

A Systemic Review and Meta-analysis of Intravesical Prostatic Protrusion in determining BOO and unsuccessful TWOC

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INTRODUCTION

- ❖ UDS is the gold standard for diagnosing BOO, but the routine use is limited by the invasiveness nature, costs and inefficiency in outpatient settings
- ❖ Various clinical parameters have been studied (Prostate volume, uroflowmetry, residual urine, bladder wall thickness), but with limited accuracies
- ❖ The role of intravesical prostatic protrusion (IPP) to determine BOO has been studied, but lacked strong evidence to support routine clinical utility

OBJECTIVE

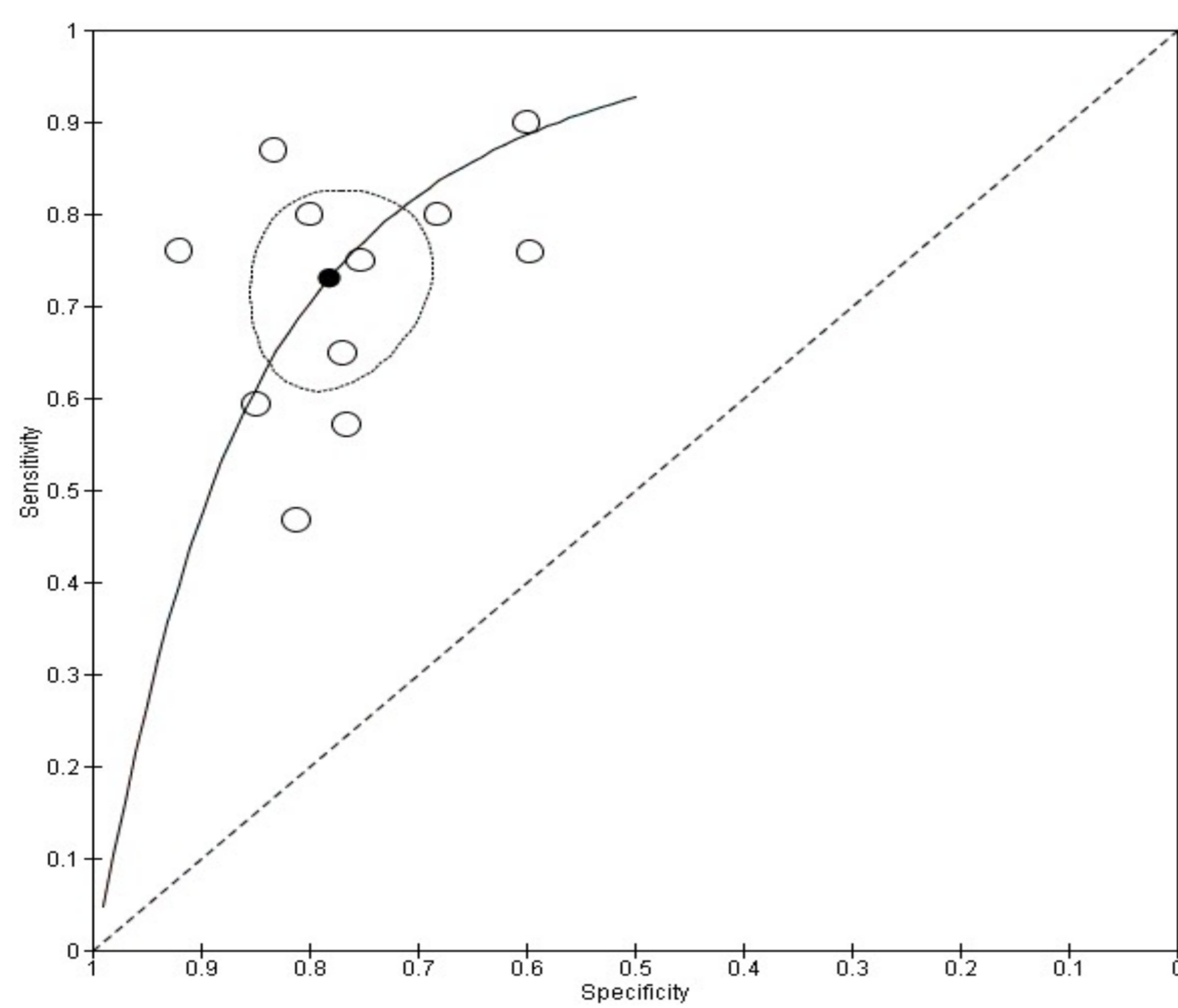
- ❖ This study aims to update the current evidence on the predictive role of intravesical prostatic protrusion (IPP) in determining UDS-proven BOO and unsuccessful trial without catheter (TWOC)

