracy studies as endorsed by the Cochrane Handbook for Systematic Reviews of Diagnostic Test Accuracy and the PRISMA-DTA statement9. One reviewer (AG) independently evaluated each included study across the four risk-of-bias domains (patient selection, index test, reference standard, and flow and timing) and the three applicability domains (patient selection, index test, and reference standard). Each domain was judged as low, unclear, or high risk based on signaling questions tailored to the review question.[8,9]

Statistical analysis

All statistical analyses were performed using R software (version 4.4.2, R Foundation for Statistical Computing). The meta-analysis was conducted using the meta, metafor, mada, and dmetatools packages.[10–14]

We performed both univariate and bivariate meta-analyses to assess the diagnostic performance of mUS and mpMRI for csPCa in men under AS. Sensitivity and specificity were pooled using a random-effects model (method = "PLOGIT", confidence intervals with Clopper-Pearson method). Forest plots were constructed for each imaging modality to visualize the pooled sensitivity and specificity.

Bivariate random-effects meta-analysis models were fitted using the reitsma function from the mada package.[15] Summary receiver operating characteristic (SROC) curves were generated, and the AUC and partial AUCs were calculated as overall measures of diagnostic accuracy. Additionally, bootstrapped AUCs and 95% confidence intervals were estimated using the AUC_boot function from the dmetatools package (2000 replications).

To assess DOR, we conducted random-effects meta-analyses using the inverse variance method with the metabin function. Funnel plots were constructed to evaluate publication bias. However, due to the limited number of included studies (k = 5 per group), statistical tests for small-study effects such as Deeks' asymmetry test were not performed, as they require a minimum of six studies.

Threshold effects were explored by calculating the correlation between logit-transformed sensitivity and specificity values for each modality, in order to assess potential trade-offs in test performance across studies.

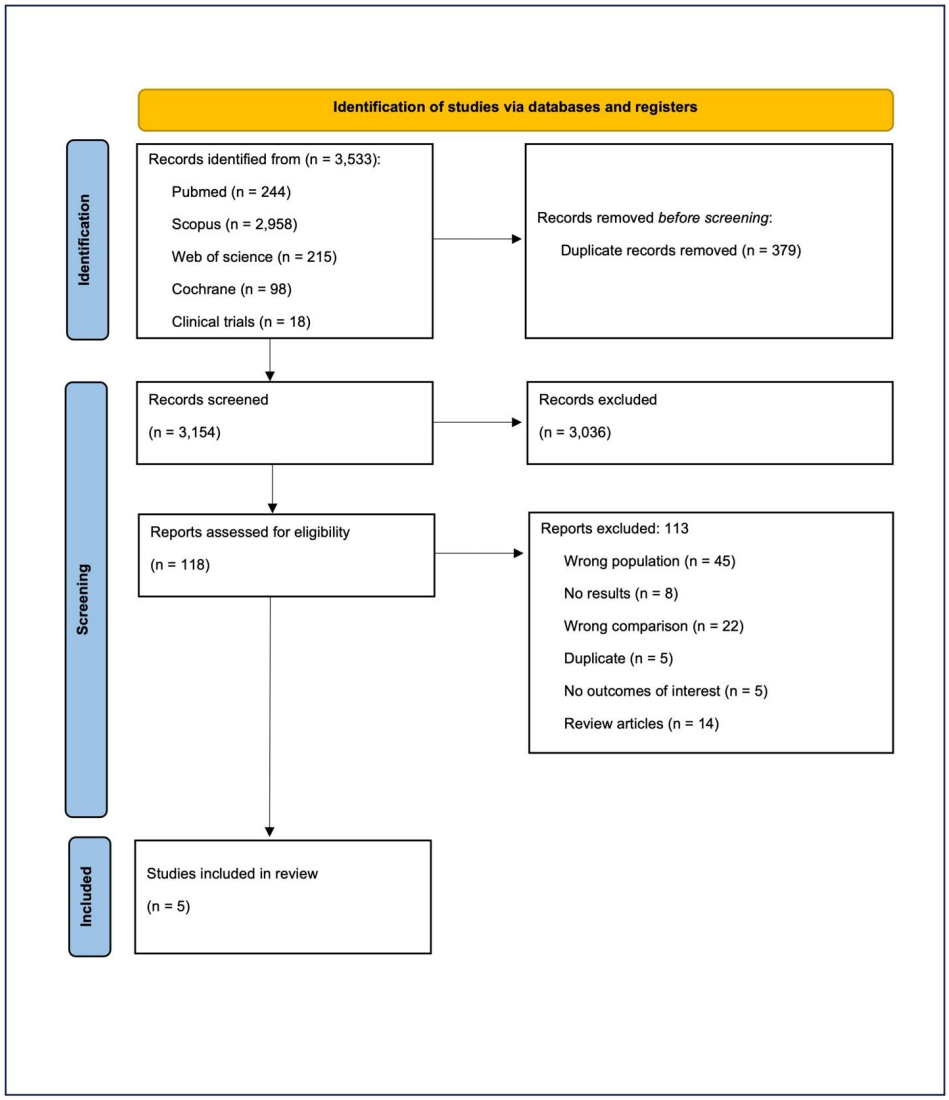
A meta-regression was subsequently conducted using generalized linear mixed-effects models (GLMM), implemented through the glmer function in the lme4 package.[16] This model included fixed effects for test type (mUS vs mpMRI) and random slopes for sensitivity and specificity at the study level (grouped by study ID), allowing for between-study heterogeneity in diagnostic performance.

