Squamous Cell Carcinoma Arising in Porokeratosis of Mibelli

Sun Kyo Shu, M.D., Kuk Hyeong Lee, M.D., Do Won Kim, M.D.,
Jae Bok Jun, M.D., Sang Lip Chung, M.D.

Department of Dermatology Kyungpook National University School of Medicine, Taegu, Korea

We report a case of squamous cell carcinoma arising in porokeratosis of Mibelli in a 32-year-old male who presented with a large, slowly extending, erythematous patch with central ulceration on the left lateral side of the neck.

Histopathologic examination of the periphery of the patch and central tumor showed porokeratosis and squamous cell carcinoma, respectively. **(Ann Dermatol 4:(2) 99-102, 1992)**

Key Words: Porokeratosis of Mibelli, Squamous cell carcinoma

Porokeratosis is a hereditary chronic progressive disease characterized by the formation of slightly atrophic patches surrounded by an elevated warty border[1]. Histologically it has a characteristic morphologic feature known as the cornoid lamella.

In 1893, Mibelli[2] described the classic porokeratosis as a unique dermatosis. At the same time Respighi[3] described the same disorder as hyperkeratosis eccentrica atrophicans. Thereafter, several variants of the disease have been reported.

It has a well-defined potential for malignancy. To date there have been reports of squamous cell carcinomas, basal cell carcinomas, and Bowen's diseases in porokeratosis. The incidence of malignant change was 7% in 250 cases of this disease reviewed in 1974[4].

We report a case of squamous cell carcinoma arising in porokeratosis of Mibelli.

REPORT OF A CASE

A 32-year-old man was referred to our department for evaluation of a large, slowly extending, erythematous patch of 20 years' duration on the left lateral side of the neck.

There was no history of personal or familial allergies and no significant familial dermatologic or general medical problems.

Physical examination disclosed a 10×15 cm, well-defined, circinate erythematous patch with an elevated delicate keratotic wall on the left lateral side of the neck. In the center of the patch, an elevated, ulcerated oozing tumor, measuring 2×2.5 cm, was noted (Fig. 1). Regional lymph nodes were not palpable and the remainder of physical examination was not contributory.

Legends for Figures

Fig. 1. An irregularly shaped patch, 10×15 cm in size, with ulcerated tumor in its center on the left lateral side of the neck.
Fig. 2. A skin biopsy from the peripheral ridge of the patch showing hyperkeratosis, a column of parakeratosis of the horny layer, and underlying lymphoid cell infiltration in the upper dermis (H&E, ×40).
Fig. 3. A skin biopsy from the central tumor showing irregular masses of epidermal cells that proliferate downward into the dermis (H&E, ×40).
Fig. 4. A high-power view of hyperplastic epidermal cell masses showing hyperchromasia of the nuclei, and the presence of atypical mitotic figures (H&E, ×400).
Fig. 5. Post-treatment state of the lesion after total excision and skin graft for squamous cell carcinoma and 5% 5-FU topically for porokeratosis.

Received December 5, 1991
Accepted for publication January 27, 1992
Reprint request to: Sun Kyo Suh, M.D., Department of Dermatology Kyungpook National University School of Medicine, Taegu, Korea.
This case was presented at the 7th Korea-Japan Joint Meeting of Dermatology on October 19, 1991.

