

Supplemental Data

Supplemental Table 1 Baseline Characteristics of Patients With Sarcomatoid Urothelial Carcinoma (SUC)	
N = 43	n (%)
Gender	
Male	31 (72)
Female	12 (28)
Race	
Non-Hispanic White	39 (91)
Hispanic White	2 (5)
African American	1 (2)
Asian	1 (2)
Median age (y, IQR)	70 (61-76)
ECOG at diagnosis	
ECOG 0 - 1	41 (95)
ECOG 2+	2 (5)
Hazard exposure	
Smoking	32 (74)
Pelvic RT Hx	3 (7)
Stage at diagnosis	
cT2	21 (49)
cT3/4	22 (51)
Nodal disease-NO-N3 (imaging)	8 (19)
Metastatic disease-M1	3 (7)
CIS+ (TURBT)	12 (28)
LVI+ (TURBT)	4 (9)
Other histologies (TURBT)	
Squamous	11 (25)
Glandular	2 (5)
Micropapillary	1 (2)
Plasmacytoid	1 (2)
Undifferentiated	1 (2)

Abbreviations: CIS = carcinoma in situ; cT = clinical tumor stage; ECOG = eastern cooperative oncology group; Hx = history; IQR = interquartile range; LVI = lymphovascular invasion; RT = radiotherapy; TURBT = transurethral resection of bladder tumor.

# Sarcomatoid Urothelial Carcinoma Is Associated With Limited Response

**Supplemental Table 2** NAC Information for Each Patient

Patient ID	T stage	N stage	Regimen	Number of cycles
1	T4	N0	Gem/Cis	4
2	T2	N0	1 cycle of ddMVAC then discontinued due to renal and hematologic toxicity, the Gem/Cis for 2nd cycle but Gem was held on cycle 2 day 15; Gem only for cycle 3	3
3	T2	N0	Gem/Cis	4
4	T3	N1	ddMVAC	2
5	T4	N2	Gem/Cis	4
6	T3	N0	Gem/Cis	
7	T3	2	Gem/Cis	4
8	T3	N0	ddMVAC	3
9	T2	N1	Gem/Cis	3
10	T3	N0	Gem/Cis	NA
11	T2	N1	Gem/Cis	4
12	T3	N0	Gem/Cis	4
13	T3	N0	ddMVAC	4
14	T3	N0	ddMVAC	4
15	T2	N2	Gem/Cis	5
16	T2	N0	ddMVAC	3
17	T3	N0	Gem alone	4

Abbreviations: ddMVAC = dose-dense methotrexate, vinblastine, doxorubicin, and cisplatin; Gem = Gemcitabine; NA = Not applicable.

**Supplemental Table 3** Multivariate Cox Regression Analysis for Factors Associated With OS in the SEER Cohort, for Patients With Sarcomatoid Histology, Treated With Radical Cystectomy

Variables	N = 83 N (%)	Multivariate cox HR (95% CI)	P-Value
<b>Age category</b>			
66-70	21	REF	
71-75	30	0.99 (0.45-2.15)	.97
76-80	19	1.52 (0.64-3.60)	.34
81+	13	2.76 (1.08-7.05)	.03
<b>Race</b>			
White	76 (92)	REF	
African American	4 (5)	2.29 (0.57-9.24)	.25
Asian/Pacific Islander	3 (3)	1.27 (0.16-10.23)	.83
<b>T stage</b>			
T2	39 (47)	REF	
T3	31 (37)	2.67 (1.37-5.19)	.004
T4	13 (16)	4.13 (1.83-9.28)	.001
<b>N stage</b>			
N0	65 (78)	REF	
N1	18 (22)	1.34 (0.67-2.69)	.41
<b>NAC</b>			
No NAC	60 (72)	REF	
Non-SOC NAC	9 (11)	0.87 (0.40-1.94)	.74
SOC NAC	14 (17)	0.89 (0.33-2.40)	.82

Abbreviations: CI = confidence interval, HR = hazard ratio, NAC = neoadjuvant chemotherapy, SOC = standard of care.

