

# Pityrosporum Folliculitis

## — Clinical and Histopathological Observation —

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Thirty-nine patients with pityrosporum folliculitis were investigated clinically and histopathologically. On clinical observation there were numerous, chronic, moderately itchy (64.1%), dome-shaped papules (89.7%) and pustules (66.7%). The most frequent sites of the lesions were the upper portion of the chest (76.9%) and back (56.4%). In biopsy specimens, abundant round and budding yeast cells were seen in a dilated hair follicle. The ruptured follicle was observed in 19 specimen (48.7%). The accumulation on inflammatory cells were observed in or around the upper part of the follicle in all specimens. The effect of antimycotic treatment was excellent. After 4 weeks of treatment, 36 patients (92%) were cured and 3 (8%) had improved significantly. KOH/Parker Ink direct smear was done in 20 patients. Blue-colored round and budding yeast cells were observed under a light microscope in all patients.

We suggest that pityrosporum folliculitis is a common disease of young and middle-aged Koreans. (*Ann Dermatol* 2:(2) 83-88 1990)

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*Key Words:* Pityrosporum folliculitis, Yeast

Pityrosporum folliculitis is a common disease of young and middle-aged persons. The disease occurs predominantly on the upper chest, back, shoulders and, less frequently, on the neck. The primary lesions are erythematous follicular papules and pustules, 2-4mm in size. The number or lesions may be variable from a few to more than 100. It is often associated with pruritus, mild to moderate in intensity.<sup>1-3</sup> Graham mentioned pityrosporum folliculitis for the first time in 1968 in discussion of Weary's presentation on "Pityrosporum ovale."<sup>4</sup> Pityrosporum folliculitis has been described frequently in English literature,<sup>1-3,5-10</sup> but has not yet been reported in Korean literature. The Pityrosporum species are inhabitants of normal-looking corneum and hair follicles.<sup>11-14</sup> In Koreans, Pityrosporum ovale (P.

ovale) was found from 33.3% to 88.2% on the normal-looking corneum and Pityrosporum orbiculare (P. orbiculare) from 37.5% to 80.8%.<sup>15</sup> As pityrosporum folliculitis resembled acne vulgaris clinically, it has sometimes been misdiagnosed and mistreated. Some authors reported that a skin biopsy was the best diagnostic procedure for making the diagnosis of pityrosporum folliculitis<sup>9,16,17</sup> and a potassium hydroxide preparation was of little help.<sup>8</sup>

The purpose of this study was to evaluate the clinical and histopathological features of Korean patient with pityrosporum folliculitis, and to estimate the usefulness of KOH/Parker Ink solution for diagnosing pityrosporum folliculitis.

## MATERIALS AND METHODS

Thirty-nine patients, 35 males and 4 females, with pityrosporum folliculitis who visited the Dermatologic Clinic of St. Mary's Hospital between September 1986 and August 1989, were included

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and clinical features and histopathologic findings were evaluated. Serial tissue sections were made from the punch biopsy specimen and were stained with hematoxylin-eosin (H & E), periodic acid-Schiff (PAS) with diastase digestion and methenamine silver nitrate. Thirty patients were treated with ketoconazole 200mg orally once daily for 4 weeks, and 9 were treated with topical 2% ketoconazole ointment twice daily for 4 weeks. The patients were assessed 2 and 4 weeks after the initial visit. Twenty patients were examined with KOH/Parker Ink solution. The contents of the follicular papule and pustule were extracted and placed on a drop of KOH/Parker Ink solution on a slide, and examined microscopically for the presence of yeast cells. The diagnosis was based on the clinical features, histopathology, the effect of antimycotic treatment, and direct smear with KOH/Parker Ink solution.

## RESULTS

**Clinical data:** The age of the patients at the time of biopsy ranged from 16 to 59 years, 35 were men and 4 were women (Table 1).

