DOI: 10.7860/JCDR/2022/57557.16923

Case Report

Pathology Section

Monophasic Synovial Sarcoma of Foot Masquerading Squamous Cell Carcinoma

SAKTHI KANNAMMA[1], SANKAPPA P SINHASAN[2], SARAVANAN PANDIAN[3]

ABSTRACT

Synovial sarcoma being a rare sarcoma typically arises near articular surface most commonly around knee joint. Hereby, a case report of a 38-year-old male with complaint of cauliflower-like proliferative growth on the plantar aspect of left foot. It rapidly progressed in size over a period of one month. Wedge biopsy was done and diagnosis of malignant mesenchymal tumour was suggested. Further clinical workup of the case was carried out and the surgeons proceeded with amputation of the foot. Gross examination of specimen showed a large, ulcerated, nodular, exophytic, cauliflower-like growth over the plantar aspect of left foot along with areas of haemorrhage and necrosis masquerading more common squamous cell carcinoma. Histopathology revealed characteristic hypocellular and hypercellular areas showing pleomorphic spindle cells in fascicles and whorls suggesting monophasic synovial sarcoma. Immunohistochemistry stains further confirmed the diagnosis. The current case report highlights the rare presentation of synovial sarcoma as a cauliflower type of growth at a rare location.

Keywords: Cauliflower-like growth, Foot, Plantar aspect

CASE REPORT

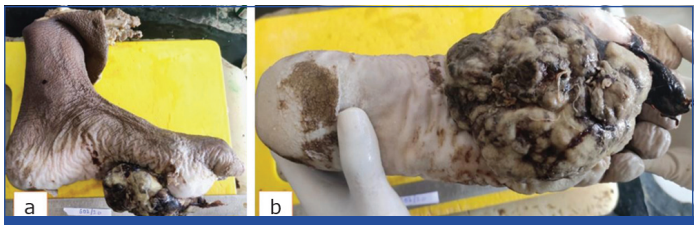
A 38-year-old male presented to the Surgery Outpatient Department (OPD), with complaint of progressive lesion over the left foot for the past one-month duration. There was no history of any trauma and he was farmer by occupation working in the agriculture field as a labourer. The growth was rapidly progressive in size. History revealed that it started as painless mass, but recently he started developing pain, which brought him to the hospital. He also said that the mobility was restricted due to progressive lesion.

Clinical examination revealed a huge cauliflower-like proliferative growth on the plantar aspect of left foot measuring 7×7 cm [Table/Fig-1a]. The lesion was dark brown to black in colour with irregular margins. Haemorrhagic and necrotic areas were also observed on the surface of the lesion. Bleeding on provocation was also noted. Routine investigations like complete blood count, biochemical tests, chest X-ray were normal. The X-ray of left foot showed soft tissue growth with no bony involvement [Table/Fig-1b]. Based on these findings, provisional diagnosis of squamous cell carcinoma or malignant melanoma was made and then the Surgeon posted the case for wedge biopsy. Histopathological report suggested suspicion for malignant mesenchymal tumour probably synovial sarcoma with a differential diagnosis of dermatofibrosarcoma.

The chest X-ray was clear without any evidence of metastasis. Surgeon proceeded with left leg below-knee-amputation under general anaesthesia after explaining the malignant nature of the tumour and taking the informed written consent from the patient.

[Table/Fig-1]: a) Clinical photograph of the lesion showing a huge cauliflower-like proliferative growth on plantar aspect of left foot. b) X-ray of left foot showing soft tissue growth with no bony involvement.

