Progression to Pleomorphic Dermal Sarcoma Following Recurrence of Atypical Fibroxanthoma

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Introduction

Atypical fibroxanthoma (AFX) is a rare form of skin cancer that often appears as an erythematous or ulcerated nodule. It most commonly occurs in the head and neck region among elderly individuals [1]. AFX tumors are circumscribed, exophytic masses that are contained within the dermal layer. Histologic examination exhibits multiple atypical spindle and epithelioid cells consisting of hyperchromatic or pleomorphic vesicular nuclei [2]. Although AFX tends to be less malignant than other forms of skin cancer, there is potential for recurrence, metastasis, and progression to pleomorphic dermal sarcoma, a more aggressive tumor [3]. The recommended treatment is Mohs surgery or wide local excision with margins of at least 1-2 cm [4]. Recurrence is rare when appropriate surgical margins are achieved, with reported rates of 5-11%. Risk of metastasis has been reported to range from 1-2% [5].

Pleomorphic dermal sarcoma (PDS) is considered to be much more aggressive of a tumor that has a higher rate of local recurrence and metastasis than atypical fibroxanthoma. Pleomorphic dermal sarcomas have similar histological patterns to atypical fibroxanthoma, however they demonstrate deeper subcutaneous invasion, necrosis, and lymphovascular/perineural invasion. These types of tumors are often ulcerated and are of a larger size (median of 25 mm) [6]. Risks of recurrence and metastasis have been reported at 7-69% and 4-20%, respectively [5].

Case Summary

We present a case of post-auricular AFX, which progressed to PDS, in a 70-year-old male with a past medical history of liver transplant 4.5 years prior. He has since been on immunosuppressive therapy. The post-auricular nodule was first identified at a dermatology visit. A shave biopsy was performed, with pathology suggestive of AFX. He was prescribed topical fluorouracil, which was unsuccessful. He presented 3 months later with a 1.5 cm left post-auricular nodule. The nodule was treated by wide local excision with 20 mm margins and split-thickness skin graft.

Histological examination of the specimen demonstrated AFX. All margins were uninvolved by the tumor and no lymphovascular or perineural invasion was identified. However, there was evidence of tumor involvement within 5 mm of the deep margin.

Seven months later, the patient developed recurrence of the nodule along the anterior border of the previous excision. Fine needle aspiration confirmed recurrence of the AFX. Wide local excision with 15-20 mm margins and split-thickness skin graft was performed. The tumor was described to extend to the deep margin on the pathology report, and was determined to be most consistent with a high-grade pleomorphic dermal sarcoma. The patient was referred to radiation oncology to receive 6 weeks of adjuvant radiation therapy given the aggressive nature of PDS. It is yet to be seen if he will have another recurrence or distant metastasis.

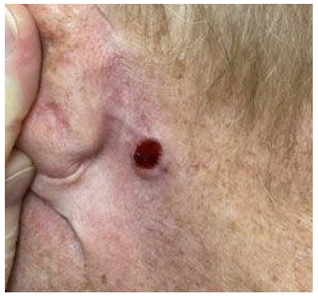

Figure 1. 1.5 cm post-auricular nodule on initial presentation

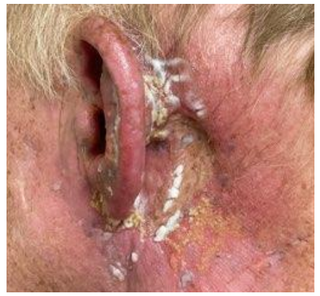

Figure 2. Post-auricular region on the last day of radiation

Discussion

Our case demonstrates the rare presentation of recurrent AFX after wide local excision with 2 cm margins, which further progressed to PDS. While previous cases have reported PDS in kidney transplant [8], lung transplant [8], and heart transplant recipients [9], this is a unique case of PDS in a liver transplant recipient. To our knowledge, it is the first reported case of PDS in a patient with liver transplantation. One multicenter retrospective cohort study determined AFX and PDS to be more aggressive with higher rates of metastasis among solid organ transplant recipients [10].