Annals of Dermatology
Vol. 4, No. 2, July 1992

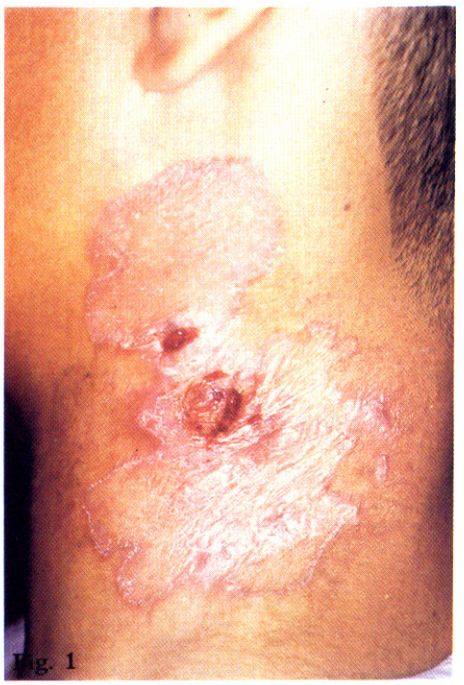


Fig. 1

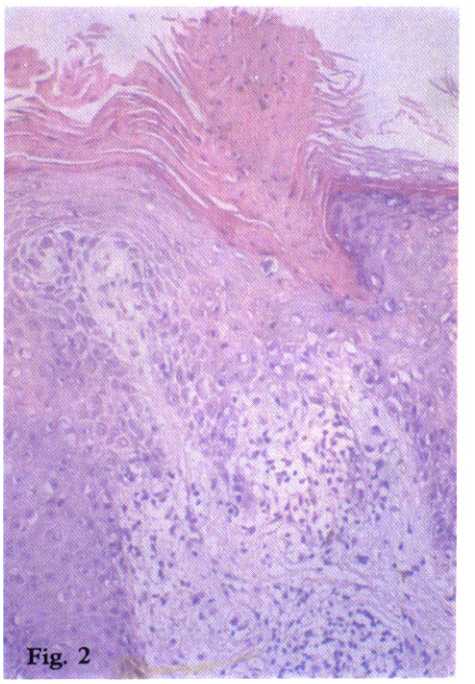


Fig. 2

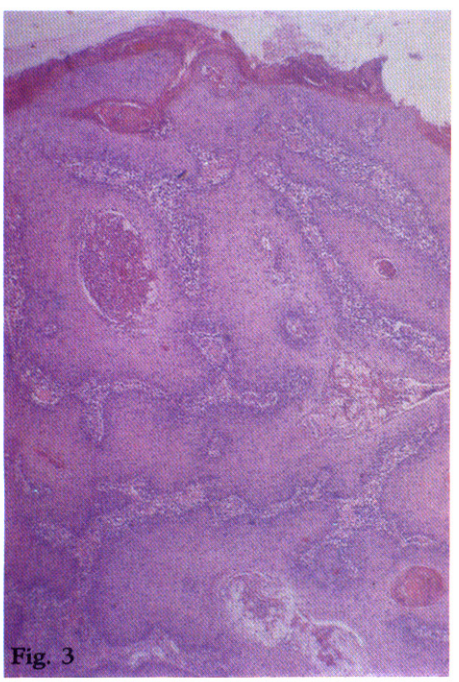


Fig. 3

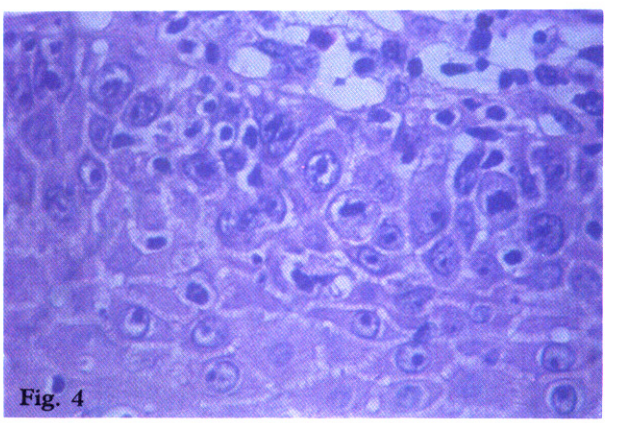
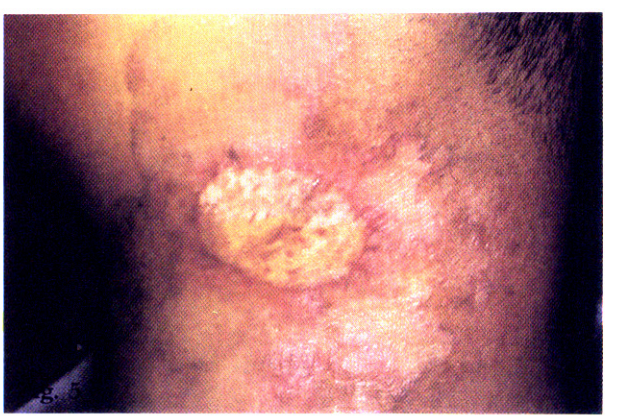


Fig. 4



The following laboratory tests were within the normal range or negative: complete blood cell count, urinalysis, VDRL, stool smear, liver function test, HB-markers, BUN/creatinine, serum electrolytes, EKG, and chest roentgenogram.