The below-knee-amputated specimen was sent to histopathology section. Grossly the lesion appeared pedunculated, nodular, exophytic, cauliflower-like growth measuring 10×8.5×1.5 cm involving the plantar aspect of left foot [Table/Fig-2]. Outer surface was grey white to dark brown with area of necrosis and haemorrhage. Skin surface showed areas of ulcerations. The growth was 3.5 cm away from the left great toe,10 cm away from the heel of foot, 2.5 cm away from medial margin and 1.2 cm away from lateral margin. Cut-section of tumour was grey brown to dark black with areas of haemorrhage and necrosis. The underlying metatarsal bones appeared uninvolved grossly and deep surgical margin was inked by acrylic dyes. Proximal resected margin showed cut end of tibia and fibula along with muscle bundles and neurovascular bundles. Multiple sections were submitted from tumour proper and all the surgical margins including sections from the underlying metatarsal bones to know infiltration.

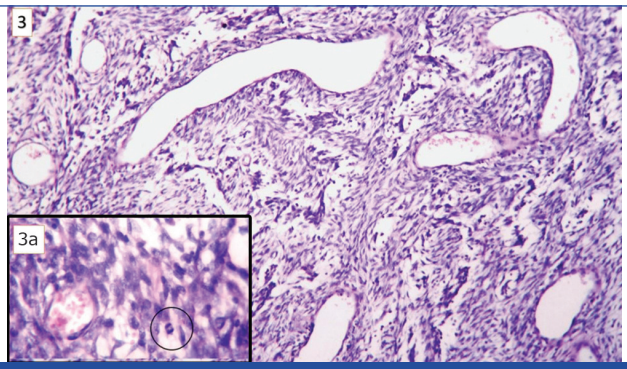


[Table/Fig-2]: a,b) Amputated specimen showing pedunculated, bosselated, nodular, exophytic, cauliflower-like growth involving the plantar aspect of left foot.

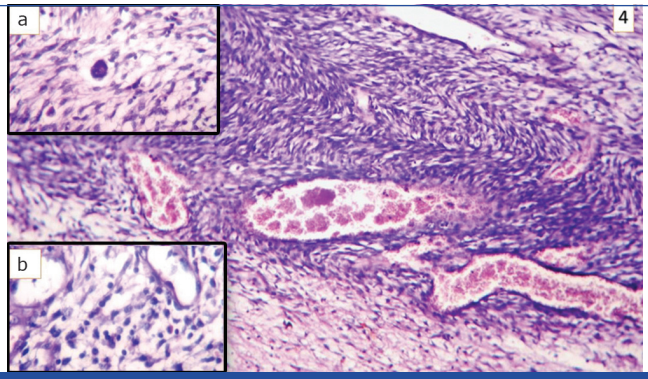
Histopathological examination of tumour proper showed malignant soft tissue tumour partially covered by skin. The skin showed areas of ulceration with ulcerated area showing granulation tissue formation and inflammatory exudates. The tumour extended from papillary dermis deep into subcutaneous tissue. The tumour cells were arranged in intersecting fascicles, bundles, whorls, haemangiopericytoma pattern with hypo and hypercellular areas, admixed with extensive areas of necrosis and haemorrhage. The hypercellular area was composed of spindle to elongated cells with nucleus having coarse chromatin with moderate degree of pleomorphism. The mitotic activity [Table/Fig-3] at the hypercellular area varied from 10-19/HPF. Very occasional pleomorphic multinucleate tumour giant cells were also seen [Table/Fig-4a]. The stroma was made up of fibrocollagenous

matrix with numerous dilated blood vessels and focal aggregates of lymphocytes and plasma cells [Table/Fig-4b]. The hypocellular area showed myxomatous degeneration of stroma containing the same tumour cells. There was no evidence of squamous cells or squamoid differentiation anywhere in the sections studied. All surgical margins were free of tumour. No lymphovascular invasion was noted. There was no involvement of underlying metatarsal bones in multiple sections studied.