The duration of lesions prior to biopsy varied from 2 days to 10 years. Twenty-five patients (64.1%), complained of mild to moderate pruritus. Whereas in 14 patients (35.9%) the lesions were generally asymptomatic. The lesions were discrete follicular pustules (66.7%) and erythematous follicular papules (89.7%), and were 2-4mm in size (Fig. 1,2) (Table 2). Sixteen patients (41.0%) visited from March to May, and 14% patients (35.9%) from June to August (Table 3). The most frequent sites of the lesions were the upper portion of the chest (76.9%) and back (56.4%). Sometimes the lesions were found on the neck, shoulders, face, buttock, thigh, scalp, and abdomen (Table 4). Seventeen patients were consulted from other departments; 11 patients had been treated with antibiotics, 2 with chemotherapy, and 2 with hepatopathy (Table 5). Seven patients had been associated with other skin diseases; 3 with atopic dermatitis, 2 with seborrheic dermatitis, 1 with pityriasis rosea and 1 with psoriasis.

**Histopathologic findings:** Microscopic examination of multiple tissue sections from biopsy

**Table 1.** Age and sex of the 39 patients

Age (yrs)	Sex		No. of patient (%)
	M	F	
11-20	9	2	11 (28.2)
21-30	13	2	15 (38.5)
31-40	9	0	9 (23.1)
41-50	3	0	3 ( 7.7)
51-60	1	0	1 ( 2.6)

**Table 2.** Clinical features

	Clinical features	No. of patients (%)
Symptoms	Pruritus	25 (64.1)
	Asymptomatic	14 (35.9)
Signs	Papules only	13 (33.3)
	Pustules only	4 (10.3)
	Papules and pustules	22 (56.4)

**Table 3.** Seasonal variation of the first visit

Season	No. of patients (%)
Mar.-May.	16 (41.0)
Jun. -Aug.	14 (35.9)
Sep. -Nov.	6 (15.4)
Dec. -Feb.	3 ( 7.7)

**Table 4.** Sites of the lesions

Site	No. of patients (%)
Chest	30 (79.6)
Back	22 (56.4)
Neck	8 (20.5)
Shoulders	8 (20.5)
Face	3 ( 7.7)
Others	6 (15.4)

**Table 5.** Association with other medical problems

Medical problems	No. of patients (%)
Antibiotic therapy	11 (28.2)
Hepatopathy	2 (5.1)
Chemotherapy	2 (5.1)
Others	2 (5.1)
Total	17 (43.6)

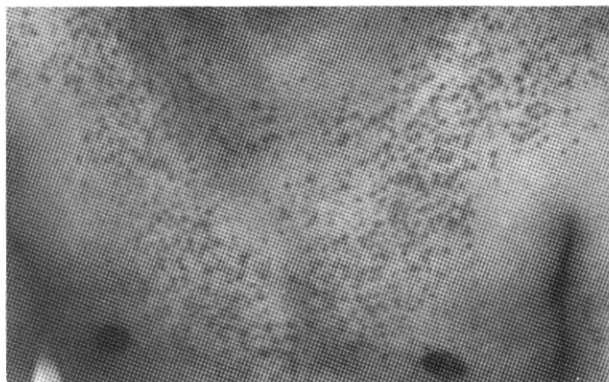
specimens consistently showed characteristic features of folliculitis (Fig. 3). Among 39 biopsy specimens, numerous round and budding yeast cells were observed in a dilated hair follicle in all speci-

**Table 6.** Histopathologic features (n=39)

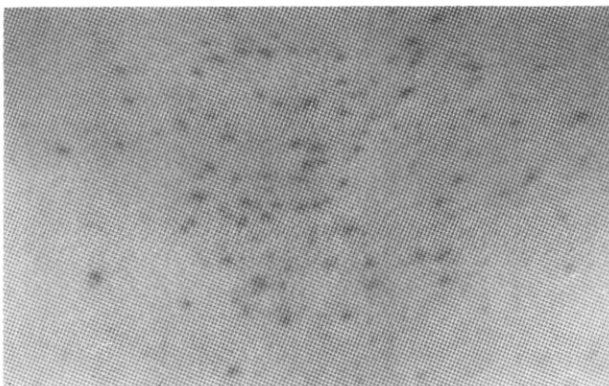
Features	No. of patients (%)
Dilated follicle	39 (100.0)
Ruptured follicle	19 (48.7)
Inflammatory cell infiltration	
Lymphocyte predominant	28 (71.8)
Neutrophil predominant	11 (28.2)
Fungi in the follicle	39 (100.0)
Fungi out of the follicle	9 (23.1)

