Appendix III

Author, Year Sample size	Key Inclusion Criteria	Diagnostic test Reference standard	Results: Diagnostic accuracy for identifying HS disease and/or association of test result with HS disease (defined as
Study Design			≥pT2, unless otherwise indicated) (95% CI, unless otherwise indicated)
RoB Almas, ⁴⁹ 2021	UTUC with RNU	Test: CT (n=176)	CT for predicting NOCD (≥ pT3 and/or N+)[n=176]
N=176 (CT); N=60	010C WILLI KNO	rest. C1 (II=176)	Local invasion on CT:
cytology)		Test: Urinary cytology (n=60;	Sensitivity: 49%
Retrospective [chart ⁻ eview]		43 with sample during ureteroscopy)	Specificity: 85% Pathological lymph nodes on CT:
cvicwj		инскеновору)	Sensitivity: 22%
High		Reference: Final surgical pathology results	Specificity: 98%
		patriology results	Urine cytology
			Presence of NOCD according to presence of malignant cell
Ng, ⁴⁷ 2011	UTUC with RNU	Test: CT (ipsilateral	on cytology: OR 1.84 (95% CI: 0.55 to 6.14), p=0.3 Sensitivity: 57% (39% to 74%)
Ng, 2011 N=106	0100 With Kito	hydronephrosis)	Specificity: 73% (61% to 83%)
Retrospective [chart			PPV: 51% (39% to 63%)
eview]		Reference: Final surgical pathology results	NPV: 78% (70% to 84%)
Moderate		patriology results	In multivariate adjusted analysis, hydronephrosis on CT wa
46.004.0	LITUOtd- DAUL	Took OT	associated with HS: HR 4.0 (1.4 to 11.5), p=0.01
//ammen,⁴6 2018 √8 (with 49	UTUC with RNU	Test: CT	Findings on CT
JTUCs)		Reference: Final surgical	Appearance: filling defect or mass vs. wall thickening or
Retrospective [chart eview]		pathology results	stricture Sensitivity: 87% (66% to 97%)
eview]			Specificity: 15% (4% to 35%)
Moderate			PPV: 48% (42% to 53%)
			NPV: 57% (25% to 84%)
			Margin: spiculated vs. smooth
			Sensitivity: 70% (47% to 87%) Specificity: 73% (52% to 88%)
			PPV: 70% (53% to 82%)
			NPV: 73% (58% to 84%)
			Collecting system: Dilated vs. non-dilated
			Sensitivity: 52% (31% to 73%)
			Specificity: 65% (44% to 83%) PPV: 57% (41% to 72%)
			NPV: 61% (48% to 72%)
			Texture: heterogeneous vs. homogeneous
			Sensitivity: 91% (72% to 99%)
			Specificity: 58% (37% to 77%) PPV: 66% (54% to 75%)
			NPV: 88% (66% to 97%)
			, ,
			Calcification vs. no calcification Sensitivity: 13% (3% to 34%)
			Specificity: 88% (70% to 98%)
			PPV: 50% (18% to 82%)
Scolieri, ⁴⁸ 2000	UTUC with RNU or	Test: CT	NPV: 54% (48% to 59%) For HS (≥pT3)
N=37	distal		` '
Retrospective [chart eview]	ureterectomy	Reference: Final surgical pathology results	Sensitivity: 28% (8% to 76%) Specificity: 100% (88% to 100%)
		panierogy round	PPV: 100% (NA)
Moderate			NPV: 85% (77% to 91%)
			CT failed to detect 34% (10/29) of tumors staged <pt3, td="" which<=""></pt3,>
			was treated as <t3 above="" ct="" for="" measures="" of<="" on="" td="" the=""></t3>
/u, ⁵⁰ 2021	UTUC with RNU	MDCTU	diagnostic accuracy For HS (≥pT3)
N= 125	with MDCTU		Sensitivity: 75% (59% to 87%)
Retrospective [chart			Specificity: 84% (74% to 91%)
eview]			PPV: 68% (56% to 78%) NPV: 88% (80% to 92%)
.ow			5570 (5570 15 5270)

	UTUC with NU	Test: Endoluminal US	Sensitivity: 17% (0.4% to 64%)
Farnum, ¹⁶² 2018 N=27	3.00		Specificity: 76% (53% to 92%)
Retrospective [chart		Reference: Final surgical pathology results	PPV: 17% (3% to 58%) NPV: 76% (68% to 83%)
review]		pathology results	NFV. 76% (66% to 65%)
Moderate 163 2044	LITUO W EV	Total Haling	Bladdonadadadada
Messer, ¹⁶³ 2011 N=326	UTUC with RNU or distal	Test: Urine cytology – voided/cath bladder and	Bladder and selective upper tract urine cytology combined (n=326):
Retrospective [chart	ureterectomy	selective upper tract	Sensitivity: 77% (70% to 84%)
review]		Reference: Final surgical	Specificity: 18% (13% to 24%) PPV: 45% (43% to 48%)
Moderate		pathology results	NPV: 47% (37% to 58%)
			Selective upper tract urine cytology (n=168):
			Sensitivity: 76% (71% to 84%)
Sakano, ¹⁶⁴ 2015	UTUC with RNU	Test: Urine cytology – voided	PPV: 89% (41% to 51%) For HS (≥pT3)
N=437	0100 WILLI KINO	bladder and selective upper	Multivariate adjusted analyses
Retrospective [chart review]		tract	Voided urine cytology: OR 1.86 (1.07 to 3.25), p=0.029
reviewj		Reference: Final surgical	voided unite cytology. OR 1.86 (1.07 to 3.25), p-0.029
High		pathology results	Selective upper tract urine cytology: univariate analysis
			p>0.05 (p=0.11); therefore, multivariate analysis not conducted.
