Case report

Plasma cell neoplasms mimicking solitary fibrous tumour

K.V Chathurika Wijegunarathna, K. Dissanayaka, S. Thanansayan

Department of Histopathology, National Hospital of Sri Lanka

Submitted on 20.07.2024. Accepted for publication on 03.06.2025.

Abstract

While plasma cell neoplasms typically display overt plasmacytoid morphology, unusual histologic variants can mimic soft tissue tumours such as solitary fibrous tumour (SFT). Critically, SFTs lack plasmacytoid differentiation, which is a key distinguishing feature. We present two cases in which plasma cell neoplasms mimicked SFT histologically, underscoring the importance of recognizing this pitfall.

Case 1: A L1-L2 lytic lesion in a 46-year-old woman was diagnosed on biopsy as SFT due to the presence of a "patternless" spindle-cell proliferation with hemangiopericytoma-like vessels. Excision revealed focal plasmacytoid cells, a feature that is not in keeping with SFT. This prompted immunohistochemistry (IHC) testing, which showed that the tumour cells were CD138+ plasma cells, confirming a plasma cell neoplasm.

Case 2: A 41-year-old man presented with a L2 fracture, that on histology exhibited a vascular tumour with staghorn vessels and diffuse plasmacytoid morphology. Further evaluation with IHC (CD138+) and serum analysis led to a diagnosis of multiple myeloma.

These cases demonstrate that plasmacytoid morphology, even if focal, should prompt consideration of plasma cell neoplasms. Pathologists must recognize this distinction, particularly in vascular-rich spindle-cell lesions, as misdiagnosis delays appropriate treatment.

Keywords: Plasma cell neoplasm, solitary fibrous tumour, hemangiopericytoma, plasmacytoid morphology, diagnostic pitfall

Introduction

Plasma cell neoplasms are composed of sheets of plasmacytoid cells and usually do not pose a diagnostic difficulty. However unusual architectural patterns have been described in the literature such as nested, pleomorphic, blastic, cleaved, clear cell, oncocytic and spindled cell variants posing a diagnostic dilemma(1). Angiomatous pattern mimicking a haemangioma has been described especially in cases of multiple myeloma where there is a proliferation of numerous blood vessels with some forming pseudo vascular spaces (2).

Angiogenesis is enhanced in the bone marrow in multiple myeloma and associated with a poor prognosis (3). Stromal cells in the bone marrow and neoplastic plasma cells secrete angiogenic factors including VEGF, basic

Corresponding author: Dr Chathurika Wijegunarathna
Department of Histopathology, National Hospital of Sri Lanka, Colombo, Sri Lanka
wijegunarathnac@yahoo.com

fibroblast growth factor (bFGF) and hepatocyte growth factor (HGF) (4, 5).

Solitary fibrous tumours have a fibroblastic origin with characteristic hemangiopericytoma-like blood vessels (6). They are dilated branching vessels which have a staghorn-like appearance (6). The cells in solitary fibrous tumour are arranged in a so called patternless pattern and have spindled to oval cells in a variably collagenized stroma (6).

Spinal solitary fibrous tumours are a rare entity with the most common location being thoracic spine followed by cervical and lastly lumbosacral spine (7). Radiologically a soft-tissue mass with accompanying osseous destruction is seen (7).

Histologically plasma cell neoplasms can have increasing vasculature owing to the overproduction of vasogenic cytokines (4). Even though, haemangioma like pattern is described, hemangiopericytoma like vessels are only reported in one case report describing a pulmonary plasmacytoma published in 1998 (8). Plasma cell neoplasms with cellular architectural features similar to solitary fibrous tumour have not been described in the literature.

One of the cases described here had cellular features of solitary fibrous tumour with only focal plasmacytoid appearance and the other case had overall plasmacytoid appearance with hemangiopericytoma like blood vessels.

Case report

Case 1: A 46-year-old woman presented with backache for four months. The computed tomography (CT) and magnetic resonance imaging (MRI) scans showed a lytic lesion in the L1 and L2 vertebrae with extension into soft tissues. The patient had anaemia, and the erythrocyte sedimentation rate (ESR) was elevated (106mm/1st hour). The initial biopsy of the lesion had been reported as a hemangiopericytoma (solitary fibrous tumour). However, immunohistochemical