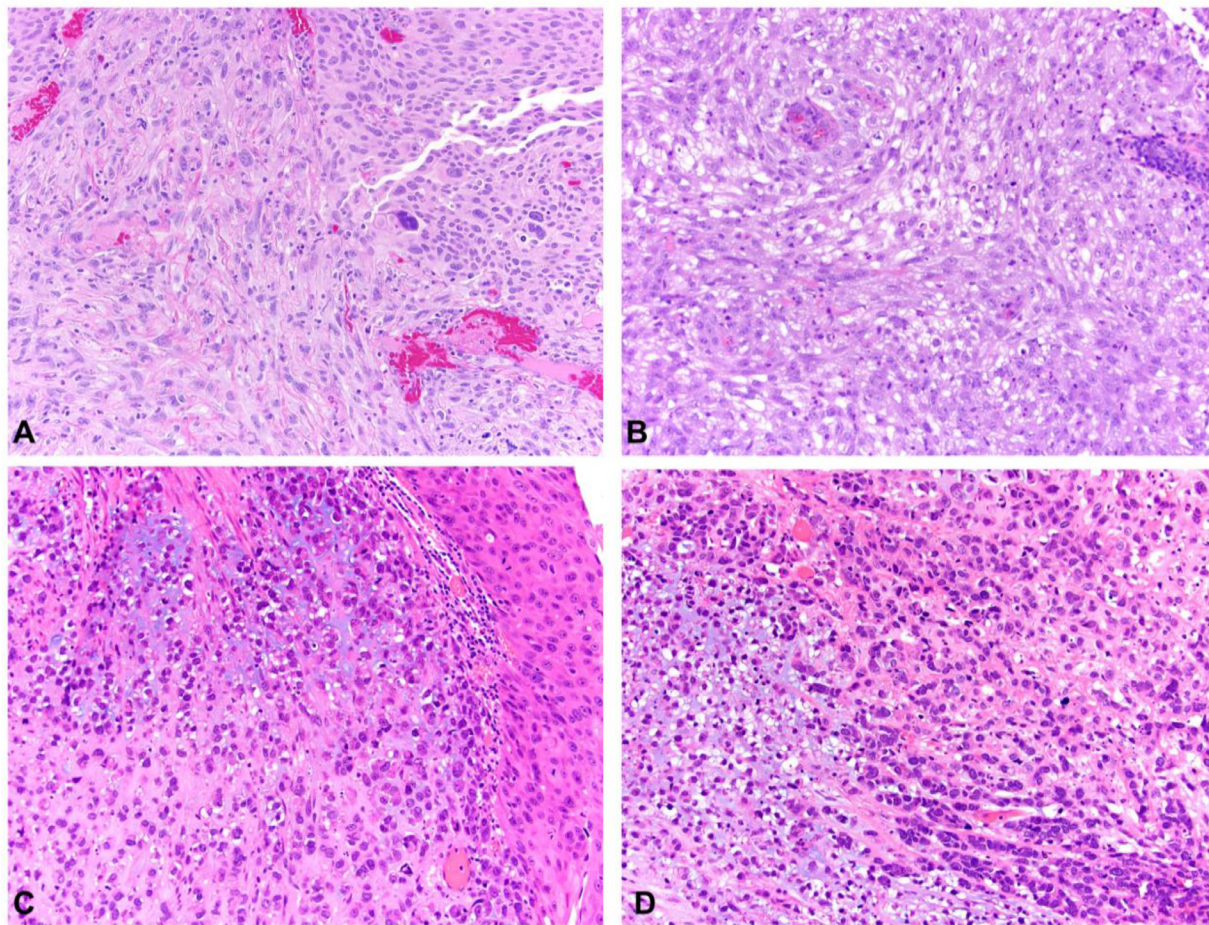
**Supplemental Table 4** Comparison Table of Published Cohorts of Patients With SUC Treated With RC