MATERIALS AND METHODS

- ❖ Based on PRISMA guidelines, a literature search of PubMed/MEDLINE, EMBASE and Cochrane library up to January 2021 was performed
- ❖ 465 articles were identified and 18 studies (n=4128) were recruited based on predefined parameters (11 studies evaluated UDS-proven BOO, 7 studies evaluated unsuccessful TWOC)
- ❖ Quality of studies was assessed and Risk of Bias evaluated
- ❖ AUROCs were generated to determine the diagnostic accuracy of IPP, and pooled Sensitivity and Specificity determined with an IPP cutoff of 10mm. Probability modifying plots were employed to determine the pre- and post-test adjusted likelihood ratios (LR).

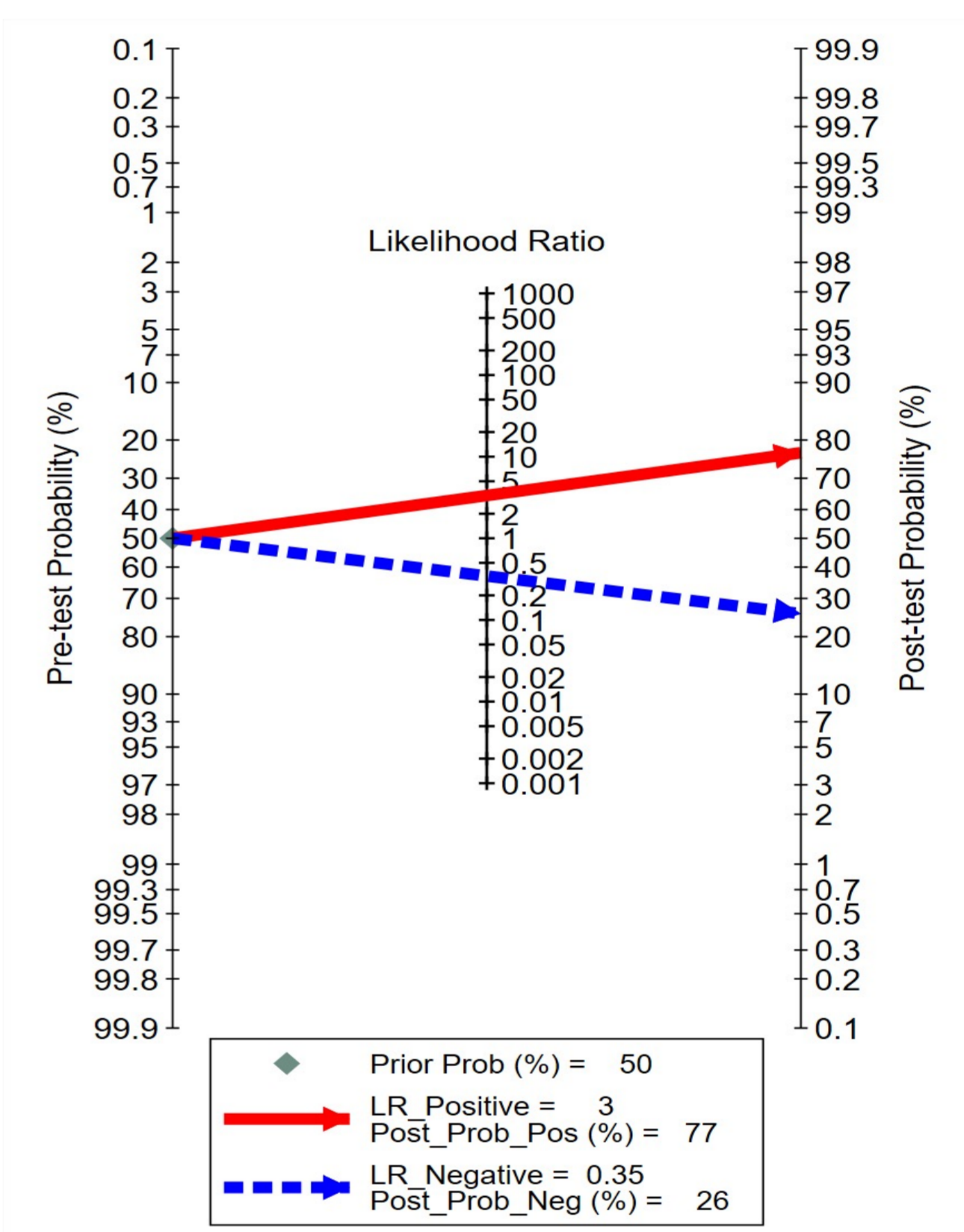
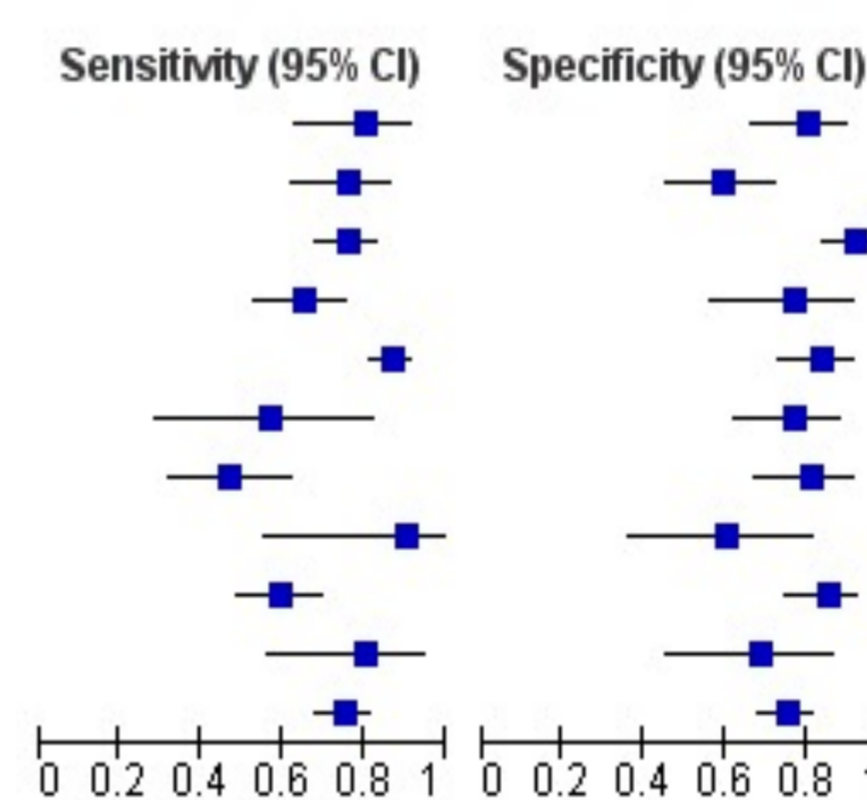
RESULTS