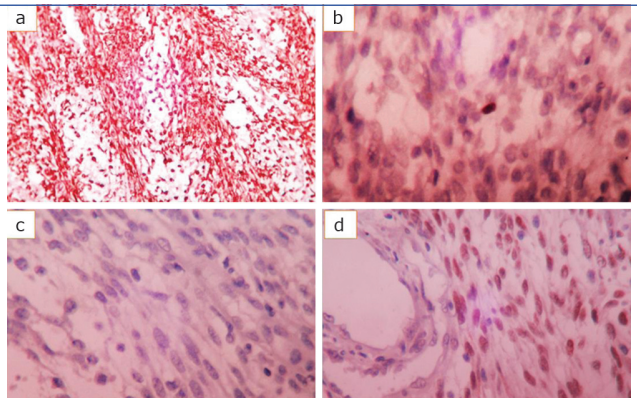
Based on these findings, the diagnosis of monophasic synovial sarcoma was given. Since the location (plantar aspect of foot) was very unusual for diagnosis of synovial sarcoma, Immunohistochemistry (IHC) was carried out for further confirmation and to substantiate the diagnosis. Panel of IHC markers were carried out and tumour cells showed strong positivity for Vimentin, but Desmin, P-63 and HMB-45 were negative [Table/Fig-5a,b,c]. Finally, tumour specific TLE-1 showed strong nuclear positivity [Table/Fig-5d] confirming the diagnosis of monophasic synovial sarcoma. Final diagnosis of "monophasic synovial sarcoma of left foot, Fédération Nationale des Centres de Lutte Contre le Cancer (FNCLCC) grading [1] – histological grade 3 (Necrosis: 20-50%, Mitotic rate: 10-19/HPF), TNM staging: pT2aNx). One year follow-up of the case was uneventful. Patient was referred to higher tertiary care centre and one year follow of the case was uneventful. However, patient has been advised for long-term follow-up.



[Table/Fig-3]: Histopathological examination showing tumour cells with haemangiopericytoma pattern of arrangement of cells (H&E, 10x magnification). The cells are spindle to elongated cells with nucleus having coarse chromatin with moderate degree of pleomorphism showing brisk mitotic activity (inset) (H&E, 40x magnification).



[Table/Fig-4]: Histopathological examination showing tumour cells arranged in herring bone pattern, intersecting fascicles and bundles and whorls (H&E, 10x magnification); note occasional pleomorphic multinucleate tumour giant cells Inset a. The stroma showing sprinkling of lymphocytes and plasma cells Inset b. (Both H&E, 40x magnification).



[Table/Fig-5]: a) Tumour cells showed strong positivity for Vimentin (10x magnification), b) magnification 40x and c) magnification 40x. d) Tumour specific TLE-1 showed strong nuclear positivity confirming the diagnosis of monophasic synovial sarcoma (40x magnification).

DISCUSSION

Synovial sarcoma is a deep soft tissue sarcoma of lower and upper extremities. About 70% of cases are reported in the juxta-articular regions and less than 15% arise in trunk and very minimal percentage of cases are reported in head and neck regions [2,3]. Literature reports external genitalia, retroperitoneal organs, bone, central nervous system and peripheral nervous system to be extremely rare sites of involvement by synovial sarcoma [4]. They usually present clinically as long-standing, painful swelling often slow growing giving impression of benign tumours; but at the same time when aggressive, they have been found to erode the adjacent bone. Grossly these tumours can reach a maximum size up to 10 cm with a tan-grey to yellowish multinodular soft to firm tumour. At times, calcification and necrosis have also been reported. Majority of the cases are reported before the age of 50 years and they are specifically characterised by SS18:SSX1 fusion gene [5]. We present this case report due to its unusual appearance of a large cauliflower-like proliferative exophytic growth over the superficial plantar aspect of foot with no bony involvement.

Synovial sarcoma, also known by the term Malignant synovioma, is a malignant neoplasm of soft tissue, having its origin from the pluripotential cells near the articular surface. It accounts for 8-10% of all sarcomas. It typically affects subjects belonging to age group of 15-40 years of age with slight male predilection [2,3]. The present case falls in this age group in male patient.

Review of literature states that about 90% of these cases occur in the extremities with the most common site being the knee and then comes the ankle and least common is the foot. Cases of synovial sarcoma has been reported in the head and neck region [4,5]. Lesions of the foot are initially slow growing and painless but later become painful [6]. The present case also had a similar history of painless progressive mass lesion which later turned out to be extremely painful and then he was completely immobilised.