Sverrisson, ¹⁶⁵ 2014	UTUC with RNU	Test: Urine cytology –	Sensitivity: 73% (52% to 88%)
N=68 Retrospective [chart		selective upper tract	Specificity: 32% (18% to 49%) PPV: 42% (35% to 50%)
review]		Reference: Final surgical	NPV: 63% (44% to 79%)
Moderate		pathology results	
Su, ⁴⁴ 2017	UTUC with	Test: FISH	Sensitivity: 72% (62% to 80%)
N=210 Retrospective [chart	surgical intervention	Reference: Final surgical	Specificity: 47% (37% to 57%) PPV: 58% (49% to 67%)
review]		pathology results	NPV: 62% (53% to 70%)
Moderate			
Wang, ⁴⁵ 2012	UTUC with RNU or	Test: FISH	Sensitivity: 83% (59% to 96%)
N=34 Diagnostic accuracy	ureterectomy	Reference: Final surgical	Specificity: 38% (15% to 65%) PPV: 60% (49% to 70%)
		pathology results	NPV: 67% (37% to 87%)
Moderate			FISH results were not significantly associated with HS (chi-
40			squared test p=0.12)
Almas, ⁴⁹ 2021	UTUC with RNU	Test: CT (n=176)	CT for predicting NOCD (≥ pT3 and/or N+)[n=176]
N=1/6 (CT): N=60			Local invasion on CT:
N=176 (CT); N=60 (cytology)		Test: Urinary cytology (n=60; 43	Local invasion on CT: Sensitivity: 49%
(cytology) Retrospective [chart		with sample during	Sensitivity: 49% Specificity: 85%
(cytology) Retrospective [chart review]		with sample during ureteroscopy)	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22%
(cytology) Retrospective [chart		with sample during ureteroscopy) Reference: Final surgical	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT:
(cytology) Retrospective [chart review]		with sample during ureteroscopy)	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22% Specificity: 98% Urine cytology
(cytology) Retrospective [chart review]		with sample during ureteroscopy) Reference: Final surgical	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22% Specificity: 98% Urine cytology Presence of NOCD according to presence of malignant cells on
(cytology) Retrospective [chart review] High Mammen, 46 2018	UTUC with RNU	with sample during ureteroscopy) Reference: Final surgical	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22% Specificity: 98% Urine cytology
(cytology) Retrospective [chart review] High Mammen, 48 2018 N=48 (with 49	UTUC with RNU	with sample during ureteroscopy) Reference: Final surgical pathology results Test: CT	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22% Specificity: 98% Urine cytology Presence of NOCD according to presence of malignant cells on cytology: OR 1.84 (95% CI: 0.55 to 6.14), p=0.3 Findings on CT
(cytology) Retrospective [chart review] High Mammen, 46 2018 N=48 (with 49 UTUCs) Retrospective [chart	UTUC with RNU	with sample during ureteroscopy) Reference: Final surgical pathology results	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22% Specificity: 98% Urine cytology Presence of NOCD according to presence of malignant cells on cytology: OR 1.84 (95% CI: 0.55 to 6.14), p=0.3 Findings on CT Appearance: filling defect or mass vs. wall thickening or stricture Sensitivity: 87% (66% to 97%)
(cytology) Retrospective [chart review] High Mammen, 48 2018 N=48 (with 49 UTUCs)	UTUC with RNU	with sample during ureteroscopy) Reference: Final surgical pathology results Test: CT Reference: Final surgical	Sensitivity: 49% Specificity: 85% Pathological lymph nodes on CT: Sensitivity: 22% Specificity: 98% Urine cytology Presence of NOCD according to presence of malignant cells on cytology: OR 1.84 (95% CI: 0.55 to 6.14), p=0.3 Findings on CT Appearance: filling defect or mass vs. wall thickening or stricture Sensitivity: 87% (66% to 97%) Specificity: 15% (4% to 35%)
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N=37 distal ureterectomy
Retrospective [chart Reference: Final surgical Sensitivity: 28% (8% to 76%)
review] pathology results Specificity: 100% (88% to 100%)
PPV: 100% (NA)
Moderate NPV: 85% (77% to 91%)
CT failed to date at 240/ (40/20) of turnous stored on T2 which was
CT failed to detect 34% (10/29) of tumors staged <pt3, td="" was<="" which=""></pt3,>
treated as <t3 above="" ct="" diagnostic<="" for="" measures="" of="" on="" td="" the=""></t3>
accuracy
Yu, ⁵⁰ 2021 UTUC with RNU MDCTU For HS (≥pT3)
N= 125 with MDCTU Sensitivity: 75% (59% to 87%)
Retrospective [chart Specificity: 84% (74% to 91%)
review] PPV: 68% (56% to 78%)
NPV: 88% (80% to 92%)
Low Control of the Co