

A Sterile Pyogranuloma/Granuloma Syndrome (SPGS) in a Rottweiler Dog

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Abstract : A 5-year-old Rottweiler neutered female dog was presented with signs of mandibular and popliteal lymphadenopathy, erosion in mucocutaneous junction of muzzle and lips, multiple papules and nodules in right rear limb and neck, and alopecia in right thorax. There was no further clinical sign except anorexia, sporadic fever and ocular hyperemia. She hadn't shown any response to carprofen prescribed by local veterinarian. Hematological abnormalities included mild anemia and severe lymphocytosis. On serum biochemical profile, only elevated AST level was noticed. On cytological examination, there was an evidence of mild bacterial infection which seemed to occur secondarily. Three sites were biopsied that included muzzle, upper lip and right thoracic region. Histopathologically, multifocal confluent pyogranulomatous dermatitis, scattered granulomatous inflammation in subcutis and severe septal panniculitis were observed. Special stainings (Gram, Acid-fast, PAS, Giemsa) were performed to reveal that a dog was negative for any organism. Finally, sterile pyogranuloma/granuloma syndrome (SPGS) was diagnosed. The treatment was initiated with prednisolone and enrofloxacin. The condition was successfully resolved after 4 weeks of treatment. This good response suggests that SPGS may be immune-mediated disease of its pathogenesis and this drug combination may be a viable therapeutic option for dogs suffering from SPGS. Also, this article reports a case of SPGS in Rottweiler for the first time.

Key words : sterile pyogranuloma/granuloma syndrome (SPGS), dog, glucocorticoid

Introduction

Sterile pyogranuloma/granuloma syndrome (SPGS) has been described in the dog. Though exact pathogenesis is not known, an immune-mediated pathogenesis may be involved, since affected animals respond to systemic immunomodulating agents (e.g. glucocorticoids, azathioprine, L-asparaginase)^{4,8,10,12}. The lesions are usually multiple, consisting of nonpruritic, nonpainful papules, plaques and nodules^{11,12}. Distribution of the lesions is most commonly found on the head. No specific systemic signs are associated with the syndrome¹⁰. Lymphadenopathy has been reported in 31% of the cases¹⁰. Characteristic histopathological findings are perifollicular, vertically oriented, "sausage-shaped" granulomas or pyogranulomas⁸. The syndrome frequently takes a waxing and waning course¹². As we known as, this is the first documented case of SPGS in Rottweiler.

CASE REPORT

A 5-year-old, neutered female Rottweiler was presented to local animal hospital with papulonodular symptoms of about 2 months' duration. There were symptoms of anorexia, fever and ocular hyperemia as well. The dermatological disease began with the swelling of the bilateral cervical and popliteal lymph nodes. Initially, the referring veterinarian had prescribed cephalexin and carprofen (Rimadyl, Pfizer Co., Ltd).

The lymph nodes didn't respond to therapy, therefore local veterinarian changed the type of antibiotic to tetracycline. Though tetracycline made lymph nodes reduced somewhat in size, other skin lesions still remained, so this dog was referred to Veterinary Medical Teaching Hospital of Kyungpook National University.

On presentation, the dog had bilateral mandibular and popliteal lymphadenopathy and lytic change of mucocutaneous junction (Fig 1). The lesions were firm, circular, but they were neither painful nor pruritic. Alopecia seemed to be initiated over the right thorax and getting worse as time went by. On the right rear limb and neck, many papules, plaques and nodules existed (Fig 2). But the patient didn't seem to feel pain on them. There were no further clinical signs except anorexia and fever (40.2).

Routine laboratory analyses and biopsies of the lesions (right muzzle, upper lip and skin of thorax) were submitted. On hematology, mild non-regenerative anemia, severe lymphocytosis and moderate monocytosis were observed. Results of serum chemistry were within normal limits but moderately increased AST. For cytological examination, fine needle aspiration of popliteal and mandibular lymph node was performed, and showed many phagocytized cell debris, large lymphocytes and some neutrophils. There was an evidence of secondary bacterial infection showing some of cocci on skin cytology.