The gross pathological appearance of most cases of synovial sarcoma is a large tan or grey mass with multinodularity or multicystic surface [7,8]. This is where the present case report uniqueness by manifesting as a proliferative cauliflower-like lesion with extensive areas of ulceration, haemorrhage and necrosis. The size of most synovial sarcoma ranges from 3-6 cm and smaller ones are mostly reported in hands and feet [9,10]. The present case it was quite a huge tumour of size 10×8 cm manifesting in the foot. The initial gross differential diagnosis which came to our mind at the first look of this tumour was squamous cell carcinoma due to it cauliflower appearance. We also considered diagnosis of malignant melanoma as the tumour was dark brown to black in colour due to extensive haemorrhage. Histopathology sections showed features suggestive of monophasic synovial sarcoma and malignant melanoma was excluded by IHC studies. Positivity for tumour specific TLE-1, helped us to confirm diagnosis as monophasic synovial sarcoma. However, molecular diagnostic workup with oncogenic fusion protein SS18:SSX was not carried out due to cost factors and unavailability at our setup.

Histologically, variants of synovial sarcoma include monophasic variant, biphasic variant and poorly differentiated. Monophasic means only spindle cell component whereas biphasic means spindle and epithelial cells. Rare cases manifest with calcification and ossification. Immunohistochemistry has a crucial role in diagnosing soft tissue tumours. In synovial sarcoma they show a differential

expression of Bcl-2. Studies reveal that around 60% cases stain positive for CD99 and almost all cases of synovial sarcoma show strong and diffuse nuclear staining for Transcriptional corepressor TLE-1 [10,11]. The present case showed strong and diffuse positivity with nuclear staining for TLE-1. Literature reveals a new tumour marker NYESO-1 now being strongly expressed in most cases of synovial sarcoma and also aids in differentiating from other spindle cell tumours [11].

More than 95% of cases of synovial sarcoma shows translocation (X:18) at molecular level. The oncogenic fusion protein associated are SS18:SSX. The various subtypes of SSX are X1, X2 and very rarely X4. Occasional cases have reported translocation in (X:20). This translocation can be detected both by Fluorescent in-situ hybridisation and Real Time-Polymerase Chain Reaction (RT-PCR) methods [10,11].

Surgical excision with clear margins along with radiotherapy or chemotherapy is the main line of management. Few years back amputation was the only mode of management but with recent advances limb salvage surgery is also considered. Neoadjuvant therapy is generally considered for larger tumours of size more than 5 cm. Intensity modulated radiation therapy is becoming the most preferred method of radiation delivery in patients with soft tissue sarcoma. Neoadjuvant chemotherapies being used include Ifosfamide and Doxorubicin. This is considered a choice only in cases of unresectable tumours or where in the tumour has already metastasised [12,13].

Novel agents are being developed for targeted therapy. They include Tyrosine kinase receptor inhibitor which is Pazopanib approved for clinical use. Other drugs in clinical trial includes Epigenetic modifiers and Immunotherapeutic agents. Studies have revealed the five-year survival rate being 23.5-64% and 10 years survival rate is 11.2-34% [13].

CONCLUSION(S)

This case is reported due to the rare incidence of synovial sarcoma in the sole of foot and also its rare morphological presentation as pigmented ulcerated lesion masquerading melanoma and squamous cell carcinoma due to its cauliflower-like appearance. Panel of IHC marker studies have become essential part of diagnostic workup to confirm such a rare tumour.

REFERENCES

[1] Guillou L, Coindre JM, Bonichon F, Nguyen BB, Terrier P, Collin F, et al. Comparative study of the National Cancer Institute and French Federation of Cancer Centers Sarcoma Group grading systems in a population of 410 adult patients with soft tissue sarcoma. J Clin Oncol. 1997;15(1):350-62. Doi: 10.1200/JCO.1997.15.1.350. PMID: 8996162.