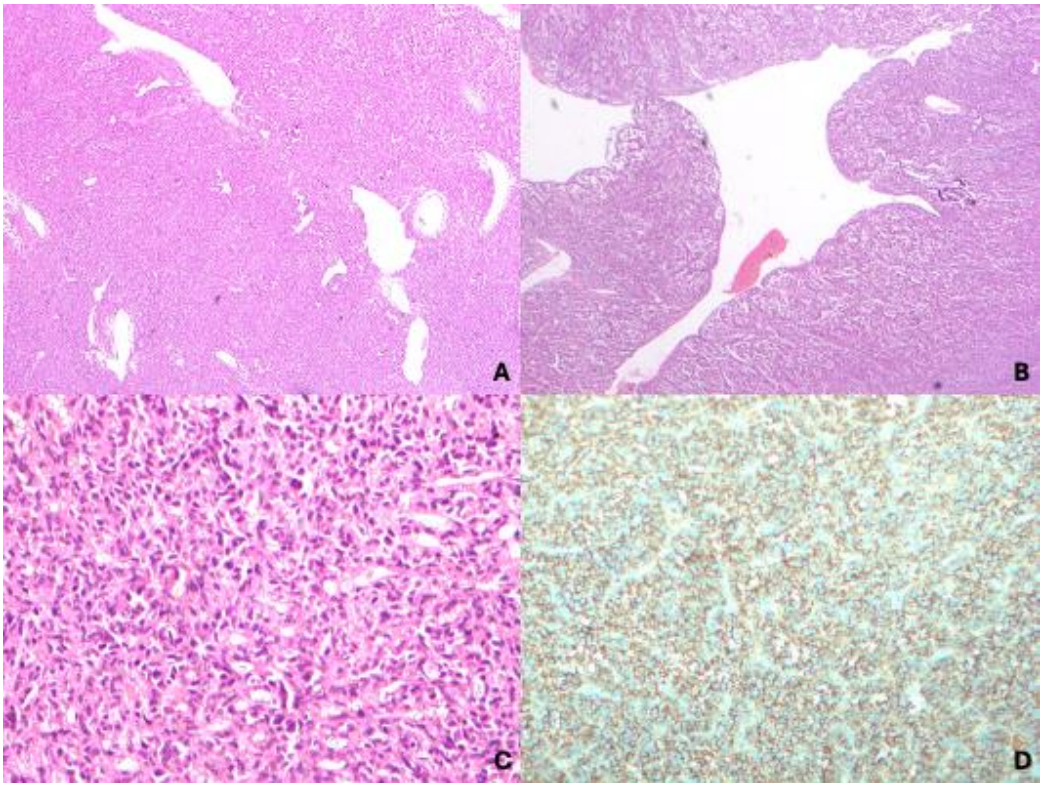

Figure 1: Case 1; The tumour showed staghorn vessels A) Haematoxylin and eosin (H&E) x100) B) (H&E X200) C) and haphazardly arranged small fusiform cells without plasmacytoid morphology (H&E x400) D) The cells showed diffuse membrane positivity for CD138 (CD 138 x400)

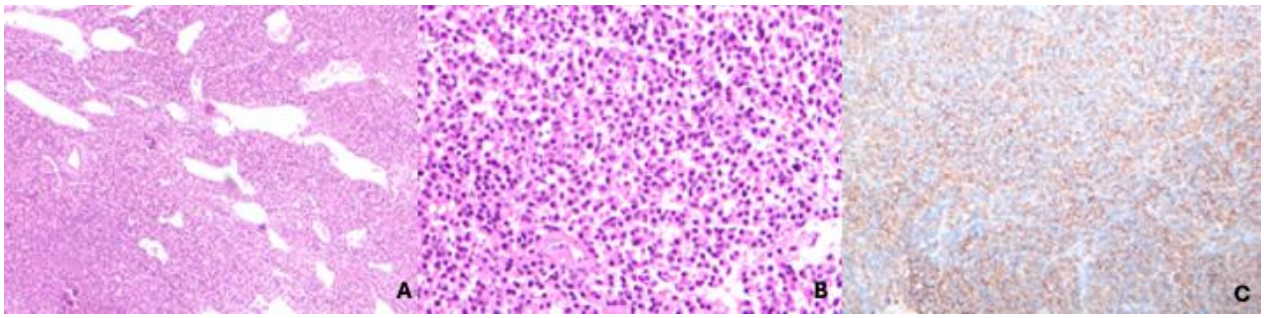

Figure 2: Case 2; A) The tumour shoed staghorn vessels (H&E x100) B) and sheets of plasmacytoid cells (H&E x400) C) The cells showed diffuse membrane positivity for CD138 (CD 138 x400)

confirmation was not done at the time. The patient had defaulted treatment and presented two years later with severe back pain and paraplegia. Spinal tumour debulking and posterior instrumentation was done. It was noted to be a highly vascular tumour during the surgery. On microscopy the resected tumour was vascular with prominent hemangiopericytoma-like blood vessels. It was composed of sheets of monomorphic round to oval cells with indistinct nuclear membranes and closely resembled cells of a solitary fibrous tumour. However, a plasmacytoid appearance was seen focally. Immunohistochemically, the tumour was negative for CD34. LCA and CD56 were focally positive. CD138 showed a diffuse positivity in the tumour cells. It was diagnosed to be a plasma cell neoplasm.

