shorter than pressure ulcer and all ulcers with SGD patients were healed completely. As elderly people gradually increase worldwide, it is important that these ulcers should be recognized in SGD patients and distinguished from pressure ulcer.

In conclusion, the ulcers developed with SGD are thought to be produced by mainly friction more than pressure force in elderly peoples, and their locations different from that of pressure ulcers. And it is important to notice that these SGD ulcers have relatively shorter duration and better response of treatment than that of pressure ulcers, so it is necessary to avoid excessive treatment.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

REFERENCES

1. Yamamoto T, Mukai H. Hyperkeratotic lichenified skin lesion of gluteal region. *Nishinihon J Dermatol* 1979;41:798.
2. Liu HN, Wang WJ, Chen CC, Lee DD, Chang YT. Senile gluteal dermatosis-a clinicopathologic study of 12 cases and its distinction from anosacral amyloidosis. *J Eur Acad Dermatol Venereol* 2012;26:258-260.
3. Niiyama S, Sakurai S, Katsuoka K. Hyperkeratotic lichenified skin lesion of gluteal region. *J Dermatol* 2006;33:779-782.
4. Liu HN, Wang WJ, Chen CC, Lee DD, Chang YT. Senile gluteal dermatosis: a clinical study of 137 cases. *Int J Dermatol* 2014;53:51-55.
5. Powers JG, Odo L, Philips TJ. Decubitus (pressure) ulcers. In: Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Leffell DJ, Wolff K, editors. *Fitzpatrick's dermatology in general medicine*. 8th ed. New York: McGraw-Hill, 2012:1121-1129.
1. Yamamoto T, Mukai H. Hyperkeratotic lichenified skin

<https://doi.org/10.5021/ad.2017.29.6.801>

Novel *KIT* Missense Mutation P665S in a Chinese Piebaldism Family

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Dear Editor:

Piebaldism (OMIM #172800) is a rare autosomal dominant disorder characterized by stable areas of amelanotic skin and a white forelock. Piebaldism is thought to result from defective proliferation or migration of melanocytes

from the neural crest during development¹. According to the depigmented patches, piebaldism can be presented in mild, moderate and severe conditions. The mild type may only show a white forelock or smaller leukoderma on the ventral trunk and/or an extremity without a white

Received July 27, 2016, Revised October 10, 2016, Accepted for publication October 31, 2016

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Fig. 1. (A~C) The skin lesions of the proband. (D) Pedigree of the Chinese family in this study.

Fig. 2. Chromas diagrams of this family. The upper one: the proband and her father's. The lower one: her mother and brother's.

forelock. The severe form shows a typical white forelock on frontal scalp and relatively large leukoderma on the chest, abdomen, and extremities. The moderate phenotype is the intermediate type of these two forms². Missense and frameshift mutations of the *KIT* gene are responsible for a range of phenotypes with piebaldism.

We collected one Chinese family with piebaldism. The proband, a 16-year-old girl, born with a white forelock, irregular 1 ~ 5 cm-sized white patches on her abdomen and multiple large areas of white patches asymmetrically scattered over both knees with intrapatch freckling (Fig. 1A ~ C). Her father showed similar lesions. The other members of this family were normal. Based on clinical phenotype classification of piebaldism, a severe form of piebaldism was defined.

The family members voluntarily joined the genetic screening after informed consents were obtained. All exons, exon-intron flanking regions of *KIT* gene were analyzed by polymerase chain reaction and Sanger sequencing. A novel heterozygous missense variant (c.1993C>T, p.P665S) of *KIT* gene was identified from the proband and her father (Fig. 2). This mutation was absent in her mother and brother and 100 unrelated healthy people as well. By PolyPhen-2, this mutation was predicted to be probably damaging with a score of 0.999 (sensitivity: 0.09, specificity: 0.99). All of these results supported that this mutation probably had pathogenic significance.

Generally, loss of functional mutations of *KIT* gene is responsible for almost all cases of piebaldism. The cytoplasmic region of KIT contains a juxtamembrane domain and a TK (tyrosine kinase) domain that is subdivided into a TK domain 1 (TK1), a kinase insert domain and a TK domain 2 (TK2)². The severe phenotypes of piebaldism usually result from mutations involving the intracellular tyrosine domain, whereas the mild phenotypes are usually caused by mutations involving the amino-terminal extracellular ligand binding domain³. Wasag et al.⁴ demonstrated that one mutation (p.T619A) in the TK1 domain led to much weaker phosphorylation level of KIT protein than wild type KIT. In addition, one mutation (p.G664R) was demonstrated to cause severe phenotype of piebaldism⁵. As

the novel mutation (p.P665S) is in the TK1 region and adjacent to the above missense mutation, we infer that this mutation (p.P665S) may probably affect the autophosphorylation of KIT and thus result in significantly decreased proliferation and migration of melanocytes in the lesions.

In summary, a novel missense mutation (p.P665S) in TK1 region of KIT was reported in a Chinese family with severe piebaldism. Mutations in cytoplasmic TK region are mostly associated with severe phenotypes; however, the pathogenicity of this variant remains to be fully elucidated.

ACKNOWLEDGMENT

A grant from National Natural Science Foundation of China (81371724) to Yanhua Liang.

All persons who have made substantial contribution, but who are not eligible as authors are named in acknowledgment.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

REFERENCES

1. Spritz RA, Holmes SA, Ramesar R, Greenberg J, Curtis D, Beighton P. Mutations of the KIT (mast/stem cell growth factor receptor) proto-oncogene account for a continuous range of phenotypes in human piebaldism. *Am J Hum Genet* 1992;51:1058-1065.
2. Oiso N, Fukai K, Kawada A, Suzuki T. Piebaldism. *J Dermatol* 2013;40:330-335.
3. Lennartsson J, Rönnstrand L. Stem cell factor receptor/c-Kit: from basic science to clinical implications. *Physiol Rev* 2012;92:1619-1649.
4. Wasag B, Chmara M, Legius E. Molecular characterization of two novel KIT mutations in patients with piebaldism. *J Dermatol Sci* 2012;66:78-79.
5. Giebel LB, Spritz RA. Mutation of the KIT (mast/stem cell growth factor receptor) protooncogene in human piebaldism. *Proc Natl Acad Sci U S A* 1991;88:8696-8699.