All statistical procedures were conducted in accordance with best practices for diagnostic test accuracy meta-analyses, following the PRISMA-DTA reporting framework.

Results

A total of 3,533 records were identified through database searches. After removing 379 duplicates, 3,154 titles and abstracts were screened, resulting in 118 articles selected for full-text review. Of these, 113 were excluded, most commonly due to the absence of data specific to patients under active surveillance. Ultimately, 5 studies met all inclusion criteria and were included in the final meta-analysis (Figure 1).

Figure 1. PRISMA flow diagram of study selection



Flow diagram summarizing the systematic search, screening, and inclusion process for studies comparing micro-ultrasound and multiparametric MRI in active surveillance for prostate cancer.

The meta-analysis included 339 patients with prostate cancer under active surveillance, all of whom underwent both mUS and mpMRI. Patient age ranged between 62 and 66 years, and PSA levels between 6 and 8.5 ng/mL. Abnormal DRE findings were present in up to 22%, though not consistently reported. Lesions categorized as PI-RADS ≥3 were observed in 33–92% of mpMRI cases, while PRI-MUS ≥3 lesions were found in 56–82% of patients evaluated with mUS. Data on prostate volume and family history were variably reported (Table 1).

Table 1. Baseline characteristics of the included studies

Study	Design	Blinding Status†	Population	Intervention	Comparison	No. of patients (mUS/mpMRI)	Age (years)*	Total PSA (ng/mL)*	Abnormal DRE, n (%)	Prostatic vol. (ml)*	No. of patients ≥ PI-RADS 3, n (%)	No. of patients ≥ PRIMUS 3, n (%)
Eure 2019. (17)	PCS	Blinded	PCa on AS	mUS	mpMRI	9 (9/9)	66 [54 – 75]	6 [4.71 – 7.86]	2 (22.2)	39 [25-53]	3 (33)	5 (56)
Staermann 2019.(18)	Conf. Abs.	Unblinded	PCa on AS	mUS	mpMRI	39 (39/39)	NA	NA	NA	NA	NA	NA
Maffei 2023. (19)	PCS	Blinded	PCa on AS	mUS	mpMRI	100 (100/100)	64 (60–71)	7 (4.81–9.36)	14 (14)	49.13 (37–67)	92 (92)	82 (82)
Albers 2022. (20)	PCS	Unblinded	PCa on AS	mUS	mpMRI	128 (128/128)	66 ± (6.1)	8.5 [4.2-40]	19 (15)	7.8 (5.3–10.7)	73 (57)	97 (76)
Albers 2024. (21)	Conf. Abs.	Unblinded	PCa on AS	mUS	mpMRI	63 (63/63)	62.2 (mean)	7.4 (median)	NA	NA	27 (43)	36 (57)

Note: The data in the columns without "mUS/mpMRI'" refers to the total number of patients. The data labeled as "mUS/mpMRI" correspond to the subgroups of patients undergoing mUS and mpMRI.

