Annals of Research in Oncology
Vol. 6(1), 53-58, 2026

CASE REPORT

SARCOMATOID CARCINOMA OF THE PROSTATE – RARE ENTITY WITH RARE PRESENTATION: A CASE REPORT

Preety **Negi** [1,*], Arun **Raja** [2], Vikrant **Mahajan** [3], Harnoor **Singh Pruthi** [4], Tejas **Kalyanpur** [5], Dimbeswar **Roy** [1]

[1] Department of Radiation Oncology, Capitol Hospital, Jalandhar, Punjab, India
[2] Department of Medical Oncology, Capitol Hospital, Jalandhar, Punjab, India
[3] Department of Urology, Capitol Hospital, Jalandhar, Punjab, India
[4] Department of Medicine, Capitol Hospital, Jalandhar, Punjab, India
[5] Department of Radiology, Capitol Hospital, Jalandhar, Punjab, India
* Correspondence to: drpreetinegi@gmail.com; https://orcid.org/0000-0001-5397-9206

ABSTRACT: Sarcomatoid carcinoma of the prostate is a rare entity constituting less than 0.1% of primary malignant tumors of the prostate. This malignancy is characterized by the presence of both glandular and sarcomatoid components, posing unique challenges in its diagnosis and management. We describe the case of a 66-year-old man who presented with a two-month history of left-sided chest pain and diffuse lower backache. Imaging revealed a mass lesion involving the prostate with widespread bone metastasis, and the serum prostate-specific antigen (PSA) level was 11.6 ng/ml. Subsequent immunohistochemical analysis confirmed sarcomatoid carcinoma of the prostate. The diagnosis and management of sarcomatoid carcinoma of the prostate are challenging due to its rarity, unusual presentation, and biphasic histologic nature. This aggressive malignancy carries a dismal prognosis and should be considered in the differential diagnosis of patients presenting with bone metastases and disproportionately low PSA levels.

Doi: 10.48286/aro.2026.120

Impact statement: This case highlights the importance of considering sarcomatoid carcinoma of the prostate in atypical presentations of metastatic prostate malignancy with disproportionately low PSA levels.

Key words: *Immunohistochemistry; prostatic neoplasms; prostate-specific antigen; prognosis; sarcomatoid.*

Received: Jan 07, 2026/**Accepted:** Feb 26, 2026

Published: Mar 31, 2026

INTRODUCTION

Sarcomatoid carcinoma of the prostate is an exceptionally rare malignancy, accounting for fewer than 0.1% of all prostate malignancies (1). This tumor consists of mixture of both carcinomatous and sarcomatoid components, highlighting the need for meticulous histopathological evaluation. The most recent edition of World Health Organization classification of tumors, sarcomatoid carcinoma of the prostate has been categorized as a subtype of acinar adenocarcinoma (2). To date, only a few hundred cases of sarcomatoid carcinoma of the prostate have been described in the literature worldwide. We present a case of sarcomatoid carcinoma of the prostate in a 66-year-old man, illustrating the diverse clinical presentation and challenges in diagnosis, and management.

CASE PRESENTATION

We present the case of a 66-year-old man who presented with complaints of left-sided chest pain, and diffuse pain in the lower back that has been radiating to the right thigh, associated with loss of appetite for the previous 2-3 months. His physical exam-

ination revealed mild tenderness in the chest wall on the left side, otherwise was unremarkable. He presented to an outside hospital where CT chest revealed a lesion involving the left 7th rib, and an MRI of the lumbo-sacral spine which suggested marrow infiltrative changes or metastatic disease involving D11, L2, and L3 vertebrae. A soft tissue lesion involving the right foraminal region abutting the right-sided exiting nerve roots was observed at the L2 vertebral level. A pelvic and abdominal ultrasound revealed grade II prostatomegaly and early liver parenchymal disease. These results highlighted the possibility of multiple myeloma or primary originating in the prostate and metastasizing to the bone. With a negative myeloma profile, the prostate-specific antigen (PSA) levels were slightly elevated (11.6 ng/ml). A subsequent fluorodeoxyglucose positron emission tomography (FDG-PET) scan for staging showed FDG avid heterogeneously enhancing large mass lesion involving both lobes of the prostate gland, primarily involving the right half of the prostate and associated with peri-prostatic infiltration. The FDG-avid prostatic mass lesion had loss of fat planes with bilateral seminal vesicles, and the posterior wall of the urinary bladder. Multiple sclerotic-lytic lesions were observed in the bodies of multiple vertebrae, the right scapula, the left clavicle, and the sacrum, as well as the shafts of multiple ribs on both sides, the largest of which involved the shaft of the seventh rib on the left side (SUV = 7.48 gm/ml) (**Figure 1**).