IPP in determining UDS-proven BOO



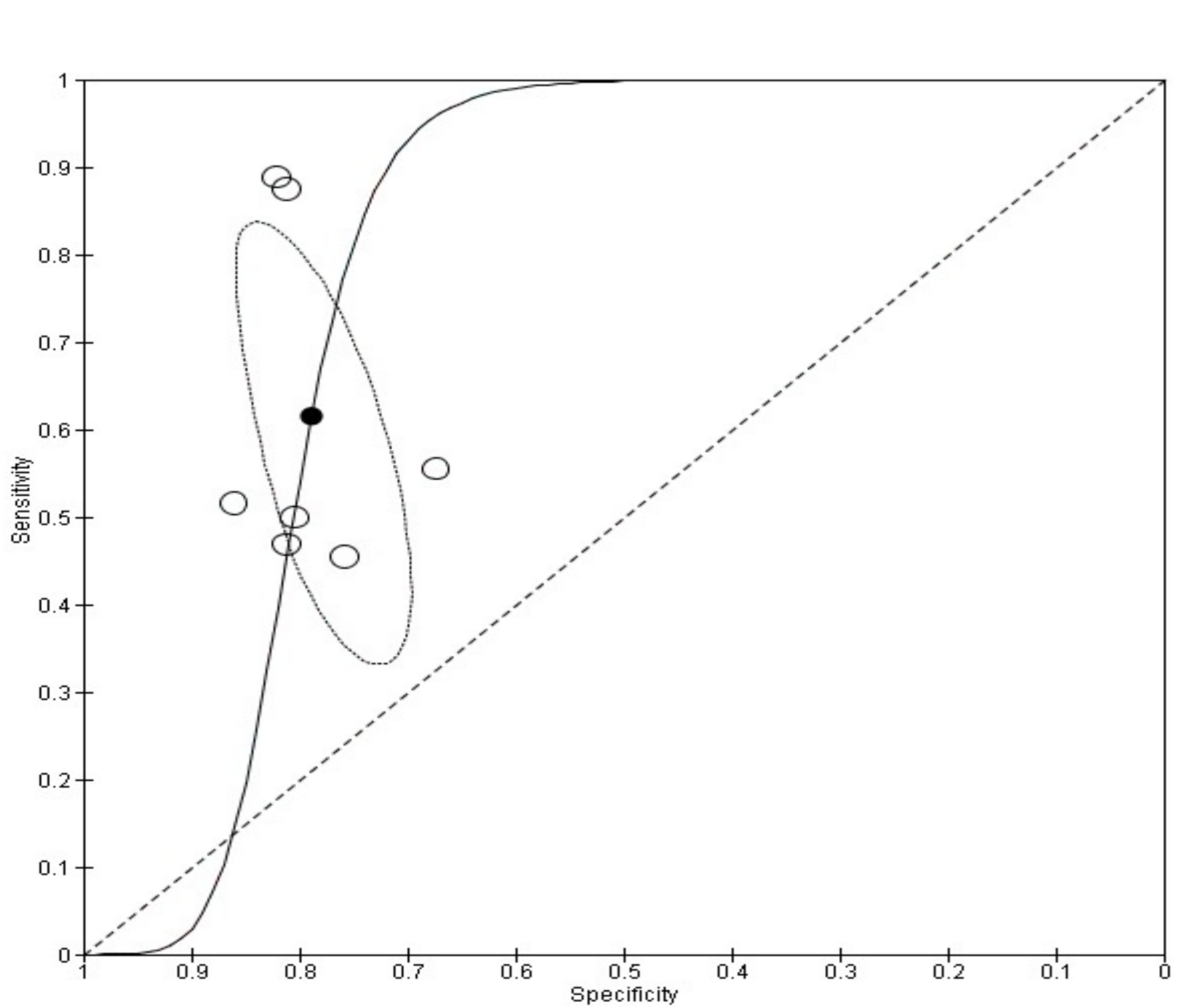
UDS

Study	TP	FP	FN	TN	cutoff	Sensitivity (95% CI)	Specificity (95% CI)
Abdel-Aal 2011	28	10	7	40	8	0.80 [0.63, 0.92]	0.80 [0.66, 0.90]
Aganovic 2012	41	23	13	34	10	0.76 [0.62, 0.87]	0.60 [0.46, 0.72]
Chia 2002	95	6	30	69	10	0.76 [0.68, 0.83]	0.92 [0.83, 0.97]
Franco 2010	48	6	26	20	12	0.65 [0.53, 0.76]	0.77 [0.56, 0.91]
Garg 2019	146	12	22	60	7.5	0.87 [0.81, 0.92]	0.83 [0.73, 0.91]
Lee 2016	8	11	6	36	10	0.57 [0.29, 0.82]	0.77 [0.62, 0.88]
Lim 2006	22	9	25	39	10	0.47 [0.32, 0.62]	0.81 [0.67, 0.91]
Nose 2004	9	8	1	12	10	0.90 [0.55, 1.00]	0.60 [0.36, 0.81]
Reddy 2019	54	11	37	62	10	0.59 [0.49, 0.70]	0.85 [0.75, 0.92]
Reis 2008	16	7	4	15	10	0.80 [0.56, 0.94]	0.68 [0.45, 0.86]
Suzuki 2016	135	42	45	128	10	0.75 [0.68, 0.81]	0.75 [0.68, 0.82]



