

## Polypoidal Manifestation of Multiple Poromas: Possible Drug Involvement

Yuichi YOSHIDA, Nanako YAMADA and Osamu YAMAMOTO

Division of Dermatology, Department of Medicine of Sensory and Motor Organs, Faculty of Medicine, Tottori University, 86 Nishi-cho, Yonago-shi, Tottori 683-8503, Japan. E-mail: yxyhifu1@tottori-u.ac.jp

Accepted Sep 24, 2020; Epub ahead of print Sep 28, 2020

We report here a case of multiple pedunculated poromas in a patient with rheumatoid arthritis treated with methotrexate.

### CASE REPORT

A 76-year-old Japanese woman was referred to our clinic for evaluation of a 3-year history of multiple reddish nodules. She had a medical history of breast cancer 12 years previously. She had also been treated for 4 years with oral methotrexate (8 mg/week) for rheumatoid arthritis. Physical examination revealed multiple pedunculated nodules, approximately 4–5 mm in diameter, on both hands, face and trunk (4 nodules in total) (**Fig. 1**). The tumours were suspected to be pyogenic granulomas or skin tags, and were resected under local anaesthesia. Histopathologically, the entire tumour consisted of broad, anastomosing bands connected to the epidermis in a polypoid fashion (**Fig. 2a**). Tumour cells were composed of cuboidal poroid cells and eosinophilic cuticular cells. Small ductal structures were also seen (**Fig. 2b**). The tumour stroma was rich in vessels and eosinophilic hyalinized collagen (**Fig. 2c**). Based on these findings, a diagnosis of poromatosis in association with methotrexate treatment was made.

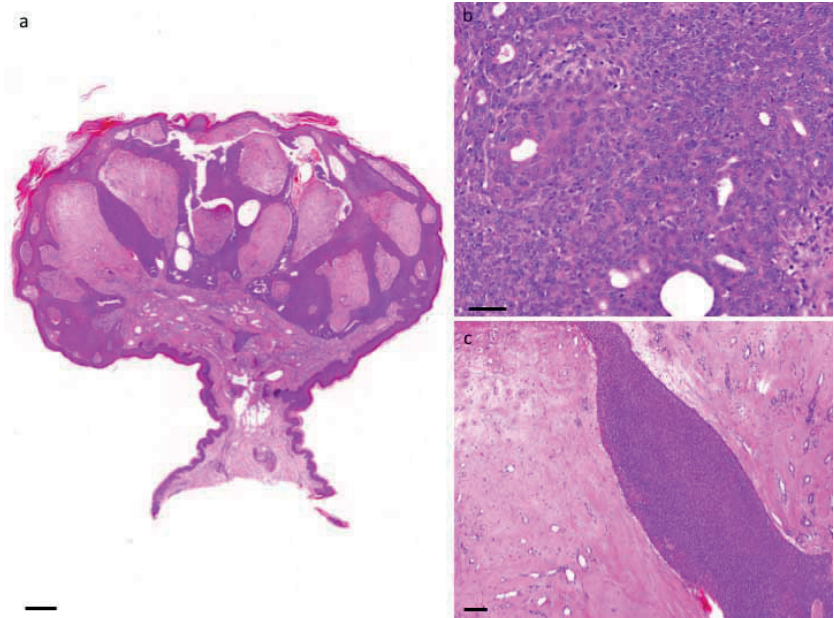
### DISCUSSION

Poroma is a relatively common adnexal neoplasm that presents as a dome-shaped nodule in areas with abundant eccrine sweat glands. It occasionally occurs as multiple lesions, known as poromatosis. Although its pathogenesis remains to be elucidated, most cases of multiple poromas