A biopsy from the rib lesion of our patient revealed deposits from the sarcomatoid lesion, possibly of prostatic origin. The most likely differential diagnosis was sarcoma originating from the prostate and double malignancy-carcinoma prostate and sarcoma arising from the bone. Histopathological examination of the rib lesion revealed plump, spindle-shaped cells with features of atypia in the form of nuclear

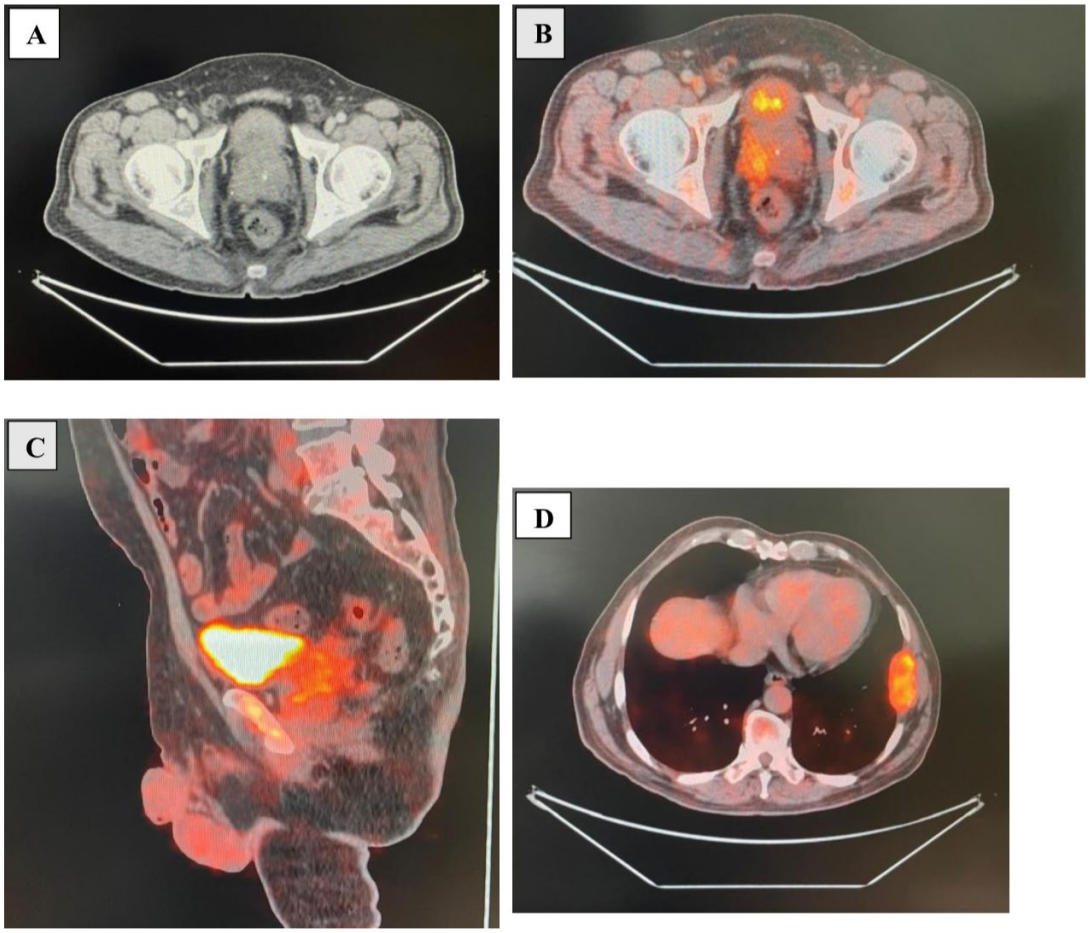

Figure 1. ***(A-D)*** *FDG avid heterogeneously enhancing large mass lesion involving both lobes of the prostate gland, predominantly involved the right half of the prostate associated with peri-prostatic infiltration with loss of fat planes with bilateral seminal vesicles and the posterior wall of the urinary bladder. FDG-avid multiple sclerotic-lytic lesions were seen involving the shafts of multiple ribs on both sides, the largest involving the shaft of the 7th rib on the left side (SUV = 7.48 gm/ml).*

