

CASE REPORTS

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# Sarcomatoid carcinoma of the prostate presenting as bilateral cervical lymphadenopathy: a rare case report

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## Abstract

**Background:** Sarcomatoid carcinoma (also called carcinosarcoma in the latest WHO classification 2016) of the prostate gland is a biphasic malignant neoplasm which exhibits epithelial and mesenchymal differentiation [1]. Sarcomatoid carcinoma is a rare tumour, considered as a variant of acinar adenocarcinoma in the WHO classification, with less than 200 reported cases in the literature to date [2]. Sarcomatoid carcinoma of prostate presenting with bilateral cervical lymph node deposits as the first clinical manifestation, is even rarer, and reported cases were not found in the literature; hence, this is the first case report of such, to the best of our knowledge.

**Case presentation:** We report a case of sarcomatoid carcinoma of the prostate in a 72-year-old Sri Lankan man who presented with bilateral cervical lymphadenopathy. He had hard nodular prostate on digital rectal examination (DRE). Ultrasound scan of abdomen (USS) revealed the presence of paraaortic lymphadenopathy, in addition. The excision biopsy of the right cervical lymph node revealed deposit of a carcinoma of epithelioid histomorphology, which showed patchy strong positivity for immunohistochemical marker (IHCm), PSA. His serum PSA value was 48 ng/ml (reference < 5.40 ng/ml). Contrast-enhanced computed tomography (CECT) showed mildly enlarged prostate gland with irregular outline, sclerotic lesions in cervico-thoracic and lumbosacral vertebrae and generalized lymphadenopathy. Transrectal ultrasound guided biopsy of the prostate revealed sarcomatoid carcinoma. Disseminated sarcomatoid carcinoma of prostate was diagnosed. The patient has undergone bilateral orchidectomy, marking a serum PSA value of 5.4 ng/ml two months thereafter. He is surviving for six months after diagnosis and is currently under chemotherapy with docetaxel for the disseminated disease.

**Conclusion:** Sarcomatoid carcinoma can present with cervical lymphadenopathy with absent lower urinary tract symptoms. In elderly patients with cervical lymphadenopathy, serum PSA, DRE and trans-rectal ultrasound scan are advocated to rule out prostate cancer. Immunohistochemical markers are required for the diagnosis of primary tumour and secondary deposit of sarcomatoid carcinoma of prostate.

**Keywords:** Sarcomatoid carcinoma, Carcinosarcoma, Biphasic, Rare tumour, Acinar adenocarcinoma, Prostate gland, Cervical lymphadenopathy

## 1 Background

The commonest tumour in the prostate gland is acinar adenocarcinoma; however, sarcomatoid carcinoma, considered as a variant of acinar adenocarcinoma [1], is rare. Some sarcomatoid carcinomas exhibit an intimate mixture of a sarcomatoid component and typical acinar adenocarcinoma of the prostate but some are monophasic [2]. Molecular studies have demonstrated that both

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sarcomatoid and carcinomatous elements are of the same clonal origin [1].

Approximately half of the patients provides a history of acinar adenocarcinoma treated with radiation and/or hormone therapy and subsequent development of sarcomatoid carcinoma [2]. Usually the patients present with bladder outflow tract obstruction symptoms [3] with this aggressive tumour, but presenting with bilateral cervical lymphadenopathy is not reported to date. LUTS attribute to the early presentation of the patient to medical attention, and in turn, absence of such symptoms predisposes the patient to late presentation with resultant disseminated disease which has a dismal outcome.

The prognosis associated with sarcomatoid carcinoma is usually poor [1].

We report a case of a 72-year-old man with prostatic sarcomatoid carcinoma presented with bilateral cervical lymphadenopathy and discuss the clinical, diagnostic work up with special attention to histopathology and prognostic aspects of this uncommon tumour.

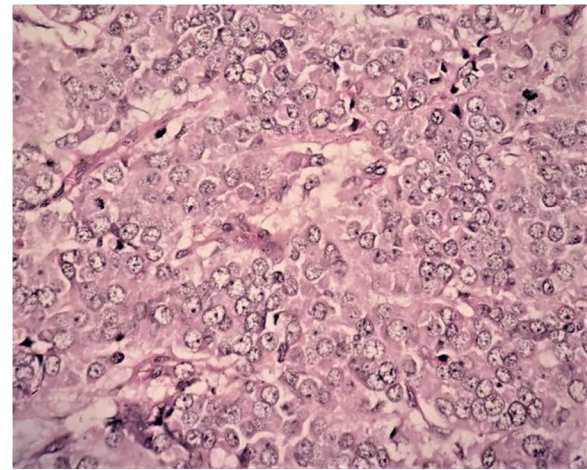
## 2 Case presentation

A 72-year-old man presented to the surgical clinic with bilateral cervical lymphadenopathy and malaise for a few weeks. He denied LUTS, low back pain, neurological symptoms of lower extremities such as paraesthesia and numbness.