**Fig. 1.** A polypoidal nodule on the trunk.

occur in patients who have received radiotherapy or cancer chemotherapy (1–15). An immunosuppressive condition might be involved in the development of multiple poromas. We reviewed previous reports on cases of multiple poromas related to medical treatment (**Table I**). Men accounted for 75% of patients. The tumours arose not only on the hands or feet, but also on the trunk and face. Eighteen (90%) of 20 cases had underlying neoplasms, especially haematological malignancies. Interestingly, the tumour in 13 cases (65%) had a polypoidal appearance. In addition, multiple polypoidal poromas developed in 4 cases, including the current case, and these were treated with methotrexate. Cases of multiple



**Fig. 2. Histopathology of the tumour.** (a) The tumour consisted of broad, anastomosing bands connected to the epidermis with a polypoid appearance (bar: 500  $\mu$ m). (b) Tumour cells consisted of round-shaped poroid cells and eosinophilic cuticular cells. Small ductal structures were also seen (bar: 50  $\mu$ m). (c) The stroma of the tumour was rich in vessels and eosinophilic hyalinized collagen (bar: 100  $\mu$ m; H&E staining).

**Table I. Drug-induced multiple poromas**

Reference	Age, years	Sex	Poromas n	Location	Underlying disease	Polypoidal appearance	Possible cause	MTX
Mahlberg et al. (1)	42	M	14	Extremities	Acute lymphocytic leukaemia		Radiotherapy Chemotherapy	
Navi et al. (2)	64	M	8	Face, trunk, extremities	Hodgkin lymphoma	Yes	Chemotherapy	
Sherman et al. (3)	32	M	4	Extremities	Testicular teratoma Acute myeloid leukaemia	Yes	Radiotherapy Chemotherapy	
Diamantis et al. (4)	53	M	6	Extremities	Mantle cell lymphoma		Chemotherapy	
Nguyen et al. (5)	25	M	8	Extremities	Acute myelogenous leukaemia		Chemotherapy	
Fujii et al. (6)	66	F	19	Trunk, extremities	Chronic lymphocytic leukaemia	Yes	Radiotherapy Chemotherapy	Yes
	62	M	3	Extremities	Malignant fibrous histiocytoma	Yes	Radiotherapy Chemotherapy	
	59	M	4	Extremities	B cell lymphoma	Yes	Chemotherapy	Yes
	72	M	>5	Trunk, extremities	Diffuse large B cell lymphoma	Yes	Chemotherapy	
Deckelbaum et al (7)	42	M	30	Extremities	Testicular lymphoma		Radiotherapy Chemotherapy	
Garshik (8)	46	M	22	Extremities	Acute myeloid leukaemia	Yes	Chemotherapy	
Takahashi et al. (9)	63	F	5	Trunk, extremities	Acute myelocytic leukaemia	Yes	Chemotherapy	
Mayo et al (10)	43	M	16	Extremities	Mantle cell lymphoma	Yes	Chemotherapy	Yes
Aung et al. (11)	45	M	3	Extremities	Acute myeloid leukaemia		Chemotherapy	
Valdebran et al. (12)	32	F	17	Face, extremities	Acute promyelocytic leukaemia		Chemotherapy	
Lim et al. (13)	63	F	18	Head, trunk extremities	Breast cancer	Yes	Radiotherapy Chemotherapy	
Yoshii et al. (14)	52	M	17	Face, trunk, extremities	Systemic lupus erythematosus	Yes	Immunosuppressant	
Nguyen et al. (15)	58	M	4	Trunk, extremities	Diffuse large B cell lymphoma	Yes	Chemotherapy	
	72	M	2	Trunk, extremities	Mantle cell lymphoma		Chemotherapy	
Present case	76	F	4	Face, trunk, extremities	Rheumatoid arthritis	Yes	Immunosuppressant	Yes

MTX: methotrexate; M: male; F: female.

poromas after radiation therapy without chemotherapy were excluded from the review because the tumours in those cases developed only in the irradiated region and did not show a pedunculated appearance (not shown). The current patient had been treated with methotrexate for rheumatoid arthritis. Methotrexate is one of the chemotherapy agents (immunosuppressants) and is used for the treatment of many diseases. In addition to its well-known various adverse reactions, the drug may have a direct or indirect effect on the development of pedunculated poromas. Although we do not why drug-induced proroma shows exophytic growth, it is known that methotrexate occasionally causes acral erythema, suggesting excretion from sweat glands. An accumulation of methotrexate could be related to tumourigenesis. Since various chemotherapeutic agents were used for treatment in previously reported cases, other possible drugs could not be identified, except methotrexate. However, some chemotherapeutic agents are also concentrated in eccrine glands, which might cause multiple polypoidal poromas.