**Table 7.** Effect of antimycotic treatment

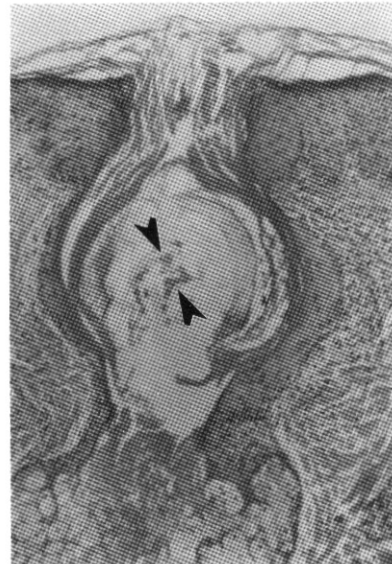
Treatment	2 Weeks		4 Weeks	
	Cured	Improved	Cured	Improved
Oral ketoconazole 200 mg/day, n=30	9	21	28	2
Topical ketoconazole 2 times/day, n=9	2	7	8	1
Total	11(28%)	28(72%)	36(92%)	3(8%)



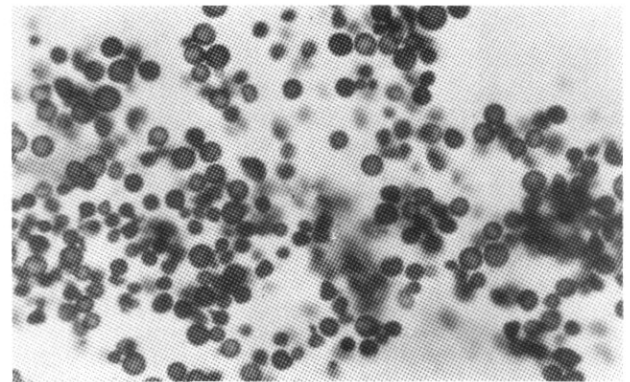
**Fig. 1.** Numerous discrete erythematous follicular papules and pustules on the anterior chest wall.



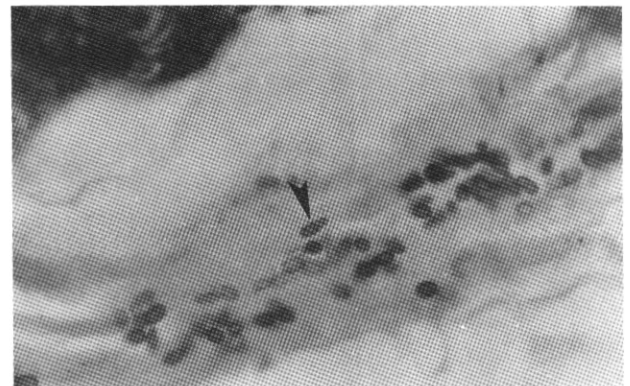
**Fig. 2.** Erythematous follicular papules and pustules on the back.



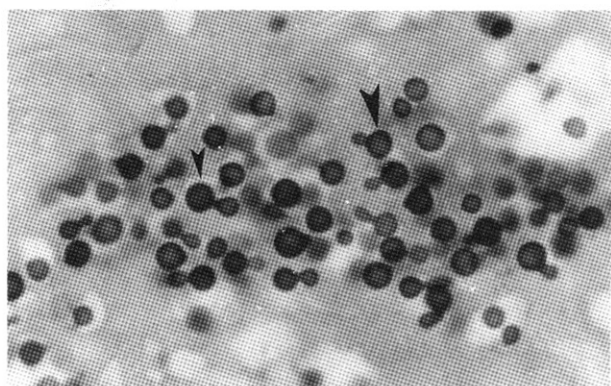
**Fig. 3.** Grouping of yeast cells (▲) in a dilated hair follicle and perfollicular inflammatory cell infiltration (H & E stain, ×100).



