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Research Article

Sarcomatoid Carcinoma of the Prostate

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Keywords

• Sarcomatoid; Prostate; Carcinosarcoma

Abstract

Background: Sarcomatoid carcinoma of the prostate (SCP) is a rare and aggressive subtype of prostate cancer. Current data on clinical features, appropriate management and long-term outcomes of SCP are limited.

Methods: A systematic review of the literature was performed to identify published reports on SCP using keywords "sarcomatoid," "prostate," and "carcinosarcoma." No randomized trials were identified. Four single-center case series and one registry-based study were included in the final analysis.

Results: In total, 199 patients were included in the review (54 from the SEER registry, 145 from the four case series). SCP occurs more frequently in the late sixth to seventh decade of life (age range: 28-91 years). Many patients with SCP (48%-78%) have a history of prostate adenocarcinoma, with variable time to SPC onset (0.5-20 years). Most tumors are high grade, with locally advanced disease or metastasis. Urinary obstruction was the most common symptom (50%-92%). Advanced stage was associated with poor prognosis in all reports. Although prostatectomy as part of multimodality treatment likely affected cancer-specific survival in select patients, large variation was observed in prostatectomy and adjuvant therapy rates. No effective systemic chemotherapy was reported.

Conclusions: SCP is an aggressive variant of prostate adenocarcinoma. Molecular studies are needed to illuminate their aggressive underlying biology and develop individualized therapeutic approaches. The results of this analysis may help increase awareness of this rare malignancy and serve as a baseline for future clinical studies.

INTRODUCTION

Sarcomatoid carcinoma of the prostate (SCP) is a rare and aggressive subtype of prostate cancer representing <1% of all prostate cancers. These tumors are characterized histologically by a malignant epithelial component with a distinct population of sarcomatoid or mesenchymal appearing cells; however the histiogenesis of SCP is not well understood [1]. A history of prior prostatic adenocarcinoma is present in over 50% of these patients. There is no known screening method for SCP as traditional PSA screening has no role in this tumor. Due to the rarity of this tumor, no guidelines on the appropriate treatment are currently available. Patients diagnosed with this tumor uniformly have a dismal prognosis.

The goal of this study was to determine three basic characteristics of this disease: natural history of the disease, treatment modalities used, and the overall survival of patients diagnosed with sarcomatoid carcinoma of the prostate.

METHODS

A systematic review of the literature was performed in attempt to identify any and all published reports on SCP. The keywords "sarcomatoid," "prostate," and "carcinosarcoma" were used. Single case reports and reports not published in English were excluded. Articles published in high impact journals were reviewed thoroughly and selected to contribute to the information summarized in this article.

RESULTS

No randomized trials were identified. The literature review identified four single-center case series along with one registry-based study to be included in the final analysis. In total, 199 patients were included in the final review: 54 from the SEER registry and 145 from the four case series. Demographic data and clinical features of the patients are listed in Table 1. SCP occurs more frequently in the late sixth to seventh decade of life (age range: 28-91 years). Many patients with SCP (48-78%) have a history of prostate adenocarcinoma. The time to SPC onset ranges from 0.5-20 years with a mean of 5.2 years. In the studies where data was available, 76-100% of them are high grade with locally advanced disease or distant metastasis in 8% - 62%. Urinary obstruction was the most common symptom presenting in 50-92% of cases.

Treatment and outcomes of the patients are shown in Table 2. Advanced stage was associated with poor prognosis in all reports. Although prostatectomy as part of multimodality treatment likely affected cancer-specific survival in select patients, large variation was observed in prostatectomy and adjuvant therapy rates. No effective systemic chemotherapy was reported.

Table 1: Demographic and Clinical features of Patients from 5 Published Reports.

Variable	Hansel et al	Markowski	Wang et al	Dundore et al	Shannon et al
Patients	42	70	54	21	12
Urinary Obstruction (%)	50	NR	NR	86	92
Median or mean age (years)	70 (47-91)	70.8 (49-88)	74 (28-94)	68 (50-89)	70.7 (58-85)
White (%)	NR	NR	85.8	NR	NR
Black (%)	NR	NR	9.3	NR	NR
Prior HT/RT* (%)	90			38	
Tumor size (cm)	NR	NR	NR	NR	NR
High grade (%)	76		100‡	95	92
Local/regional disease**	19	30	38.9		0
Distant disease	57	8	24.1	62	83
Unknown stage	24	61	37	0	17
Node Positive (%)	7	NR		19	17
Prior adenocarcinoma (%)	66	78	NR	48	75
Time between original diagnosis* and sarcoma years range	6.8 (6mo-16 yr)	8.3 (9 mo-20yr)		2.75 (2-73 mo)	35.9 (2-89 mo)
Concurrent adenocarcinoma	98	79	NR	100	100
PSA above normal (%)	NR	NR	22.2	5	NR
Numerical data in parentheses are ranges					

Table 2: Treat and outcomes of Sarcomatoid Prostate Cancer.