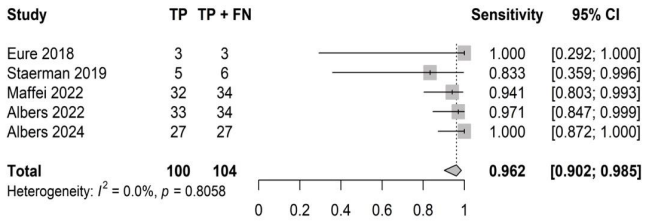
NA= not available; Conf. Abs. = conference abstract; PCS = prospective cohort study; mUS = microultrasound; mpMRI = multiparametric magnetic resonance; DRE = digital rectal examination; PCa = prostate cancer; AS = active surveillance; PSA = prostate specific antigen; Vol. = volume;

*Mean ± standard deviation or mean{range}or median (interquartil range) or median [range]; † Blinded to magnetic resonance results

Diagnostic performance of mUS and mpMRI

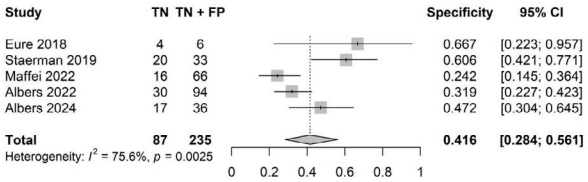
Pooled sensitivity for mUS was estimated at 96.2% (95% CI: 90.2–98.5; Figure 2), while specificity was 41.6% (95% CI: 28.4–56.1; Figure 3).

Figure 2. Forest plot of pooled sensitivity for micro-ultrasound



Sensitivity estimates with 95% confidence intervals for mUS in detecting clinically significant prostate cancer across five studies. Pooled using a random-effects model. Squares represent point estimates; horizontal lines denote confidence intervals. TP = true positives; FN = false negatives.

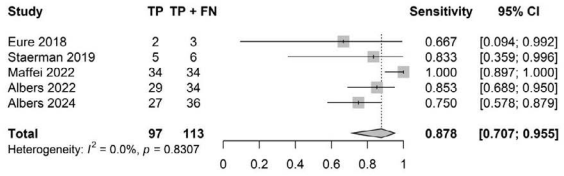
Figure 3. Forest plot of pooled specificity for micro-ultrasound



Specificity estimates with 95% confidence intervals for mUS in detecting csPCa across five studies. Pooled using a random-effects model. Squares represent point estimates; horizontal lines denote confidence intervals. TN = true negatives; FP = false positives.

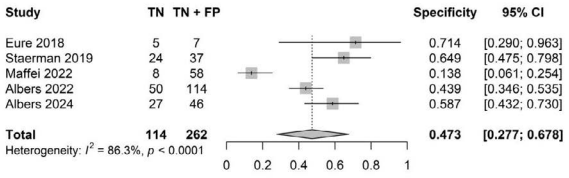
For mpMRI, pooled sensitivity was 87.8% (95% CI: 70.7–95.5; Figure 4) and specificity 47.3% (95% CI: 27.7–67.8; Figure 5). Forest plots confirmed consistency of results across the included studies.

Figure 4. Forest plot of pooled sensitivity for multiparametric MRI



Sensitivity estimates with 95% confidence intervals for mpMRI in detecting csPCa across five studies. Pooled using a random-effects model. Squares represent point estimates; horizontal lines denote confidence intervals. TP = true positives; FN = false negatives.