**Fig. 4.** Numerous round and budding yeast cells in a dilated hair follicle (PAS stain, ×1000).



**Fig. 5.** P. ovale (▲) coexisted with P. orbiculare (PAS stain, ×1000).



**Fig. 6.** Grouping of blue colored *P. orbiculare* (▲) in the keratinous materials (KOH/Parker Ink direct smear,  $\times 1000$ ).

mens (Fig. 4). The dilated follicles were often plugged, and contained keratinous material and amorphous cellular debris as well as inflammatory cells. The accumulation of inflammatory cells was observed in or around the upper part of the follicle in all specimens. The lymphocytic infiltration predominated in 28 specimens, and neutrophils in 11. *P. orbiculare* were observed in all specimens and coexisted with *P. ovale* in only one specimen (Fig. 5). Hyphal elements were not present in all specimens. The ruptured follicle was observed in 19 specimens (48.7%). Round and budding yeast cells were observed outside of the follicle in 9 specimens (23.1%) (Table 6).

**Effect of antimycotic treatment:** After 2 weeks of treatment, 11 patients (28%) were cured and 28 (72%) were improved significantly. After 4 weeks of treatment, 36 patients (92%) were cured and 3 (8%) were improved significantly (Table 7).

**Direct smear with KOH/Parker Ink solution:** Numerous round and budding yeast cells, stained with blue color, were observed in the amorphous keratinous material under the light microscope in all patients (Fig. 6).

## DISCUSSION

Pityrosporum folliculitis is a folliculitis that is caused by *P. ovale* or *P. orbiculare*. The genus *Pityrosporum* includes the species *P. ovale*, *P. orbiculare* and *Pityrosporum pachydermatis* (*P. pachydermatis*).<sup>13,18</sup> *P. ovale* and *P. orbiculare* are lipophilic and are members of the normal human cutaneous flora. *P. pachydermatis* does not

need lipids for optimal growth and it is found mainly on animals and only seldom on human skin. *P. ovale* is an oval yeast,  $2-3 \times 2-4$   $\mu\text{m}$  showing single polar budding from a wide base; *P. orbiculare* is spherical,  $2-5$   $\mu\text{m}$  in diameter and buds singly from a narrow base.<sup>18</sup> Dimorphism is not a feature of *P. ovale*, but *P. orbiculare* is capable of yeast/mycelium transformation analogous to that of *Candida* species. But, identical hyphae of *P. orbiculare* and *P. ovale* have been produced in vitro,<sup>19,20</sup> and antigenic similarities in *P. orbiculare* and *P. ovale* have been reported.<sup>21</sup> The yeast-like cells of *P. orbiculare* and hyphae of *P. ovale* represent different phases of the same organisms.<sup>13,22</sup>

*Pityrosporum folliculitis* is a common disease of young and middle-aged persons.<sup>1-3</sup> In our study, 35 of the patients (89.7%) ranged from 16 to 40 years of age. Thirty patients (76.9%) first visited our department from March to August. *Pityrosporum folliculitis* was made worse by hot humid weather.<sup>8,23</sup> *Pityrosporum folliculitis* occurs predominantly on the upper trunk.<sup>1-3</sup> The lesions were distributed on the upper portion of the chest (79.6%), back (56.4%), neck (20.5%), shoulder (20.5%) and face (7.7%) in our study. Seventeen patients (43.6%) were associated with other medical problems; 11 patients (28.2%) with antibiotic administration, 2 (5.1%) with hepatopathy, 2 (5.1%) with chemotherapy and 2 (5.1%) with other problems. Factors predisposing to the appearance of *pityrosporum folliculitis* include the administration of broad-spectrum antibiotics,<sup>4</sup> corticosteroid,<sup>24</sup> and immunocompromised patients.<sup>5-10</sup>

*Pityrosporum folliculitis* resembles acne vulgaris and has to be distinguished from it in some aspect.<sup>17,25</sup> The eruptions in *pityrosporum folliculitis* consist of follicular erythematous papules and some pustules. No comedones are observed and the itch is characteristic and sometimes intense. The eruptions are localized mainly on the trunk. Generally, the patients with *pityrosporum folliculitis* are older than patients suffering from acne vulgaris. In our study, 14 patients (35.9%) had no itching sensation, 11 patients (28.2%) ranged from 11 to 20 years of age and 3 (7.7%) had facial lesions. Therefore, it is difficult to distinguish

pityrosporum folliculitis from acne vulgaris. Pityrosporum folliculitis does not respond to an acne-type regimen, including broad-spectrum antibiotics and peeling agents, and antibiotics may precipitate or aggravate it.<sup>3,16,26</sup>