Biopsy specimens were obtained from the peripheral ridge of the patch and the central tumor. The specimen from the peripheral ridge showed marked hyperkeratosis, parakeratosis and a parakeratotic column, so-called cornoid lamella, representing the most characteristic feature of porokeratosis of Mibelli. In the epithelium beneath the parakeratotic column, epidermal cells with pyknotic nuclei and perinuclear edema were seen. The granular layer was absent (Fig. 2). Biopsy of the central tumor showed irregular masses of epidermal cells with pleomorphic and hyperchromatic nuclei that proliferated downward into the dermis (Fig. 3, 4).

Under the local anesthesia, the tumor mass was excised entirely and the raw surface was covered with full thickness skin graft. Topical 5% 5-FU for the treatment of porokeratosis for 2 months resulted in good response (Fig. 5). There was no evidence of recurrence of the squamous cell carcinoma after 1 year follow-up.

DISCUSSION

Porokeratosis is an uncommon localized disorder of keratinization inherited as an autosomal dominant trait. Lever and Schaumburg-Lever[5] described five distinct forms: (1) the plaque type, as originally described by Mibelli, (2) porokeratosis plantaris, palmaris, et disseminata, (3) disseminated superficial actinic porokeratosis, (4) the punctate form, and (5) the linear form.

On histologic examination[5], the peripheral ridge of the lesion shows a keratin-filled invagination of the epidermis. The invagination extends deeply downward and a parakeratotic column, so-called cornoid lamella, rises in the center of this keratin-filled invagination. In the epidermis beneath the parakeratotic column, the keratinocytes are irregularly arranged and possess pyknotic nuclei with perinuclear edema. No granular layer is found at the site at which the parakeratotic column arises. The dermis shows a moderate inflammatory infiltrate of lymphocytes. Our case exhibited the plaque type of porokeratosis which showed typical histopathological changes.

Various kinds of carcinoma have been reported in the porokeratosis of Mibelli since Mibelli's original description of the disease in 1893. James and Rodman[6] reviewed the literature in 1986 and found 29 patients in whom squamous cell carcinoma (21 patients), Bowen's disease (8 occurrences), or basal cell carcinoma (3 occurrences) was found within lesions of porokeratosis. The age range of the patients was from 35 to 78 years. All tumors, except for those in 3 case involving the abdomen, buttocks, and penis, developed on the limbs with a distal predilection. Most malignancies occurring were of the linear type. Compared with the observations of James and Rodman[6], our case was distinct: (1) the neoplasm developed in early thirties: (2) it was noted on the neck.

Most lesions of malignant degeneration occurring in porokeratosis were solitary and showed no metastasis. Brodkin et al.[7] reported a patient who had numerous squamous cell carcinomas arising within a porokeratotic lesion. These squamous cell carcinomas behaved in a malignant and aggressive manner, producing metastases and death. In our case, the tumor was solitary and not aggressively invasive, we found no evidence of metastasis or recurrence a year after surgery.

Cheong et al.[8] reported porokeratosis plantaris, palmaris, et disseminata associated with basal cell epithelioma in 1989 and their report is the only case of malignant degeneration occurring in porokeratosis lesion in Korea until now.