Cases of recurrent AFX and progression to PDS among solid organ transplant recipients have been reported. One such case occurred in an 82-year-old heart transplant recipient. Successful treatment of this case involved radical excision with adjuvant radiation therapy, which has kept the patient free of recurrence and metastasis for 4 years [9]. Another case involved a 68-year-old male patient who had previously received a lung transplant. The patient developed metastases to the liver, lungs, and small bowel, which were discovered with PET-CT. Treatment with doxorubicin, radiation therapy, pazopanib, and pembrolizumab was trialed. Unfortunately, the patient subsequently developed septic shock and respiratory failure secondary to pneumonia, and succumbed to their condition [10].

Recurrence of AFX tends to present within the first three years following excision [5]. In patients with recurrence, it is important to consider adjuvant therapies, such as radiation and chemotherapy. Recommended follow-up has been reported based on a Danish cohort study of 1118 patients, with 945 patients diagnosed with AFX and 173 patients diagnosed with PDS. The authors recommend annual examinations over 4 years for patients with AFX, but do not recommend imaging. For patients with PDS, the recommendation is to follow-up every 6 months for 3 years, followed by annual visits for at least another year, with all visits requiring a PET/CT scan [5]. Our patient continues to be treated with adjuvant radiation therapy and will be monitored with close follow-up for recurrence and metastasis.

References

1. Sakamoto A, Oda Y, Itakura E, et al. Immunoexpression of Ultraviolet Photoproducts and p53 Mutation Analysis in Atypical Fibroxanthoma and Superficial Malignant Fibrous Histiocytoma. *Modern pathology*. 2001;14(6):581-588. doi:10.1038/modpathol.3880354
2. Pesapane F, Nazzaro G, Lunardon L, Coggi A, Gianotti R. Two friends with eroded nodules on the ears: atypical fibroxanthoma case report. *An Bras Dermatol*. 2015;90(4):577-579. doi:10.1590/abd1806-4841.20153313
3. Ørholt M, Aaberg FL, Abebe K, et al. Risk factors for local atypical fibroxanthoma recurrence and progression to pleomorphic dermal sarcoma: A meta-analysis of individualized participant data. J Surg Oncol. 2022;126(3):555-562. doi:10.1002/jso.26898
4. Jibbe A, Worley B, Miller CH, Alam M. Surgical excision margins for fibrohistiocytic tumors, including atypical fibroxanthoma and undifferentiated pleomorphic sarcoma: A probability model based on a systematic review. *J Am Acad Dermatol*. 2022;87(4):833-840. doi:10.1016/j.jaad.2021.09.036
5. Ørholt M, Abebe K, Rasmussen LE, et al. Atypical fibroxanthoma and pleomorphic dermal sarcoma: Local recurrence and metastasis in a nationwide population-based cohort of 1118 patients. J Am Acad Dermatol. 2023;89(6):1177-1184. doi:10.1016/j.jaad.2023.08.050
6. Miller K, Goodlad JR, Brenn T. Pleomorphic dermal sarcoma: adverse histologic features predict aggressive behavior and allow distinction from atypical fibroxanthoma. *Am J Surg Pathol*. 2012;36(9):1317-1326. doi:10.1097/PAS.0b013e31825359e1
7. Perez AN, Dashti NK, Cates JMM. Prognostic factors for pleomorphic dermal sarcoma: analysis of 1911 cases from the SEER database. J Clin Pathol. 2023;76(6):424-428. doi:https://doi-org.unr.idm.oclc.org/10.1136/jcp-2022-208570
8. Azin M, Ameri AH, Foreman RK, Neel VA, Lorenzo ME, Demehri S. Lethal Dermal Sarcoma in Immunosuppressed Patients. Oncologist. 2022;27(9):e759-e761. doi:10.1093/oncolo/oyac141
9. Ripa V, Singh N, Star AE, Smith F. Progression of the atypical fibroxanthoma to pleomorphic dermal sarcoma in a heart transplant patient. BMJ Case Rep. 2021;14(7):e242359. Published 2021 Jul 2. doi:10.1136/bcr-2021-242359
10. Bouni, M., Guerra, R., Viveiros, M., Hobayan, C. G., Carr, D., & Shahwan, K. (2024). Progression of Atypical Fibroxanthoma to Metastatic Pleomorphic Dermal Sarcoma in a Lung Transplant Recipient. SKIN The Journal of Cutaneous Medicine, 8(2), 1431–1434. https://doi.org/10.25251/skin.8.2.13