pleomorphism and hyperchromatic cells arranged in fascicles. Additionally, focal areas of necrosis and haemorrhage were also noted. The diagnosis of spindle cell neoplasm with a potential for sarcomatoid carcinoma was confirmed by immunohistochemistry staining, which showed some areas to be positive for calponin, desmin, and smooth muscle actin (SMA) consistent with sarcomatous appearance. S-100, H-caldesmon, myogenin, CD117, EMA, and CD34 did not show any staining. Ki-67 proliferative activity was 18-20% (**Figure 2**).

A multiparametric MRI of the prostate revealed a heterogeneous mass with diffusion restriction and early enhancement measuring 3.2 × 3.3 × 5.8 cm that

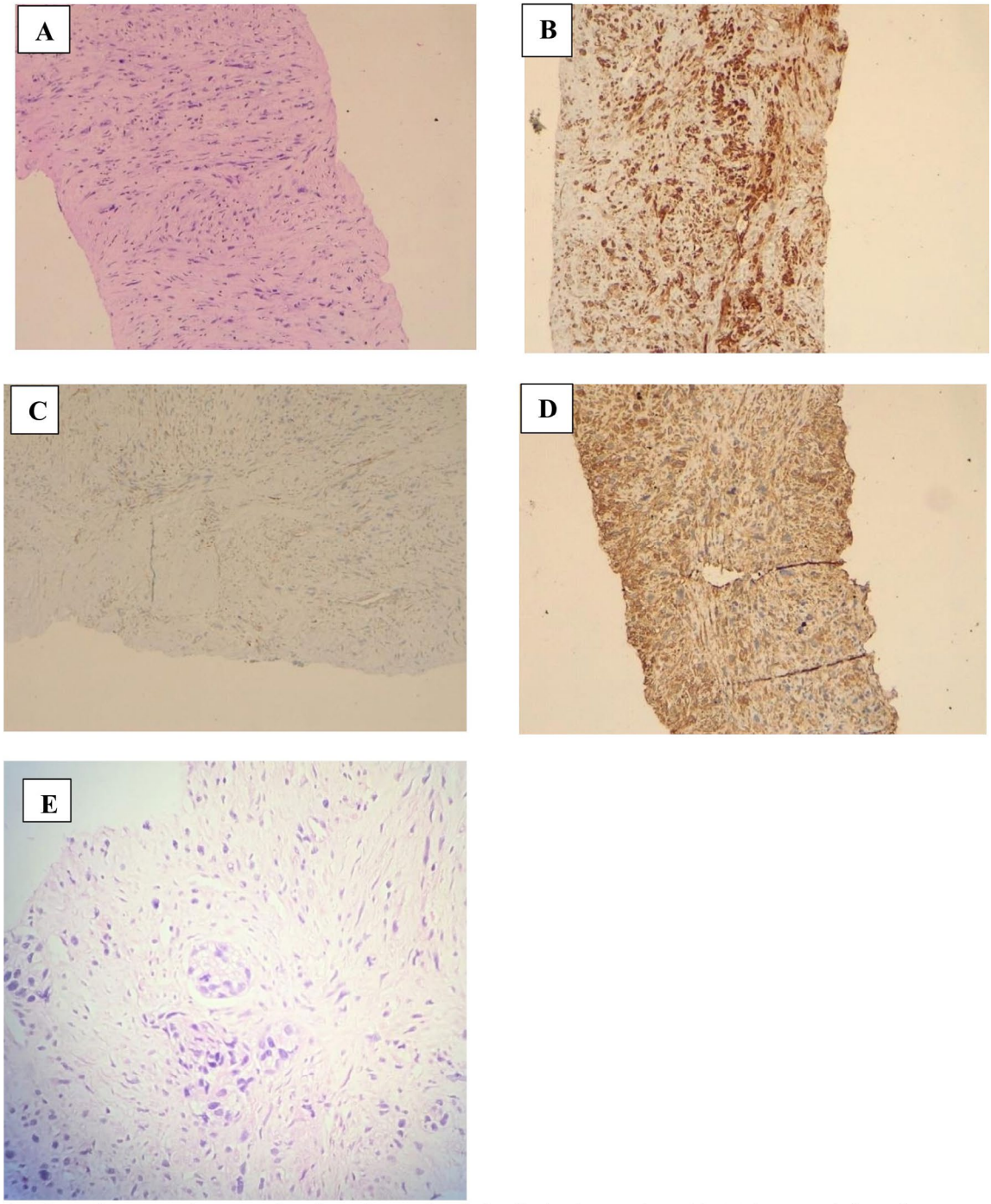

Figure 2. *Microscopic examination from the left rib lesion using **(A)** H&E staining demonstrating plump spindle-shaped cells with atypia in the form of nuclear pleomorphism and hyperchromatous in fascicles at a low power field 10x; **(B)** Immunohistochemical staining showing moderate and diffuse immunoreactivity for Calponin (IHC x400); **(C)** Strong and diffuse positive immunoreactivity for Desmin (IHC x400); **(D)** Strong and diffuse positive immunoreactivity for SMA (IHC x400); **(E)** Histopathological examination of the prostate revealed a biphasic malignant neoplasm composed of epithelial elements arranged in glandular structures with sarcomatous component characterized by plump spindle cells.*

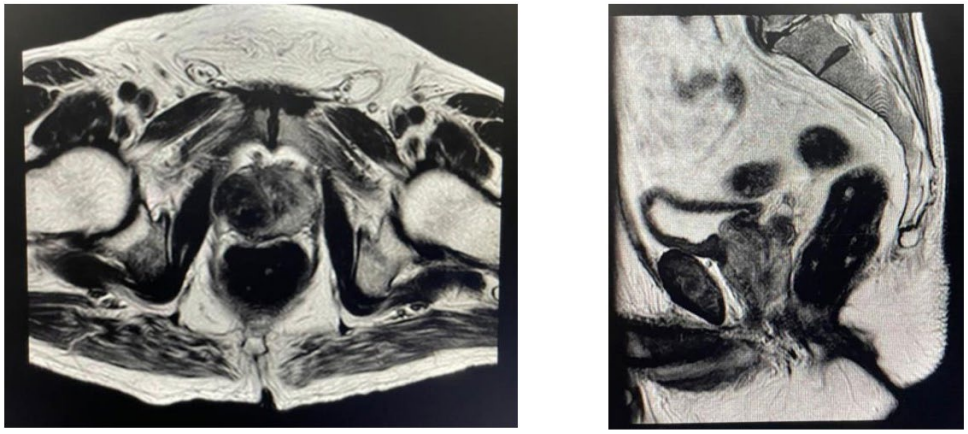