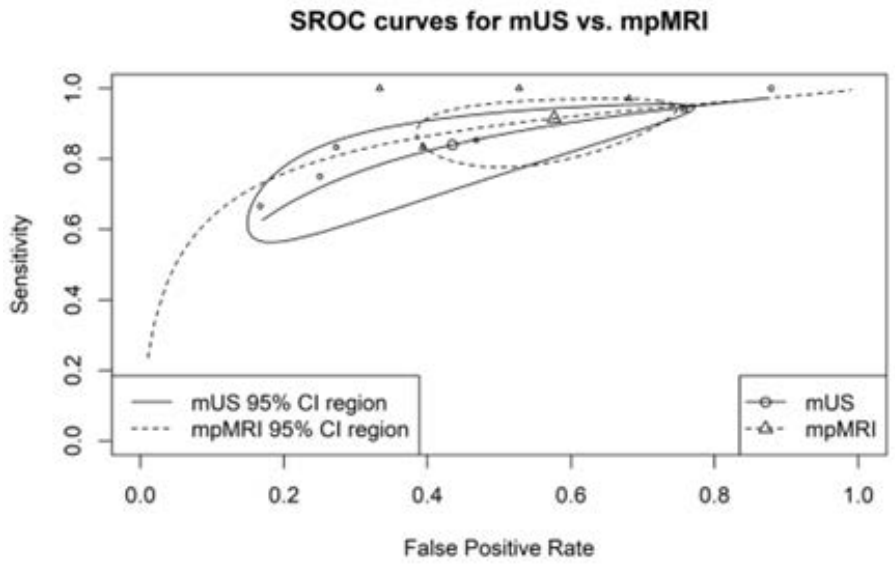
Figure 5. Forest plot of pooled specificity for multiparametric MRI



Specificity estimates with 95% confidence intervals for mpMRI in detecting csPCa across five studies. Pooled using a random-effects model. Squares represent point estimates; horizontal lines denote confidence intervals.TN = true negatives; FP = false positives.

Using a bivariate model, the area under the summary receiver operating characteristic curve (AUC) was 0.84 for mUS (95% CI: 0.50–0.91) and 0.79 (95% CI: 0.63–0.86) for mpMRI (Figure 6).

Figure 6. Summary receiver operating characteristic (SROC) curves for mUS and mpMRI



Bivariate SROC curves comparing diagnostic performance of micro-ultrasound and multiparametric MRI for detecting csP-Ca. Shaded areas represent 95% confidence regions. AUCs were 0.84 for mUS and 0.79 for mpMRI.

The difference in AUC between the two modalities was not statistically significant (p = 0.73).

Pooled diagnostic odds ratios (DOR) were also similar: 9.9 (95% CI: 3.8–25.9) for mUS and 8.3 (95% CI: 4.2–16.1) for mpMRI, supporting comparable overall discriminative ability. No statistically significant heterogeneity was detected in the DOR analyses for either modality (I^2 = 0%, p > 0.70 for both). However, due to the limited number of included studies, the analysis may have been underpowered to detect moderate heterogeneity, and these findings should be interpreted with caution.

Meta-regression models did not show a significant difference in diagnostic performance between mUS and mpMRI. Funnel plots did not suggest major publication bias, although formal testing was not performed given the small number of studies.