Variable	Hansel et al	Markowski	Wang et al	Dundore et al	Shannon et al
NCHT (%)	NR	NR	NR	NR	22
NRT (%)	38*	2	20	33	66
CDS‡ (%)	47	8	70	100	33
ADJCHT (%)	21	16	NR	10	33
ADJRT (%)	10	4	13	5	75
Hormone therapy/surgical oophorectomy (%)	7	6	NR	48	25
No treatment data (%)		21	0	0	NR
CSS at 1 year (%)	80	NR	55	NR	NR
CSS at 3 years (%)	NR	NR	33	NR	NR
CSS at 5 years (%)	NR	NR	21	41	0
Median survival (mo)	NR	10.6	13	12	12 (5-48)
Follow-up duration, mean or median (mo)	27	106	(0-127)	10 (1-107)	NR

Numerical data in parentheses are ranges
Abbreviations: ADJCT: Adjuvant Chemotherapy; ADJRT: Adjuvant Radiation Therapy; CDS: Cancer Directed Surgery; CSS: Cancer-specific Survival; NCHT: Neoadjuvant Chemotherapy; NR: Not Repeated; NRT: Neoadjuvant Radiation Therapy; OS: Overall Survival; ‡Radical Prostatectomy or TURP, +Cancer Specific Survival % at 5 Years

DISCUSSION

The goal of our review was to determine three basic characteristics of this disease: natural history of disease, treatment modalities used, and the overall survival of patients diagnosed with SCP. While the studies examined were not uniform in the reporting of stage at diagnosis, treatment utilized, or outcomes subdivided on those characteristics, our review of the literature yielded much important information.

In studies where prior prostate adenocarcinoma was reported, 100 of 145 (68.9%) had a history of previously diagnosed adenocarcinoma. Prior treatment with hormone therapy (HT) or radiation therapy (RT) was not well documented, but did not correlate with disease progression or patient survival in one study reporting previous HT/RT in 90% of cases [2]. The mean time between the original diagnosis of prostatic adenocarcinoma and SCP was 5.2 years. Such a strong association with prior adenocarcinoma raises the question if adenocarcinoma is transforming into a much more aggressive subtype. Alternatively, perhaps in response to standard therapy of adenocarcinoma, a small subset of sarcomatoid cells may be present initially that are resistant to standard therapy. Across all case studies, there were very few reports of patients presenting with increased PSA. Thus standard methods of prostate screening and surveillance are not effective for SCP.

As SCP is an exceedingly rare cancer, no standard treatment regimen has been defined. In the registry-based study analyzed, radical prostatectomy was the only treatment modality found to significantly improve survival when compared to non-prostatectomy treatment [3]. Cancer specific survival at 1, 3, and

5 years was 42.1%, 17.0%, and 12.8% respectively versus 92.3%, 75.5%, and 43.2% in the non-prostatectomy vs prostatectomy groups respectively. Of the patients with known tumor stage in this population, 35 of 36 had stage T ≥ 3.

In a case series of 70 patients from the Johns Hopkins Hospital, long term follow up data was available for 45 patients [4]. The median overall survival (OS) was not reached after 106 months in the local disease group. Overall survival in local disease group with bladder involvement and metastatic disease were 9 and 7.1 months respectively [4]. Regarding systemic treatment utilized in this cohort, HT was used in a small subset of patients in which no response was observed; chemotherapy regimens used included traditional prostate cancer treatment (docetaxel) and small cell carcinoma treatment (carboplatin and etoposide) were used. OS was uniformly poor and similar in both groups suggesting a lack of an effective systemic therapy [4-6].

CONCLUSION

In summary, SCP is a rare and aggressive tumor. It typically presents in the sixth to seventh decade of life and most often after a previous diagnosis of prostatic adenocarcinoma. To date there are no known screening methods with the majority or patients presenting with clinical symptoms, five to six years after diagnosis of primary carcinoma. Currently there is no standardized treatment regimen for SCP. Limited evidence does show good outcomes for patients presenting with localized disease treated with radical prostatectomy. However, most patients present with advanced disease in which case the prognosis is extremely poor. Systemic chemotherapy has shown to be ineffective to this point. The results of this review should help to increase awareness of this rare malignancy. Early diagnosis and prompt intervention may be the only hope of good outcomes in these patients until more effective systemic therapy is available. Clinical trials evaluating novel therapies based on molecular profiling of SCP are needed to evaluate therapeutic options in patients who are not surgical candidates.

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