Figure 3. *Magnetic resonance imaging of the prostate revealing heterogeneous mass with diffusion restriction and early enhancement measuring 3.2 × 3.3 × 5.8 cm replacing the peripheral zone of the prostate, infiltrating the right neurovascular bundle, base, and right side of the seminal vesicle with the abutment of the right obturator internus muscle on the lateral side.*

replaced the peripheral zone of the prostate on the right side. Posteriorly, this mass infiltrated the right neurovascular bundle, base, and right side of the seminal vesicle with the abutment of the right obturator internus muscle on the lateral side (**Figure 3**). Subsequently the patient underwent prostate biopsy which revealed admixing of spindle cells and epithelial components, with the epithelial component constituting only approximately 10-15% of the prostatic tissue. No transition zone was identified between the two components. Mitotic activity was noted at 3-4 mitoses per high-power field. Areas of necrosis and perineural invasion were also present. Gleason score was 4 + 3 = 7. This favored the diagnosis of sarcomatoid carcinoma of prostate.

After a multidisciplinary team discussion, in view of advanced metastatic disease and severe left-sided chest pain, he was treated with palliative radiation therapy to the left rib lesion to a dose of 30 Gy in ten fractions using intensity-modulated radiation therapy. The patient experienced symptomatic improvement and was referred to medical oncology for systemic treatment.