[2] Kadapa NP, Reddy LS, Swamy R, Kumuda, Reddy MV, Rao LM. Synovial sarcoma oropharynx - A case report and review of literature. Indian J Surg Oncol. 2014;5(1):75-77.

[3] Cihak RA, Lydiatt WM, Lydiatt DD, Bridge JA. Synovial sarcoma of the head and neck: chromosomal translation (X;18) as a diagnostic aid. Head Neck. 1997;19(6):549-53.

[4] Mamelle G, Richard J, Luboinski B. Synovial sarcoma of the head and neck: An account of four cases and review of the literature. Eur J Surg Oncol.1986;12(4):347-49.

[5] Gazendam AM, Popovic S, Munir S, Parasu N, Wilson D, Ghert M. Synovial Sarcoma: A Clinical Review. Curr. Oncol. 2021;28(3):1909-20.

[6] Michal M, Fanburg-Smith J, Lasota J,Fetsch JF.,Lichy J, Miettinen M. Minute synovial sarcomas of the hands and feet: A clinicopathologic study of 21 tumors less than 1 cm. Am J Surg Pathol. 2006;30(6):721-26.

[7] dos Santos NR, de Bruijn DR, van Kessel AG. Molecular mechanisms underlying human synovial sarcoma development. Genes Chromosomes Cancer.2001;30(1):1-14.

[8] Amary MF, Berisha F, BernardiFdel C, Herbert A, James M, Reis-Filho JS, et al. Detection of SS18-SSX fusion transcripts in formalin-fixed paraffin-embedded neoplasms: Analysis of conventional RT-PCR, QRT-PCR and dual color FISH as diagnostic tools for synovial sarcoma. Mod. Pathol. 2007;20(4):482-96.

[9] Biau DJ, Ferguson PC, Chung P, Griffin AM, Catton CN, O'Sullivan B, et al. Local recurrence of localized soft tissue sarcoma: A new look at old predictors. Cancer. 2012; 118(23):5867-77.

[10] Naing KW, Monjazeb AM, Li CS, Lee LY, Yang A, Borys D, et al. Perioperative radiotherapy is associated with improved survival among patients with synovial sarcoma: A SEER analysis. J Surg Oncol. 2015;111(2):158-64.

[11] Song S, Park J, Kim HJ, Kim IH, Han I, Kim HS, et al. Effects of adjuvant radiotherapy in patients with synovial sarcoma. Am J Clin Oncol. 2017;40(3):306-11.

[12] Davis AM, O'Sullivan B, Turcotte R, Bell R, Catton C, Chabot P, et al. Late radiation morbidity following randomization to preoperative versus postoperative radiotherapy in extremity soft tissue sarcoma. Radiother Oncol. 2005;75(1):48-53.

[13] Wang J, Song Y, Liu X, Jin J, Wang W, Yu Z, et al. Comparison of outcome and toxicity of postoperative intensity-modulated radiation therapy with two-dimensional radiotherapy in patients with soft tissue sarcoma of extremities and trunk. Cancer Med. 2019;8(3):902-09.

PARTICULARS OF CONTRIBUTORS:
1. Postgraduate Student, Department of Pathology, Indira Gandhi Medical College and Research Institute, Puducherry, India.
2. Professor, Department of Pathology, All India Institute of Medical Sciences (AIIMS), Guwahati, Assam, India.
3. Assistant Professor, Department of General Surgery, Indira Gandhi Medical College and Research Institute, Puducherry, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Sankappa P Sinhasan,
Professor, Department of Pathology, All India Institute of Medical Sciences (AIIMS), Guwahati, Assam, India.
E-mail: drspsinhasan@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: May 21, 2022
- Manual Googling: Jun 29, 2022
- iThenticate Software: Sep 27, 2022 (5%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **May 10, 2022**
Date of Peer Review: **Jun 14, 2022**
Date of Acceptance: **Jul 14, 2022**
Date of Publishing: **Oct 01, 2022**