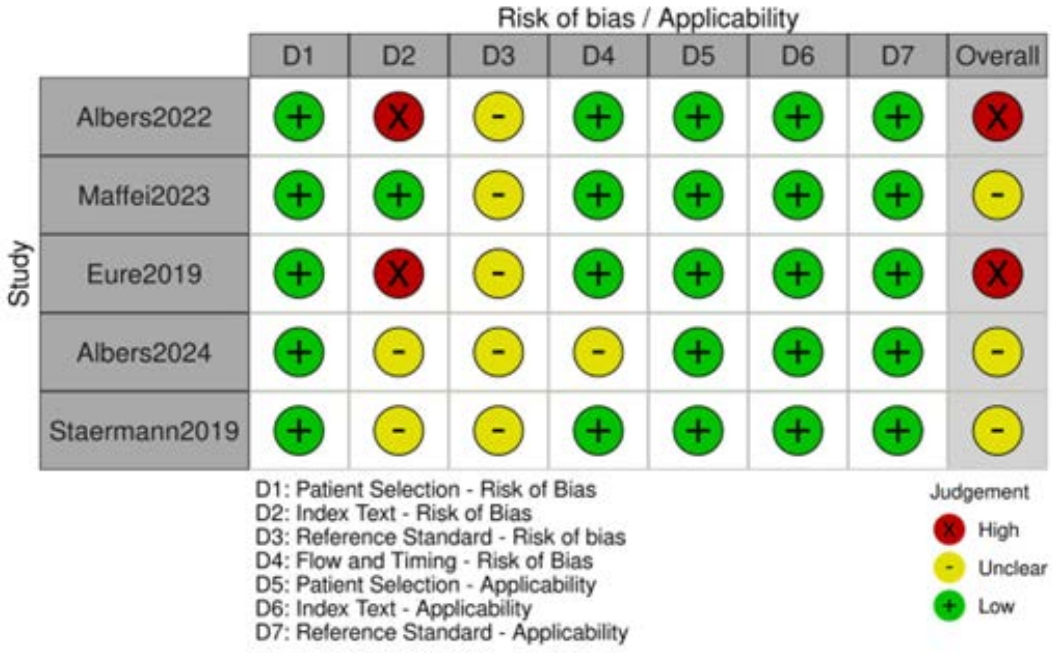
Finally, analysis of threshold effects showed a moderate positive correlation between logit-transformed sensitivity and specificity for mUS, and a strong negative correlation for mpMRI, possibly reflecting variability in interpretation thresholds across studies.

Risk of bias across studies

Two studies, Albers (2022) and Eure (2019),[17,20] were found to have a high overall risk of bias, in both cases driven by the Index Test domain: Albers 2022 explicitly reported that the urologist performing the micro-ultrasound was not blinded to the pre-biopsy mpMRI, and in Eure conventional TRUS and 29-MHz micro-ultrasound were performed consecutively by the same operator without effective separation between readings. The remaining three studies, were rated as having an unclear overall risk of bias. Maffei adequately blinded the mUS operator to the mpMRI but did not specify whether the uropathologist was

blinded to imaging findings; Albers 2024, available only as a conference abstract of an ongoing trial, did not detail the blinding protocol and reported incomplete enrolment at the time of analysis; and Staerman, also a multicentre congress abstract, did not describe the operator-blinding strategy and the authors themselves acknowledged that the biopsy template was not standardized across sites. Patient selection was rated at low risk of bias in all five studies, and applicability concerns were low across the three QUADAS-2 applicability domains, since the populations, index tests (PI-RADS v2/v2.1 and PRI-MUS), and reference standard (targeted plus systematic biopsy histopathology) reflect current academic urological practice. A visual summary of these judgements is presented as a traffic light plot (Figure 7).

Figure 7. Traffic light plot of risk of bias and applicability across included studies



This figure summarizes the domain-level judgements obtained with the QUADAS-2 tool. Each row represents a study; columns D1–D4 correspond to the risk-of-bias domains and columns D5–D7 to the applicability domains.

Discussion

This meta-analysis evaluated the diagnostic performance of mUS compared to mpMRI for the detection of csPCa in men under active surveillance. Based on five studies including 339 patients,[17–21] mUS demonstrated a pooled sensitivity of 96.2% and AUC of 0.84, while mpMRI showed a sensitivity of 87.8% and an AUC of 0.79. Although mUS showed slightly higher sensitivity and AUC values, the difference between the two modalities was not statistically significant. Both techniques

demonstrated comparable DORs, and no significant heterogeneity or publication bias was observed.

Recent evidence has highlighted the central role of mpMRI in the management of AS patients, particularly for initial risk stratification and targeted biopsy.[22] However, its cost, limited accessibility, and need for radiologic expertise have prompted investigation into alternative imaging strategies. Micro-ultrasound, with its real-time imaging capability and higher spatial resolution (29 MHz), offers a potentially attractive, office-based alternative.[23]

Our findings align with previous works that reported promising sensitivity of mUS for csPCa detection.[24] The current study extends these findings specifically to patients on AS, suggesting that mUS may offer comparable diagnostic performance to mpMRI in this context. Importantly, while prior head-to-head comparisons have often included mixed-risk populations or focused on initial diagnosis, our study uniquely focuses on the AS cohort, a group where imaging accuracy is particularly critical due to the preference for avoiding overtreatment.