So prednisolone 0.5 mg/kg body weight PO q24hr and enrofloxacin (Baytril, Bayer Co., Ltd) 5 mg/kg PO q24hr were prescribed. Cimetidine was also given for protectant. Histopathological results of the biopsies were presented (Fig 3, 4).

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Fig 1. Dermatologic lesion - diffuse erosion on mucocutaneous junction, especially muzzle.



Fig 2. Dermatologic lesion - papulonodular symptoms with annular and erythematous plaques over back.

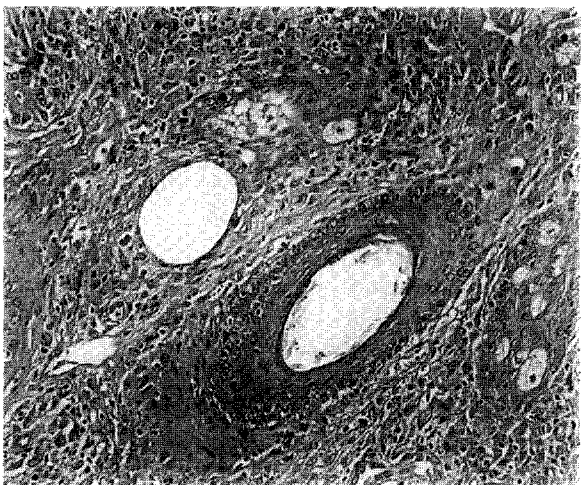


Fig 3. Intradermal pyogranulomatous foci and leukocytes in dermis.

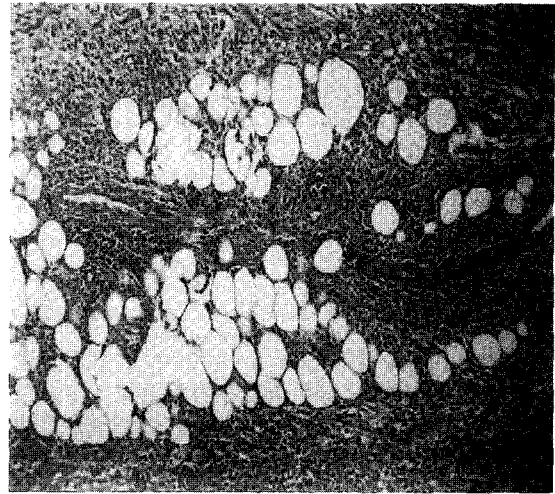


Fig 4. Septal panniculitis; Lots of large phagocytes and a few neutrophils - A lot of lymphocytes, plasma cells and large phagocytes between lipid cells.

The biopsy specimens from muzzle and lip were characterized as multifocal confluent pyogranulomatous dermatitis distributed in the area of hair follicles, muscle layer, adjacent sweat gland and subcutis, and severe epidermal hyperplasia and hypertrophy with focal ulceration. And the skin section of thorax was observed as scattered granulomatous inflammation in subcutis and severe septal panniculitis with perivascular orientation. There was no organism to be seen on samples. In special stains (i.e. Brown and Brenn gram [B+B], periodic acid-Schiff [PAS], Ziehl-Neelsen [ZN] acid-fast and Giemsa), all sections were negative for any organism. Finally, the definitive diagnosis could be done by sterile pyogranuloma/granuloma syndrome (SPGS) with this patient.

The dog was rechecked in two weeks. Popliteal and mandibular lymph nodes were reduced by half in size. Other skin lesions on the face, ear margin, submandibular, trunk and rear limb were still remaining during the first week of treatment, but they were becoming resolved during second week. She was still suffering from inappetence, but her temperature was in normal range. We decided to prescribe prednisolone 3 mg/kg PO q24hr, enrofloxacin (Baytril, Bayer Co., Ltd) 5 mg/kg PO q24hr and cimetidine 10 mg/kg PO q24hr for another 2 weeks. The dog was recommended to be rechecked in one week. And we also considered using azathioprine if there's no favorable response or adverse effect with prednisolone.