Folliculitis from Candida or steroids can easily be confused with pityrosporum folliculitis. Yohn et al. described that two of four patients skin biopsy specimens showed changes similar to steroid induced folliculitis.<sup>10</sup> However, the grouping of yeast cells was not found in steroid-induced folliculitis.<sup>24</sup>

Some authors described that the histopathologic examination was the best diagnostic procedure for making diagnosis of pityrosporum folliculitis.<sup>9,16,17</sup> A typical lesion revealed a dilated, plugged hair follicle containing keratinous material, acute and chronic inflammatory cells, and spherical to oval budding cells without hyphae.<sup>7,9</sup> These findings were consistent with our findings. Baek et al. described that the hyphae were observed in a dilated hair follicle.<sup>1</sup> Sometimes, the yeast cells were singly or in some groupings and clusters.<sup>3</sup> In our study, an accumulation of inflammatory cells was observed in or around the upper part of the follicle in all specimens. The lymphocytic infiltration predominated in 28 specimens (71.8%), and neutrophils in 11 (28.2%). No hyphae were observed in the hair follicle. According to the view of Noble and Somerville,<sup>18</sup> P. orbiculare was observed in all specimens and coexisted with P. ovale in only one specimen. The yeast cells were aggregated in the hair follicle. Serial sections might be prepared for observation of yeast cells.<sup>9,16,17</sup> The organisms were readily apparent on PAS stained or methenamine silver nitrate stained sections.<sup>7,27</sup>

All patients were treated with oral or topical ketoconazole. After 4 weeks, 36 patients (92%) were cured and 3 (8%) were improved significantly. The effect of treatment with antimycotics was often dramatic.<sup>1,2,28</sup>

Ford et al.<sup>28</sup> used Parker's stain and Sellotape for making diagnosis of 4 cases of pityrosporum folliculitis. However, they examined the skin scraping material, not the follicular extract. KOH/Parker Ink direct smear showed round and budding yeast cells, aggregated and stained with

blue color, under the light microscope in all patients. We think that KOH/Parker Ink direct smear is the easiest, most time-saving and most accurate method for making the diagnosis of pityrosporum folliculitis.

Overgrowth of P. orbiculare may stimulate scale formation at the follicular ostium, in the same fashion as it is thought to promote scale formation in tinea versicolor. In turn, this may result in occlusion of the follicular orifice and promote the formation of a pustule in the infundibular portion of the follicle.<sup>4</sup> The inflammation may be due to products released by the yeasts and also free fatty acids produced as a result of the lipase activity of the yeast.<sup>29,30</sup>

The authors suggest that pityrosporum folliculitis is a common disease of young and middle-aged Koreans.