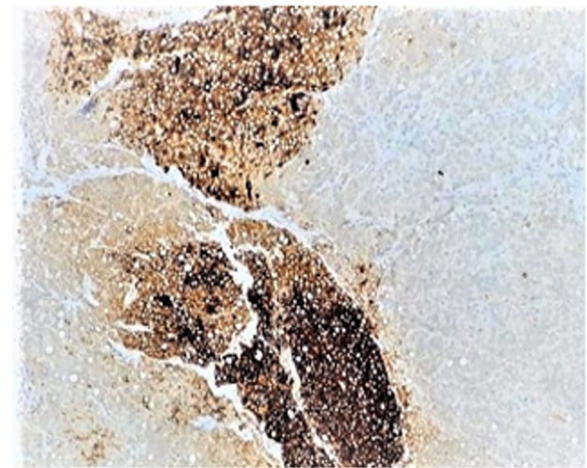
On examination, he had bilateral cervical lymphadenopathy and hard nodular prostate on DRE. Rest of the physical examination was unremarkable.

USS of neck and abdomen revealed bilateral cervical and paraaortic lymphadenopathy. Submandibular, parotid and thyroid glands were normal. The haematological investigations did not show features suggestive of haematological malignancy. The excision biopsy of the right cervical lymph node, which measured 26 mm in maximum dimension, was performed and microscopy revealed complete effacement of the lymph node architecture by an infiltrate of cohesive nests of atypical epithelial cells containing pale granular amphophilic cytoplasm and vesicular nuclei with prominent nucleoli. Some cells showed vacuolated cytoplasm. Mitotic figures were not prominent. (Fig. 1) IHCm PSA showed strong patchy positive staining of the tumour cells. (Fig. 2) TTF 1 and CK 7 showed negative results.

Guided by this lymph node biopsy diagnosis, serum PSA was performed and it was 48 ng/ml (reference <5.40 ng/ml). Upper gastrointestinal endoscopy did not detect abnormality of significance. CECT showed bilateral lower cervical lymph nodes ranging from 15 to 40 mm in size, paratracheal, pretracheal and anterior mediastinal lymphadenopathy, bilateral axillary lymphadenopathy, paraaortic and pelvic lymph adenopathy,

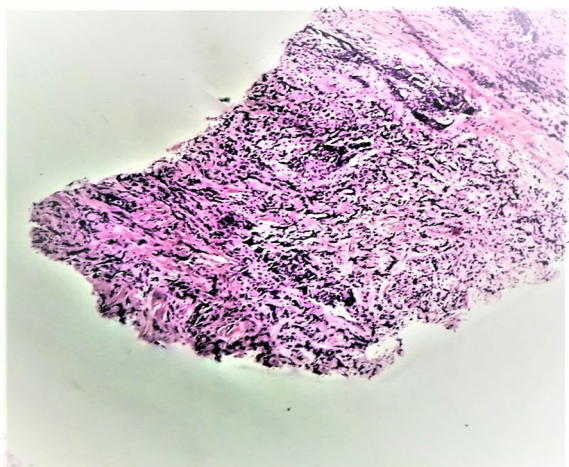


**Fig. 1** Microscopic appearance of the deposit of the adenocarcinoma in excision biopsy of the cervical lymph node (H&E)

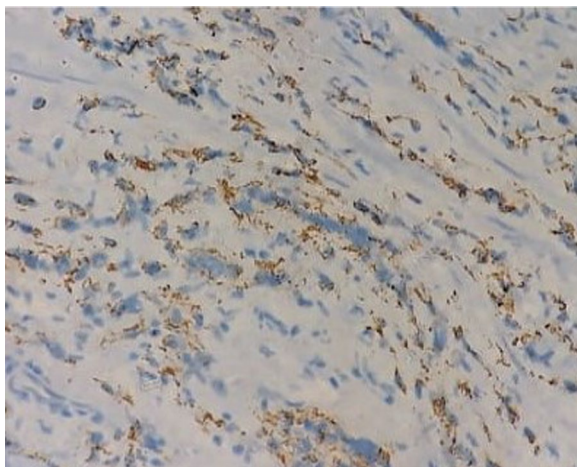


**Fig. 2** Immunohistochemical marker PSA shows patchy strong positive staining of the tumour cells

mildly enlarged prostate gland with irregular outline and patchy mixed sclerotic lesions in cervico-thoracic and lumbosacral vertebrae. Transrectal ultrasound guided biopsy of the prostate was performed to confirm the primary site of the metastasizing tumour. Microscopy of the prostatic core biopsy showed sarcomatoid carcinoma of prostate with predominantly spindle cells, infiltrating in strands-like architecture. The constituent cells showed hyperchromatic elongated nuclei with minimum cytoplasm. Heterologous sarcomatoid elements were not present. Occasional poorly formed acinar structures, of Gleason grade  $5+5=10$  and grade group 5, were present amidst the spindle-shaped cells (Fig. 3). Both spindle