DISCUSSION

Soft tissue sarcomas encompass a group of highly heterogeneous mesenchymal malignancies accounting for < 1% of all cancers. Sarcomatoid carcinoma of the prostate is a rare malignant biphasic tumor characterized by the coexistence of epithelial (carcinomatous) and mesenchymal (sarcomatous) components, with variable presence of heterologous elements (3). The exact origin of these tumors is controversial. It is hypothesized that these tumors arise from the independent development of sarcomatous and carcinomatous components within the prostate, resulting in a biphasic morphology. This tumor may arise de novo or develop through histologic transformation occurring several years after treatment for conventional prostatic adenocarcinoma (4).

The clinical presentation of sarcomatoid carcinoma of the prostate is heterogeneous, with patients presenting with lower urinary tract obstructive symptoms, including poor urinary stream, hesitancy, post-void dribbling, and a sensation of incomplete bladder emptying. In contrast, irritative symptoms such as urinary frequency, urgency, and dysuria are less frequently reported (5). Nevertheless, rare atypical presentations without urinary complaints have been described in the literature. Jayasinghe *et al*. have reported sarcomatoid carcinoma of the prostate presenting with bilateral cervical lymphadenopathy without accompanying lower urinary tract symptoms (6). Our patient demonstrated an unusual clinical presentation, with chest pain and diffuse lower back pain radiating to the right thigh, in the absence of urinary symptoms. The absence of typical symptoms of carcinoma prostate may have contributed to a delay in diagnosis in this patient.

The diagnosis of this tumor is complicated by several clinicopathologic and immunohistochemical challenges. These include disproportionately low PSA levels relative to disease burden, likely attributable to tumor dedifferentiation, as well as the predominance of a sarcomatoid component on histopathology, with heterologous elements that may be present

or absent (4). Furthermore, immunohistochemistry poses diagnostic pitfalls in this malignancy due to significant overlap with true prostatic sarcomas and other primary mesenchymal neoplasms. In the present case, immunohistochemical findings supported sarcomatoid differentiation, with tumor cells showing positivity for smooth SMA and desmin, and a high proliferative activity (Ki-67 labeling index of approximately 18–20%). However, the absence of H-caldesmon expression argued against true smooth muscle differentiation, thereby excluding leiomyosarcoma. Additionally, negative staining for myogenin, S100, CD34, and CD117 helped rule out rhabdomyosarcoma, neural or melanocytic tumors, solitary fibrous tumor, and gastrointestinal stromal tumor, respectively. These findings highlight the importance of a comprehensive immunohistochemical panel, interpreted in conjunction with histomorphology, to distinguish sarcomatoid carcinoma of the prostate from its histologic mimics. As our patient presented with metastatic disease, an initial biopsy was performed from the rib lesion, followed by immunohistochemical evaluation. Subsequently, a prostate biopsy was obtained to establish the primary site. However, the limited tissue available in the core biopsy was sufficient only to confirm a prostatic origin, and additional epithelial immunohistochemical markers that could have further strengthened diagnostic confirmation could not be performed due to tissue constraints and limited availability in our setting.

In a recent single-institutional study by Tekin *et al.* (4), eight patients were evaluated to characterize the molecular landscape of sarcomatoid carcinoma of the prostate. Of these, three patients (37.5%) had a prior history of acinar adenocarcinoma prostate treated with radiation therapy, while five patients (62.5%) demonstrated mixed histology comprising adenocarcinoma and sarcomatoid components. Notably, seven patients (87.5%) either presented with distant metastasis at diagnosis or developed metastatic disease during follow-up. Our patient presented with bone metastases, the most frequently reported site of distant spread in sarcomatoid carcinoma of the prostate. Abiodun *et al*. (7) reported distant metastases in 83.3% of cases, with bone being the predominant site, underscoring the aggressive nature of this malignancy and its tendency for early systemic dissemination. There is no established standard treatment protocol for sarcomatoid carcinoma of prostate due to its rarity (8). For resectable tumors, surgery is the primary treatment, followed by adjuvant radiation therapy with or without chemotherapy in patients with positive margins or nodal disease (3). The prognosis of sarcomatoid carcinoma prostate is poor, with a reported one-year mortality risk of approximately 20% (9).

Sarcomatoid carcinoma of prostate is exceedingly rare; consequently, data on its clinical presentation, imaging features, immunohistochemical profile, and management remain limited. This case emphasizes on timely reporting of these cases and a coordinated, multidisciplinary approach involving oncologists, pathologists, and urologists.