The relationship between porokeratosis and skin cancer is not clearly defined. Reed and Leone[9] have hypothesized that porokeratosis may be related to mutant clones in the epidermis. If this condition represents a clone of abnormal keratinocytes, there may be an increased susceptibility to develop cancer. Eyre and Carson[10] suggested that the linear porokeratosis of Mibelli may arise from abnormal clone cells in the developing skin of the embryo. Taylor et al.[11] cultured fibroblasts from two patients with porokeratosis associated with squamous cell carcinoma and found clones of cytogenetically abnormal cells. They concluded that chromosomal instability may be important in the induction of malignant neoplasms

when porokeratotic cells are exposed to ultraviolet light, X-rays, or trauma. Recently Gray et al.[12] suggested that the failure of keratinocytes in porokeratosis to mature and differentiate normally may be related to the increased incidence of carcinomas associated with these lesions. In our case, we were unable to identify any factor triggering the development of neoplasm. There was no history of irradiation, chronic exposure to trauma, or topical application of corrosives. However, the development of carcinoma in the patch of porokeratosis, particularly in young man, suggests that the lesion may contain clones of cytogenetically abnormal cells which promote the development of neoplasm.

Topical 5-FU application[13] or administration of etretinate[14] or isotretinoin[15] is used for the treatment for porokeratosis. There is tendency towards recurrence upon the discontinuation of the retinoid. Carbon dioxide laser ablation and excision[16] are other methods available for localized lesions. Our patient was treated with topical 5% 5-FU cream for porokeratosis with good response.

REFERENCES

1. Arnold HL, Odom RB, James WD: *Some genodermatoses. In Andrews' Diseases of the Skin. 8th ed, WB Saunders Co, Philadelphia, 1990. pp666-668.*
2. Mibelli V: *Contributo allo studio della ipercheratosi dei canali sudoriferi.G Ital Mal Ven 28:313-355, 1893. Cited from Mikhail GR, Wertheimer FW: Clinical variants of porokeratosis (Mibelli) 98:124-131, 1968.*
3. Respighi E: *Di una ipercheratosi non ancora descritta. G Ital Mal Ven 28:356-386, 1893. Cited from Mikhail GR, Wertheimer FW: Clinical variants of porokeratosis (Mibelli) 98:124-131, 1968.*
4. Goerttler EA, Jung EG: *Parakeratosis, Mibelli and skin carcinoma: a critical review. Humangenetik 26:291-296, 1975.*
5. Lever WF, Schaumburg-Lever G: *Histopathology of the Skin. 7th ed, JP Lippincott Co, Philadelphia, 1990, pp70-72.*
6. James WD, Rodman OG: *Squamous cell carcinoma arising in porokeratosis of Mibelli. Int J Dermatol 25:389-391, 1986.*
7. Brodkin RH, Rickert PR, Fuller FW et al: *Malignant disseminated porokeratosis. Arch Dermatol 123:1521-1526, 1987.*
8. Cheong HJ, Han YS, Kim SM et al: *Porokeratosis palmaris, plantaris, et disseminata associated with basal cell epithelioma. Kor J Dermatol 27:465-469, 1989.*
9. Reed RJ, Leone P: *Porokeratosis—a mutant clonal keratosis of the epidermis. Arch Dermatol 101:340-347, 1970.*
10. Eyre WG, Carson WE: *Linear porokeratosis of Mibelli. Arch Dermatol 105:426-429, 1972.*
11. Taylor AM, Harden DG, Fairburn EA: *Chromosomal instability associated with susceptibility to malignant disease in patients with porokerartosis of Mibilli. J Natl Cancer Inst 51:371-378, 1973.*
12. Gray MH, Smoller BS, McNutt NS: *Carcinogenesis in porokeratosis-evidence for role relating to chronic growth activation of keratinocytes. Am J Dermatopathol 13:438-444, 1991.*
13. Kim SR, Lee JB, Houh W: *Therapeutic efficacy of topical t-fluorouracil for zosteriform porokeratosis. Kor J Dermatol 15:63-68, 1977.*
14. Ellis CN, Voorhees JJ: *Etretinate therapy. J Am Acad Dermatol 16:267-291, 1987.*
15. McCallister RE, Estes SA, Yabrough CL: *Porokeratosis palmaris, plantaris, et disseminata. J Am Acad Dermatol 13;598-603, 1985.*
16. Barnett KJH: *Linear porokeratosis: Treatment with the carbon dioxide laser. J Am Acad Dermatol 14:902-904, 1986.*