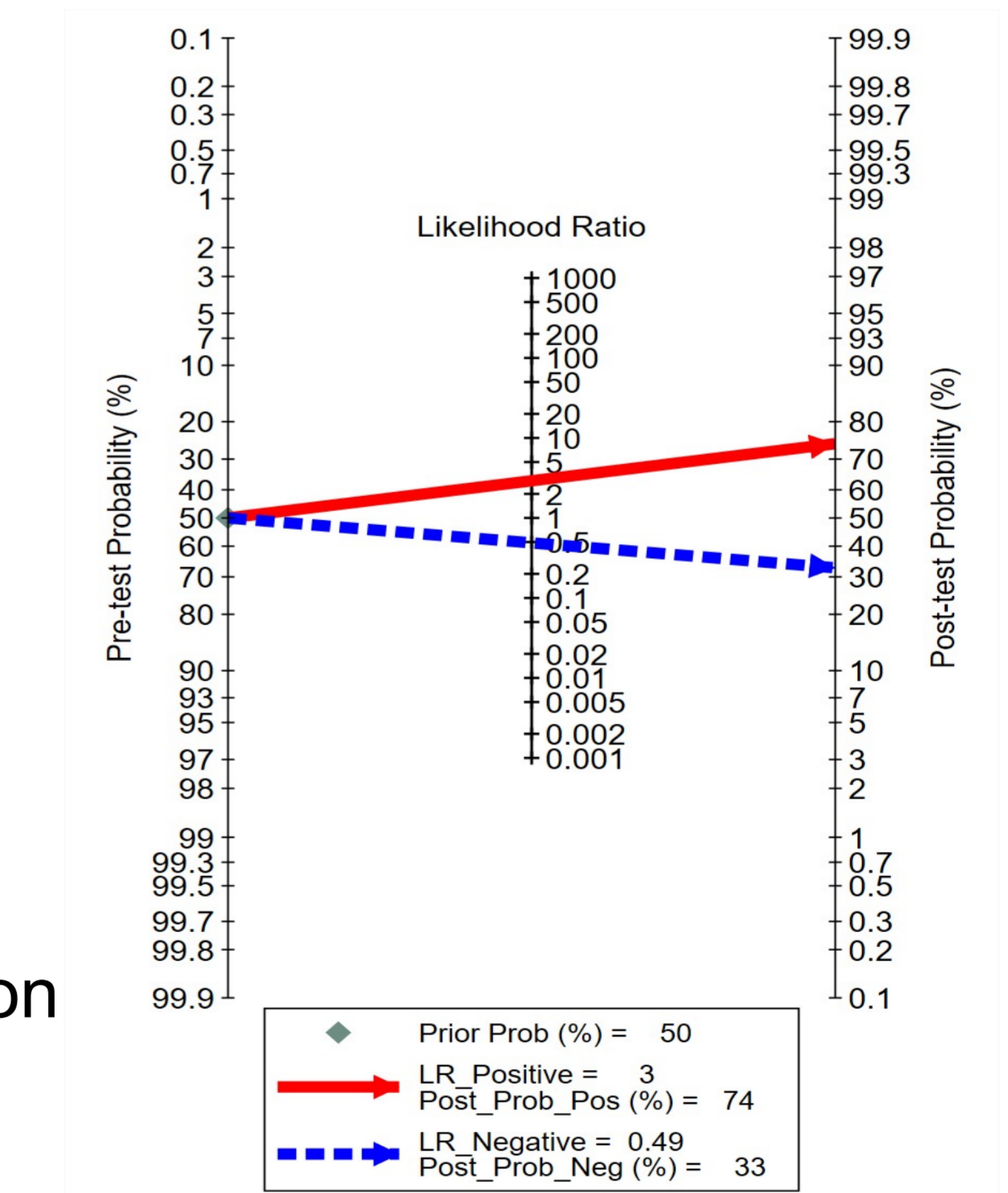
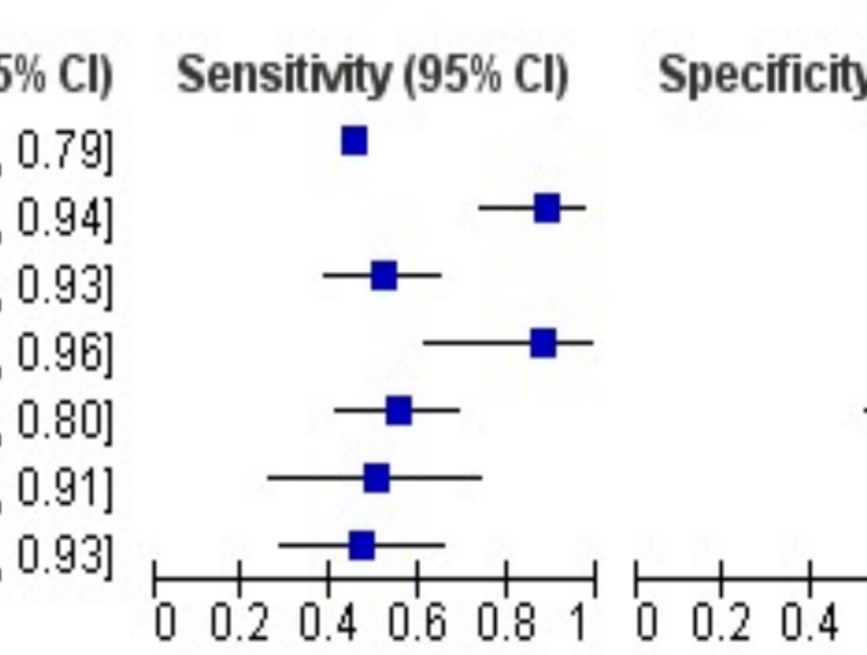
- ❖ 11 studies with 1478 patients were available for analysis
- ❖ Pooled AUROC in determining BOO was 0.83 (95% CI: 0.79 – 0.86)
- ❖ At IPP >10mm, the reported Sn was 0.71 (95%CI: 0.61-0.78), Sp 0.77 (95% CI: 0.68-0.84)
- ❖ Probability modifying plots showed LR+ of 3.34 and LR- of 0.35. Based on pretest probability of 0.50, IPP>10mm increases risks of BOO to 77%, while IPP<10mm, reduces risks to 26%