Case 2: A 41year old man presented with a pathological fracture in the L2 vertebra. Prior to the fracture he had experienced back pain for several months. MRI was suggestive of a haemangioma. It was noted to be a highly vascular tumour during the surgery. The histology showed sheets of plasmacytoid cells. Multiple hemangiopericytoma like vessels were seen. Immunohistochemically the cells showed diffuse positivity for CD138. Further investigations revealed Bence-Jones protein in the urine, a M protein on serum electrophoresis and hypergammaglobulinemia. A diagnosis of multiple myeloma was made.

Discussion and Conclusion

Plasma cell neoplasms have varying histological patterns. However, a solitary fibrous tumour-like appearance has not been described in the literature to date. A previously reported case showed hemangiopericytoma-like vessels and cells with a plasmacytoid appearance, similar to the second case (8). In addition to hemangiopericytoma-like blood vessels, the first case showed cellular features similar to a solitary fibrous tumour with a focal plasmacytoid appearance. This is a potential diagnostic pit fall. Therefore, it is important that the diagnosis of solitary fibrous tumour is confirmed by immunohistochemistry (STAT6) or molecular studies (NAB2-STAT6 translocation). Using CD34 alone can be a diagnostic pitfall since a subset of neoplastic plasma cells can express CD34 (9).

Various morphologies of solitary fibrous tumour have been described including giant cell rich and fat forming types (10). However, cells with a plasmacytoid appearance have not been described. Therefore, these two cases highlight that even a focal plasmacytoid pattern in a tumour with a prominent staghorn vascular pattern should alert the pathologist of a possible plasma cell neoplasm to avoid misdiagnosis as a solitary fibrous tumour.

References

1. Banerjee SS, Verma S, Shanks JH. Morphological variants of plasma cell tumours. *Histopathology*. 2004;44(1):2-8. doi:10.1111/j.1365-2559.2004.01763.x

2. Nandedkar MA, Abbondanzo SL, Miettinen M. Extramedullary manifestation of multiple myeloma (systemic plasmacytoma) that simulates hemangioma. *Arch Pathol Lab Med*. 2000;124(4):628-631. doi:10.5858/2000-124-0628-EMOMMS

3. Bhatti SS, Kumar L, Dinda AK, Dawar R. Prognostic value of bone marrow angiogenesis in multiple myeloma: use of light microscopy as well as computerized image analyzer in the assessment of microvessel density and total vascular area in multiple myeloma and its correlation with various clinical, histological, and laboratory parameters. *Am J Hematol*. 2006;81(9):649-656. doi:10.1002/ajh.20639

4. Jakob C, Sterz J, Zavrski I, et al. Angiogenesis in multiple myeloma. *Eur J Cancer*. 2006;42(11):1581-1590. doi:10.1016/j.ejca.2006.02.017

5. Iwasaki T, Hamano T, Ogata A, Hashimoto N, Kitano M, Kakishita E. Clinical significance of vascular endothelial growth factor and hepatocyte growth factor in multiple myeloma. *Br J Haematol*. 2002;116(4):796-802. doi:10.1046/j.0007-1048.2002.03364.x

6. Shastri M, Gupta N, Dey P, Srinivasan R, Radotra B. Cytomorphological spectrum of solitary fibrous tumour: revisited. *Cytopathology*. 2022;33(6):688-695. doi:10.1111/cyt.13163

7. Keraliya AR, Tirumani SH, Shinagare AB, Zaheer A, Ramaiya NH. Solitary Fibrous Tumors: 2016 Imaging Update. *Radiol Clin North Am*. 2016;54(3):565-579. doi:10.1016/j.rcl.2015.12.006

8. Koss MN, Hochholzer L, Moran CA, Frizzera G. Pulmonary plasmacytomas: a clinicopathologic and immunohistochemical study of five cases. *Ann Diagn Pathol*. 1998;2(1):1-11. doi:10.1016/s1092-9134(98)80029-4

9. Kuranda K, Berthon C, Dupont C, et al. A subpopulation of malignant CD34+CD138+B7-H1+ plasma cells is present in multiple myeloma patients. *Exp Hematol*. 2010;38(2):124-131. doi:10.1016/j.exphem.2009.11.008

10. Thway K, Ng W, Noujaim J, Jones RL, Fisher C. The Current Status of Solitary Fibrous Tumor: Diagnostic Features, Variants, and Genetics. *Int J Surg Pathol*. 2016;24(4):281-292. doi:10.1177/1066896915627485