From a practical standpoint, mUS could be particularly beneficial in resource-limited settings or where access to high-quality mpMRI is constrained. Its use may reduce delays in imaging and allow for same-day biopsy planning, potentially improving adherence to AS protocols. This is especially relevant given that the American Urological Association (AUA) recommends the use of mpMRI to support risk stratification in men undergoing active surveillance, particularly prior to confirmatory biopsy, while emphasizing that it should not replace periodic biopsies.[25] Similarly, the European Association of Urology (EAU) guidelines highlight the increasing role of imaging typically mpMRI in AS follow-up strategies.[26]

Although the DOR analysis did not reveal significant heterogeneity ($I^2 = 0\%$), substantial heterogeneity was observed in the specificity of mpMRI ($I^2 = 86.3\%$), in contrast to the greater consistency observed with mUS. This variability may reflect important methodological differences among the included studies, including variability in the interpretation of PI-RADS. The classification of PI-RADS ≥3 lesions as indicative of prostate cancer may vary among radiologists and institutions, affecting the false-positive rate.[27,28] Heterogeneous acquisition protocols with differences in field strength (1.5T vs. 3T), the use of a rectal coil, and the sequences employed can affect diagnostic specificity.[29] Operator experience in mpMRI is highly operator-dependent, and the learning curve can affect diagnostic accuracy.[30] Finally, variable decision thresholds in studies may have used different cutoff points to define "positive" findings, creating a threshold effect that artificially increases heterogeneity.[31]

While mUS showed promising diagnostic accuracy, current evidence is still insufficient to determine whether it can match mpMRI in all clinical scenarios particularly for lesions in challenging locations such as the anterior prostate or in patients with prior biopsies. The comparative strengths and limitations of each modality remain to be better defined in the context of active surveillance, and further studies are needed to clarify their respective roles.

This meta-analysis has several limitations. First, the small number of included studies limits statistical power and precludes subgroup analyses. Second, study quality was variable: two were available only as abstracts, and risk of bias was moderate to serious in all cases. Fina-

lly, clinical heterogeneity in csPCa definitions, imaging protocols, and biopsy strategies may limit the generalizability of pooled estimates. These findings should be interpreted with caution and validated in future prospective studies.

In addition, the marked heterogeneity in mpMRI specificity (I^2 = 86.3%) suggests methodological or interpretive inconsistencies that could not be fully explored through subgroup analyses due to the limited number of studies. This variability reinforces the need for standardization in imaging protocols and reporting systems (such as PI-RADS v2.1) to improve the reproducibility of results.

Conclusion

In this diagnostic meta-analysis of patients under active surveillance for prostate cancer, micro-ultrasound demonstrated comparable diagnostic performance to multiparametric MRI for the detection of clinically significant disease. While mUS showed slightly higher pooled sensitivity and similar overall accuracy, the difference between the two modalities was not statistically significant. The lower variability in the sensitivity and specificity of mUS compared with mpMRI may suggest greater inter-observer reproducibility, a potential advantage for its implementation in settings with limited access to specialized radiology. However, formal inter-observer agreement studies are needed to confirm this hypothesis.

CRediT taxonomy

- Conceptualization: Eduardo Barrera-Juárez, Rodrigo Rodríguez-Monroy, Javier González-Reyes
- Methodology: Eduardo Barrera-Juárez, Rodrigo Rodríguez-Monroy, Efraín Valadez-Padilla
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- Investigation: Eduardo Barrera-Juárez, Rodrigo Rodríguez-Monroy, Javier González-Reyes
- Data curation: Eduardo Barrera-Juárez, Rodrigo Rodríguez-Monroy, Manuel G. Ruelas-Martínez
- Writing – Original Draft: Rodrigo Rodríguez-Monroy, Abelardo González-Medina, Eduardo César Ortiz-García
- Writing – Review & Editing: Eduardo Barrera-Juárez, Efraín Valadez-Padilla, Manuel G. Ruelas-Martínez

Supervision: Eduardo Barrera-Juárez

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Conflict of interest

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