**Fig. 3** Microscopic appearance of the core biopsy of the prostate sarcomatoid carcinoma (H&E)



**Fig. 4** Immunohistochemical marker AE1/AE3 shows positive staining of the tumour cells

shaped and epithelioid cells were positive for AE1/AE3 (Fig. 4) and negative for PSA. IHCm NKX 3.1 was not available in the local setting. Tissue was inadequate to perform other IHCm such as Vimentin, Desmin, SMA and S100. Clinical, serological, histological and immunophenotypical evidence confirmed the presence of a primary sarcomatoid carcinoma of the prostate gland metastasizing to bilateral cervical lymph nodes and bone.

The available investigation findings staged the tumour to T2(at least) N1 M1b of prostate (AJCC 8th edition) [4], stage group IV and prognostic group IV [1].

According to the multi-disciplinary team meeting decision, the patient was offered androgen deprivation

therapy. Pros and cons of each modality, medical and surgical castration, was explained to the patient and he consented for surgical castration by bilateral orchidectomy. Neither prostatectomy nor regional lymphadenectomy were performed for the disseminated disease. Two months after bilateral orchidectomy his serum PSA value was 5.4 ng/ml after which, he was offered six cycles of chemotherapy with docetaxel for the disseminated disease. He has completed three out of six cycles of docetaxel and is surviving for six months, to date, after diagnosis. He will be followed up with serum PSA after completion of chemotherapy.

### 3 Discussion

Sarcomatoid carcinoma is a biphasic tumour which is clinically aggressive, presenting with high stage and which has poor prognosis [2].

Patients with sarcomatoid carcinoma tend to be older men, with a mean age of 68 years and a range of 32–91 years [1].

More than half of the patients gives a history of prior acinar prostatic adenocarcinoma and usually 9–22 years after initial diagnosis, the tumour evolves to sarcomatoid carcinoma [2] and most of the patients provide a history of prior treatment by androgen deprivation and/or radiotherapy [1–3]. A case report giving a much shorter interval of, 08 months, evolving from acinar adenocarcinoma to sarcomatoid carcinoma after treatment with androgen blockage therapy is being reported by Onur et al. [5] Transformation of the acinar adenocarcinoma is thought to represent dedifferentiation from usually high-grade acinar prostatic adenocarcinoma [2]. Reason for the sarcomatoid transformation of this patient cannot be determined as he did not have such a therapeutic history.

The commonest presenting complaint of prostatic adenocarcinoma is LUTS [5]. Some other patients may present with low back pain, paraesthesia and numbness of lower extremities due to locally advanced disease or metastatic disease. Absence of such symptoms predisposes the patients to late presentation with disseminated disease. Lack of expression of usual symptoms of prostatic carcinoma has resulted in diagnostic delay in this patient.

Many patents with sarcomatoid variant are unable to raise serum PSA levels, which contradicts the norm of acinar adenocarcinoma [5], and which causes diagnostic delays. Contrary to that norm, this patient had a raised serum PSA value. Should it be owing to the widely disseminated disease or this patient being belonging to the minority who expresses high serum PSA value is not clear.

Sarcomatoid carcinoma grows locally and metastasizes at distal sites in a quite short period of time [5], showing



off its aggressive behaviour. Lymph node chains that are usually considered to be metastatic in prostate cancer are the common iliac, inguinal, femoral, aortic or other distant nodal chains [6]. Abdomino-pelvic together with supradiaphragmatic lymphadenopathy can present a diagnostic challenge, given the overlapping clinical and radiological differential diagnosis of lymphoma and other malignancies of numerous primary sites. Rare case reports of prostatic adenocarcinoma with cervical lymph node metastases as the first clinical manifestation of prostate cancer are found, in the setting of widely disseminated disease [7], but none of them were of sarcomatoid carcinoma. In turn, patchy positivity of the lymph node deposit for IHCm PSA made it more difficult, as usually deposits of prostate carcinoma show diffuse strong positive staining of the tumour cells. Several investigations including upper gastrointestinal endoscopy and chest X-ray were also performed, to reveal a primary site in the supradiaphragmatic region, as cervical lymphadenopathy was commoner in deposits of such primary locations. USS of thyroid gland was radiologically unremarkable. Krieken et al. have reported that salivary gland tumours in males have shown to be positive with IHCm PSA [8], but the USS did not reveal a salivary gland tumour either in this patient.