Limitations

This case has certain limitations. The diagnosis was primarily based on immunohistochemical evaluation of the rib lesion, and the epithelial component was not assessed. A broader immunohistochemical panel, including additional epithelial markers, may have provided further diagnostic clarification and strengthened the distinction between a primary bone sarcoma arising synchronously with prostatic adenocarcinoma and a sarcomatoid variant of prostatic adenocarcinoma with bone metastasis, which cannot be confidently excluded in this case. Therefore, the interpretation of this report should be approached with caution, acknowledging the diagnostic limitations and emphasizing the need for clinicopathologic correlation.

CONCLUSIONS

Sarcomatoid carcinoma of the prostate is a highly aggressive malignancy, for which histopathological assessment supported by immunohistochemical evaluation is central to establishing the diagnosis. This case report underscores the need for heightened clinical awareness of the sarcomatoid variant of prostate cancer in the setting of bone metastasis. Owing to its rarity, standardized treatment recommendations for this entity are lacking. Therefore, multi-institutional collaboration to report individual patient data is essential to identify effective treatment approaches and improve survival outcomes in these patients.

COMPLIANCE WITH ETHICAL STANDARDS

Funding

None.

Conflicts of interest

The authors declare no competing interests.

Availability of data and material

All relevant data supporting this case report are included within the manuscript.

Authors' contributions

HSP, AR, VM: insight and valuable inputs to the manuscript. TK, DR: radiological images and data related to the case. PN, HS: writing - original draft, writing - review & editing.

Ethical approval

Ethical approval was not required for this study in accordance with institutional guidelines, as it involved the reporting of an individual case.
Written informed consent was obtained from the patient for publication of this article.

Publications ethics

Plagiarism

We hereby declare that this manuscript is an original work and has not been published or submitted for publication elsewhere. All appropriate references have been cited wherever required. This manuscript does not contain plagiarism.

Data falsification and fabrication

The authors declare that no data fabrication, falsification, or manipulation has been carried out in the preparation of this case report.

REFERENCES

1. Hafiani H, Hafiani I, Hafiani M. Sarcomatoid prostate carcinoma: a case report. BMC Urol. 2025;25(1):104. doi: 10.1186/s12894-025-01790-y.
2. Kench JG, Berney DM, De Marzo A, Egevad L, Kristiansen G, Litjens GJS, et al. Prostatic acinar adenocarcinoma. In: Amin Mahul B et al, editors. WHO Classification of Tumours Editorial Board. Urinary and male genital tumours.5th ed. Lyon (France): International Agency for Research on Cancer; 2022. p. 203-219.
3. Hansel DE, Epstein JI. Sarcomatoid carcinoma of the prostate: a study of 42 cases. Am J Surg Pathol. 2006;30(10):1316-21. doi: 10.1097/01.pas.0000209838.92842.bf.
4. Tekin B, Datta L, Zargham R, Sukov WR, Cheville JC, Herrera Hernandez L, et al. Sarcomatoid carcinoma of the prostate - A single institution experience with emphasis on molecular genetic findings. Hum Pathol. 2026;167:105988. doi: 10.1016/j.humpath.2025.105988.
5. Grignon DJ. Unusual subtypes of prostate cancer. Mod Pathol. 2004;17(3):316-27. doi: 10.1038/modpathol.3800052.
6. Jayasinghe KI, Abeysinghe AHMGB. Sarcomatoid carcinoma of the prostate presenting as bilateral cervical lymphadenopathy: a rare case report. Afr J Urol 2022;28(10). doi: 10.1186/s12301-022-00274-x.
7. Abiodun PA, Adetola D, Charles A, Habbeb TK, Martins M. Sarcomatoid carcinoma of prostate: A rare entity. J Case Rep 2014;4(1):33-37. doi: 10.17659/01.2014.0009.
8. Zizi-Sermpetzoglou A, Savvaidou V, Tepelenis N, Galariotis N, Olympitis M, Stamatiou K. Sarcomatoid carcinoma of the prostate: a case report. Int J Clin Exp Pathol. 2010 5;3(3):319-22.
9. Parada D, Peña KB, Riu F. Sarcomatoid carcinoma of the prostate: ductal adenocarcinoma and stromal sarcoma-like appearance: a rare association. Case Rep Urol. 2011;2011:702494. doi: 10.1155/2011/702494.