IPP in determining unsuccessful TWOC



TWOC

Study	TP	FP	FN	TN	cutoff	Sensitivity (95% CI)	Specificity (95% CI)
Bansal 2017	659	178	792	559	10	0.45 [0.43, 0.48]	0.76 [0.73, 0.79]
Bhomi 2011	32	5	4	23	8	0.89 [0.74, 0.97]	0.82 [0.63, 0.94]
De Nunzio 2020	33	11	31	68	10	0.52 [0.39, 0.64]	0.86 [0.76, 0.93]
Sharis 2012	14	3	2	13	10	0.88 [0.62, 0.98]	0.81 [0.54, 0.96]
Tan 2003	30	15	24	31	10	0.56 [0.41, 0.69]	0.67 [0.52, 0.80]
Teck 2012	9	8	9	33	10	0.50 [0.26, 0.74]	0.80 [0.65, 0.91]
Tiong 2008	15	6	17	26	10	0.47 [0.29, 0.65]	0.81 [0.64, 0.93]



- ❖ 7 studies with 2650 patients were available for analysis
- ❖ Pooled AUROC for unsuccessful TWOC was 0.74 (95% CI: 0.70–0.84)
- ❖ At IPP >10mm, the reported Sn was 0.51 (95%CI: 0.43-0.60), Sp 0.79 (95% CI: 0.73-0.84)
- ❖ Probability modifying plots showed LR+ of 2.91 and LR- of 0.49. Based on pretest probability of 0.50, IPP>10mm increases risks of unsuccessful TWOC to 74%, while IPP<10mm, reduces risks to 33%

Secondary analysis

- ❖ 5 studies compared Prostate volume and IPP in determining UDS-proven BOO, which comprised 824 patients
- ❖ The pooled AUC of PV was 0.71 (95% CI: 0.67-0.75), which was statistically lower than the pooled AUC of IPP (p<0.001)

CONCLUSION

- ❖ IPP showed robust prediction of UDS-proven BOO and unsuccessful TWOC
- ❖ IPP facilitates the discriminatory use of invasive UDS, which should be reserved for symptomatic patients with equivocal IPP (Clinical BPH)
- ❖ This SR/MA summaries the evidence supporting IPP as an adjunct clinical parameter that should be considered for a larger role in clinical practice

References

Singapore General Hospital Department of Urology Cancer Registry Database