In conclusion, dermatologists must consider the possibility of drug involvement, especially methotrexate, in patients with multiple pedunculated poromas.

*The authors have no conflicts of interest to declare.*

## REFERENCES

- Mahlberg MJ, McGinnis KS, Draft KS, Fakhardzadeh SS. Multiple eccrine poromas in the setting of total body irradiation and immunosuppression. *J Am Acad Dermatol* 2006; 55: S46–S49.
- Navi D, Fung M, Lynch PJ. Poromatosis: the occurrence of multiple eccrine poromas. *Dermatol Online J* 2008; 14: 3.
- Sherman V, Reed J, Hollowood K, Littlewood T, Burge SM. Poromas and prokeratosis in a patient treated for solid-organ and haematological malignancies. *Clin Exp Dermatol* 2010; 35: e130–132.
- Diamantis ML, Richmond HM, Rady PL, Tring SK, Cutlan JE, Torres-Cabala C, et al. Detection of human papillomavirus in multiple eccrine poromas in a patient with chronic graft-vs-host disease and immunosuppression. *Arch Dermatol* 2011; 147: 120–122.
- Nguyen BT, Lortscher DN, Lee RA. Multiple poromas in a bone marrow transplant recipient: a case report. *Dermatol Online J* 2012; 18: 9.
- Fujii K, Aochi S, Takeshima C, Ohtsukka M, Hamada T, Asagoe K, et al. Eccrine poromatosis associated with polychemotherapy. *Acta Derm Venereol* 2012; 92: 687–690.
- Deckelbaum S, Toulouei K, Shibata PK, Sire DJ, Horowitz D. Eccrine poromatosis: case report and review of the literature. *Int J Dermatol* 2014; 53: 543–548.
- Garshick M. Eccrine poromatosis in a patient with acute myeloid leukemia following chemotherapy. *Dermatol Online J* 2014; 20: 11.
- Takahashi C, Nishi K, Minami-Hori M, Kishibe M, Ishida-Yamamoto A, Iizuka H. Multiple poromas following combination chemotherapy and autologous peripheral blood stem cell transplantation. *J Dermatol* 2015; 42: 430–432.
- Mayo TT, Kole L, Elewski B. Eccrine poromatosis: case report, review of the literature, and treatment. *Skin Appendage Disord* 2015; 1: 95–98.
- Aung PP, Rady PL, Nagarajan P, Ivan D, Tezlaff MT, Curry JL, et al. Detection of Merkel cell polyoma virus and beta human papillomavirus in multiple eccrine poromas in a patient with acute leukemia treated with stem cell transplant. *Am J Dermatopathol* 2017; 39: 489–491.
- Valdebran MA, Hong C, Cha J. Multiple eruptive poromas associated with chemotherapy and autologous bone marrow transplantation. *Indian Dermatol Online J* 2018; 9: 259–261.
- Lim TM, Weir J, Fearfield L. Eruptive poromatosis in a patient with breast cancer. *J Cutan Pathol* 2018; 45: 708–710.
- Yoshii Y, Matsuo S, Nishizawa A, Satoh T. Multiple eccrine poromas in a patient with systemic lupus erythematosus. *Eur J Dermatol* 2018; 28: 837.
- Nguyen K, Kim G, Chiu M. Eccrine poromatosis following chemotherapy and radiation therapy. *Dermatol Online J* 2019; 25: 11.