Osseous bone deposits on imaging studies are detected in over 65% of men with advanced prostate carcinoma [6]. The imaging studies of this patient also suggested similar findings which favoured primary prostatic tumour.

Microscopic appearance of the sarcomatoid carcinomas exhibits either biphasic pattern or monophasic pattern [2]. In biphasic tumours, the microscopic appearance of the prostate biopsy usually associates with a high Gleason grade of the carcinomatous component [2]. Similarly, the epithelial component, although a minute fraction of <1% of the entire core of tissue in this patient's prostate biopsy, was Gleason's grade 5. The sarcomatoid component was the predominant morphological pattern, which showed a nondescript spindle cell population, without heterologous elements. Immunohistochemistry profile of the prostate biopsy was different from that of a usual acinar adenocarcinoma. Staining with IHCm cytokeratin, AE1/AE3, associated with negative staining with the prostate-specific marker, PSA, was challenging in confirming primary prostatic carcinoma, especially with the limited tissue in core biopsy obtained only for the confirmation of the presence of primary prostatic adenocarcinoma. However, this pattern of staining for IHCm was observed in previous case reports [3] and this is an expected staining pattern of this tumour [2]. IHCm NKX 3.1, the expression of which is highly sensitive [1, 2], and specific for prostatic adenocarcinoma [1], which

would have been helpful in this situation for confirmation, was not available in the local setting. At this point, correlation with the serological and radiological findings was helpful in confirming the primary prostatic carcinoma. It was identified as sarcomatoid carcinoma, differentiating from other malignant spindle cell tumours of prostate, e.g. prostatic stromal sarcoma, prostatic leiomyosarcoma and prostatic solitary fibrous tumour, by the positive staining of these cells for cytokeratin stain. Therefore, and also because of limited availability of the tissue, other markers, which usually seem to be positive with the sarcomatoid component, e.g. Vimentin, Desmin, SMA and S100 [2], were not performed. Histomorphology of the cervical lymph node was suggestive of primary prostate cancer. It showed only the epithelial morphology and did not show a sarcomatoid component. This is the experience of most of the other documented metastatic sarcomatoid carcinomas of the prostate in the literature [2]. The patchy but strong staining of the tumour cells for IHCm PSA favoured deposit from prostate primary. This pattern of PSA staining is expected in the epithelial component of sarcomatoid carcinoma [2]. Molecular studies of ERG rearrangements detectable by FISH or sequencing in both sarcomatoid and carcinomatous components can be used to confirm sarcomatoid carcinoma as well as its origin in prostate gland [9], in cases in which the other modalities for diagnosis are equivocal. This is supported by another study which has revealed the presence of ERG fusions in this cancer [9, 10]. However, molecular studies were not needed in this patient as the clinical, radiological and serum investigations were in keeping with the primary prostate carcinoma.

Prognosis is often poor with a 5-year cancer-specific survival rate of 40% in organ confined disease [1]. However, in metastatic disease, like that of this patient, the predicted survival is 07 months [2]. A recent study suggests that local sarcomatoid prostate cancer can be effectively treated with definitive therapy leading to favourable outcomes [11], highlighting the importance of early detection.

#### 4 Conclusions

Sarcomatoid carcinoma can present with bilateral cervical lymphadenopathy with absent LUTS. In elderly patients with cervical lymphadenopathy, serum PSA, DRE and trans-rectal ultrasound scan are advocated to rule out prostate cancer.

Immunohistochemical markers are required for the diagnosis of primary tumour and secondary deposit of sarcomatoid carcinoma of prostate.

## Abbreviations

LUTS: Lower urinary tract symptoms; CECT: Contrast-enhanced computed tomography; DRE: Digital rectal examination; FISH: Fluorescence in-situ hybridization; IHCm: Immunohistochemical marker; PSA: Prostate specific antigen; USS: Ultrasound scan; WHO: World Health Organization.

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## Authors' contributions

Both authors have made substantial contributions to the management of this patient and writing up the case report. (The first author (corresponding author) has reported on the histopathology of the biopsies and the second author has taken the clinical history, clinically examined the patient, ordered the necessary investigations and done the surgical management of the patient.) Both have approved the submitted version (and any substantially modified version that involves the author's contribution to the study) and have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature. Both authors have read and approved the manuscript.

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## Availability of data and materials

Not applicable.

## Declarations

### Ethics approval and consent to participate

As I have submitted a case report with only the age and the ethnicity of the patient without any identity of the patient, the ethical approval is not required. Consent for participation is not relevant as this is a case report.

### Consent for publication

Written informed consent for publication of his clinical details and histopathological images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal.

### Competing interests

The authors declare that there is no conflict of interests regarding the publication of this case report.

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