When the dog came here for the recheck in a week, most of papules and nodules of the skin were reduced or almost gone. Lymph nodes were decreased in size. Cytologically, bacterial infection seemed to be resolved. Her temperature and appetite were also normal. Since there was not any evidence of adverse effect with prednisolone, we decided to control the dog another one week with this drug combination and recommended to recheck in one week.

One week later, the owner reported that the dog appeared

to be responded with this drug very well. Her skin lesions were seemed to be almost resolved and rarely have some evidence of bacterial infection or lymphadenopathy. While we told adverse effect of prednisolone that could appear later, the owner wanted to stop treating her with this drug since her skin problem seemed to be almost gone. So we stopped the medication and described the possibility of recurrence with this disease to the owner. A week later, we called the owner for the recheck of dog's condition. The owner said that there's no evidence of recurrence and her condition was very good. The owner was not treating the dog with any specific drug, but sometimes applying hydrogen peroxide topically on remaining skin lesion. The owner was also recommended to come to hospital when the dog would become having symptoms of recurrence in a future.

Discussion

Granulomatous dermatitis in dogs is associated with infectious agents (e.g. fungi, algae, bacteria, protozoa and parasites), noninfectious causes (e.g. foreign bodies) and idiopathy^{6,10,12}. Idiopathic sterile pyogranuloma/granuloma syndrome describes lesions of unknown etiology and pathogenesis that occur uncommonly in the dog, and few cases were reported^{9,11}. The condition is idiopathic, but the histiocytic inflammatory response to glucocorticoid therapy suggests an immune dysfunction^{10,12,17}. Breeds reported to be predisposed are Great Dane, Golden retriever, Boxer, English bulldog and Dachshund^{5,8,10,12,17} but any breed can be affected. To our best knowledge this is the first case report of SPGS in Rottweiler, meaning this breed can possibly predisposed in SPGS. There's no age or sex predilection with this disease^{5,12}.

Skin lesions are mostly multiple and frequently found on the head, especially the muzzle, and distal extremities¹⁰. Though lesions sometimes regress spontaneously, others can be waxing and waning course¹². Dogs with SPGS are usually healthy and routine laboratory examinations are not remarkable¹². Regional lymphadenopathy with histopathological evidence of granulomatous lymphadenitis has been documented in 31% of the cases reported¹⁰ and was also present in this case.

Definitive diagnosis of SPGS is very difficult because of its unknown etiology and pathogenesis. And veterinarian should rule out all possible causes of granulomas. In most cases, vertically oriented, elongated perifollicular granulomas or pyogranulomas that track hair follicles are seen on biopsy specimens^{8,12}. Though cultures were not performed, histopathological findings and the results of special staining were consistent with this disease, and any infectious organism wasn't found on biopsy specimens.

There were some reports that revealed good response with tetracycline and niacinamide which has been used for immune-mediated dermatoses, initially induced with glucocorticoids^{1,3,16}. Prednisolone and enrofloxacin (Baytril), which was prescribed for secondary skin infection and prophylaxis,

appeared to be effective in this case, with clinical signs having resolved within about one month. In human sarcoidosis which has similar clinical pattern of SPGS, there's some referable therapeutic options for treating granulomatous syndrome in dogs^{5,14,18}. Those are tetracycline with triamcinolone, thalidomide, topical tacrolimus, IFN therapy, TNF- α inhibitor and surgical excision with prolonged antimicrobial therapy^{5,8,14,16-18}. Not having told the formal therapy for SPGS yet, many therapeutic options for treating SPGS patients can be discussed.