## REFERENCES

1. Back O, Faergemann J, Hornqvist R: Pityrosporum folliculitis; A common disease of the young and middle-aged. *J Am Acad Dermatol* 12:56-61, 1985.
2. Ford G: Pityrosporum folliculitis. *Int J Dermatol* 23:320-321, 1984
3. Potter BS, Burgoon CF, Johnson WC: Pityrosporum folliculitis. *Arch Dermatol* 107:388-391, 1973.
4. Weary JJ, Russell CM, Butler HK, Hsu YT: Acneiform eruption resulting from antibiotic administration. *Arch Dermatol* 100:179-183, 1969.
5. Bufill JA, Lum LG, Caya JA, et al.: Pityrosporum folliculitis after bone marrow transplantation. *Ann Int Med* 108:560-563, 1988
6. Faergemann J, Johansson S, Back O, Scheynius A: An immunologic and cultural study of pityrosporum folliculitis. *J Am Acad Dermatol* 14:429-433, 1986.
7. Hanna JM, Johnson WT, Wyre HW: Malassezia (Pityrosporum) folliculitis occurring with granuloma annulare and alopecia areata. *Arch Dermatol* 119:869-871, 1983.
8. Jillson OF: Pityrosporum folliculitis. *Cutis* 35:226-227, 1985.
9. Klotz SA, Drutz DJ, Huppert M, Johnson JE: Pityrosporum folliculitis Its potential for confusion with skin lesions of systemic candidiasis. *Arch Intern med* 142:2126-2129, 1982.
10. Yohn JJ, Luska J, Camisa C: Malassezia folliculitis in immunocompromised patients. *Cutis* 35:536-538, 1985.
11. Gordon MA: Lipophilic yeast-like organisms associated with tinea versicolor. *J Invest Dermatol* 17:267-272, 1951.
12. Faergemann J: Quantitative culture of Pityrosporum orbiculare. *Int J Dermatol* 23:330-333, 1984.
13. Faergemann J, Bernander S: Tinea versicolor and Pityrosporum orbiculare: A mycological investigation. *Sabouraudia* 17:171-179, 1979.
14. McGinley KJ, Leyden JJ, Marples RR, Kligman AM: Quantitative microbiology of the scalp in non-dandruff, dandruff.

- and seborrheic dermatitis. *J Invest Dermatol* 64:401-405, 1975.
15. Chin HS, Han SW: The incidence of *Pityrosporum orbiculare* and *Pityrosporum ovale* on normal skin. *Kor J Dermatol* 20:631-639, 1982.
  16. Goodfield MJD, Saihan EM: Failure of isotretinoin therapy in *pityrosporum folliculitis*. *J Am Acad Dermatol* 18:143-144, 1988.
  17. Berretty PJM, Neumann HAM, Hulsebosch HJ: *Pityrosporum folliculitis*: Is it a real entity? *Br J Dermatol* 103:565-566, 1980.
  18. Noble WC, Somerville DA: *Microbiology of Human Skin*. New York, WB Saunder Co, 1974, pp 206-210.
  19. Porro MN, Passi S, Caprilli F, Mercantini R: Induction of hyphae in culture of *Pityrosporum* by cholesterol and cholesterol esters. *J Invest Dermatol* 69:531-534.
  20. Piamphongsant T: *Pityriasis pigmentosa*: The clinical features of pathogenic *Pityrosporum ovale*. *J Dermatol* 10:355-360, 1983.
  21. Tanaka M, Imamura S: Immunological studies on *Pityrosporum* genus and *Malassezia furfur*. *J Invest Dermatol* 73:321-324, 1979.
  22. Faergemann J, Tjernlund U, Scheynius A, Bernander S: Antigenic similarities and difference in genus *Pityrosporum*. *J Invest Dermatol* 78:28-31, 1982.
  23. Hjorth N, Sjolín KE, Sylvest B, Thomsen K: *Acne aestivalis-Mallorca acne*. *Acta Derm Venereol (Stockh)* 52:61-63, 1972.
  24. Kaidbey KH, Kligman AM: The pathogenesis of topical acne. *J Invest Dermatol* 62:31-36, 1974.
  25. Heymann WR, Wolf DJ: *Malassezia (Pityrosporon) folliculitis* occurring during pregnancy. *Int J Dermatol* 25:49-51, 1986.
  26. Friedman SJ: *Pityrosporum folliculitis*: Treatment with isotretinoin. *J Am Acad Dermatol* 16:632-633, 1987.
  27. Faergemann J, Maibach HI: The *Pityrosporon* yeasts: Their role as pathogens. *Int J Dermatol* 23:463-465, 1984.
  28. Ford G, Ive FA, Midgley G: *Pityrosporum folliculitis* and ketoconazole. *Br J Dermatol* 107:691-695, 1982.
  29. Marples RR, Downing DT, Kligman AM: Influence of *Pityrosporum* species in the generation of free fatty acids in human surface lipids. *J Invest Dermatol* 58:155-159, 1972.
  30. Porro MN, Passi S, Caprilli F, Nazzaro P, Morpurgo G: Growth requirements and lipid metabolism of *Pityrosporum orbiculare*. *J Invest Dermatol* 66:178-182, 1976.