Reference	N (RC)	<pT2	pT2	pT3/pT4	pN+	Median OS(m)	ypT0N0
Present cohort	38	6 (16)	7 (18)	25 (63)	10 (26)	19.7	1/17 (6)
Almassi et al. <sup>13</sup>	131	8 (6.1)	39 (30)	84 (64)	26 (21)	NA	5/38 (13)
Fatima et al. <sup>9</sup>	25	0 (0)	3 (12)	20 (88)	12 (48)	NA	0/2 (0)
Sanfrancesco et al. <sup>8</sup>	22	0 (0)	6 (27)	16 (73)	7 (32)	9.7	N/A
Robinson et al. <sup>17</sup>	12	1 (8)	6 (50)	5 (42)	1 (8)	102	N/A
Wang et al. <sup>19</sup>	8	2 (25)	3 (38)	3 (38)	2 (25)	NA	N/A
Sabate-Arroyo et al. <sup>18</sup>	8	N/A	N/A	N/A	N/A	4.5-6.5 <sup>a</sup>	N/A
Baseskioglu et al. <sup>3</sup>	4	0 (0)	1 (25)	3 (75)	3 (75)	6.7	0

Abbreviations: N/A = not available (data not reported in the respective articles); OS = overall survival from diagnosis; pN = pathologic nodal stage; pT = pathologic tumor stage; RC = radical cystectomy; SUC = sarcomatoid urothelial carcinoma; ypT0N0 = pathologic complete response to neoadjuvant chemotherapy.

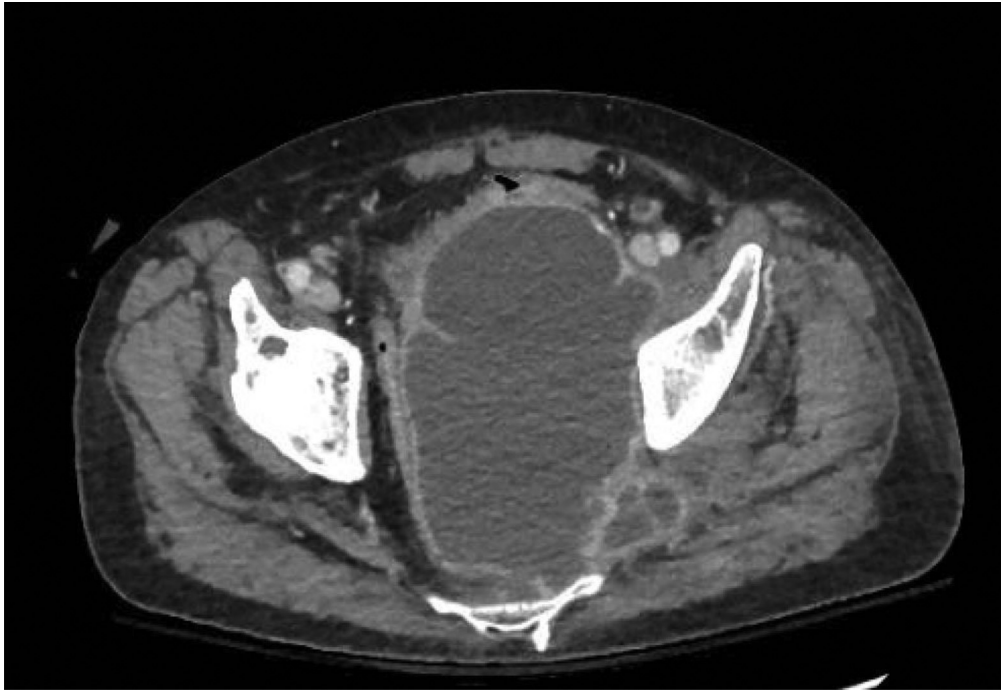
<sup>a</sup> 4.5 was for RC alone, 6.5 for patients who received adjuvant chemotherapy

**Supplemental Figure 1** Photomicrography of tumors with sarcomatoid components. A/B – Spindle cell morphology, characteristic of sarcomatous differentiation. C/D – Chondrosarcomatous mesenchymal component.



## Sarcomatoid Urothelial Carcinoma Is Associated With Limited Response

**Supplemental Figure 2A** Representative axial computed topography image of a 60-year-old man with sarcomatoid bladder cancer who developed a large pelvic cystic mass 2.6 months after radical cystectomy, later determined to represent cancer recurrence on pathology.



**Supplemental Figure 2B** Representative coronal computed topography image of a 50-year-old woman with sarcomatoid bladder cancer who developed a rapidly enlarging pelvic cystic mass 10.6 months after cystectomy, determined to be cancer recurrence on pathology.