Conclusion

A 5-year-old Rottweiler dog having dermatologic signs of papulonodular symptoms in right rear limb and neck, and lytic change in muzzle and lip. Definitive diagnosis was made by histopathological findings. The dog had been treated with prednisolone and enrofloxacin which have shown good response. More drugs can be considered for this disease comparing to human sarcoidosis which has similar clinical pattern with SPGS. This was the case of SPGS reported in Rottweiler for the first time.

References

1. Carlotti DN. Cutaneous and subcutaneous lumps, bumps, and masses. In: Textbook of Veterinary Internal Medicine, 5th ed. Philadelphia: WB Saunders. 1999: 36-39.
2. Carpenter JL, Thornton GW, Moore FH, King NW Jr. Idiopathic periadnexal multinodular granulomatous dermatitis in dogs. *Vet Pathol* 1987; 24: 5-10.
3. Claffins ML, Collins D, Fiveson DP. Treatment of pemphigus and linear IgA. dermatosis with nicotinamide and tetracycline: a review of 13 cases. *J Am Acad Dermatol* 1993; 28: 998-1000.
4. Collins BK, MacEwen EG, Dubielzig RR. Idiopathic granulomatous disease with ocular adnexal and cutaneous involvement in a dog. *J Am Vet Med Assoc* 1992; 201: 313-324.
5. Dennis WC. Idiopathic sterile granuloma and pyogranuloma syndrome. In: Small animal dermatology secrets, Hanley & Belfus, 2004: 227-230.
6. Fadok VA. Granulomatous dermatitis in dogs and cats. *Sem Vet Med Surg (Sm Anim)* 1987; 2: 186-194.
7. George PR, Paul JC. Diagnostic cytology of skin lesions. In: Textbook of Veterinary Internal Medicine, 5th ed. Philadelphia: WB Saunders. 1999: 51-55.
8. Gross TL, Ihrke PJ, Walder EJ. Veterinary dermatopathology. A macroscopic and microscopic evaluation of canine and feline skin disease. St. Louis: Mosby-Year Book. 1992: 194-197.
9. Houston DM, Clark EG, Matwichuck CL, Teachout DJ. A case of cutaneous sterile pyogranuloma/granuloma syndrome in a golden retriever. *Can Vet J* 1993; 34: 121-122.
10. Panich R, Scott DW, Miller WH. Canine cutaneous sterile pyogranuloma/granuloma syndrome: A retrospective analysis of 29 cases (1976-1988). *J Am Anim Hosp Assoc* 1991; 272: 519-528.

11. Rothstein E, Scott DW, Riis RC. Tetracycline and niacinamide for the treatment of sterile pyogranuloma/granuloma syndrome in a dog. *J Am Anim Hosp Assoc* 1997; 33: 540-543.
12. Scott DW, Miller WH, Griffin CE. *Small animal dermatology*. 6th ed. Philadelphia: WB Saunders, 2000: 1136-1140.
13. Scott DW, Buerger RG, Miller WH. Idiopathic sterile granulomatous and pyogranulomatous dermatitis in cats. *Vet Dermatol* 1990; 1: 129-135.
14. Sharma OP. Sarcoidosis of the skin. In: *Fitzpatrick's dermatology in general medicine*, 5th ed. New York: McGraw-Hill, 1999: 2099-2106.
15. Torres SM. Sterile nodular dermatitis in dogs. *Vet Clin North Am Small Animal Pract* 1999; 29: 1311-1323.
16. White SD, Rosychuck RAW, Reinke IS, Paradis M. Use of tetracycline and niacinamide for treatment of autoimmune skin disease in 31 dogs. *J Am Vet Med Assoc* 1992; 200: 1497-1500.
17. Yager JA, Wilcock BP. Color atlas and text of surgical pathology of the dog and cat. In: *Dermatopathology and skin tumors*. London: Mosby-Year Book Europe, 1994: 119-154.
18. Yen TN, Alain D, Florence C. Treatment of cutaneous sarcoidosis with thalidomide. *J Am Acad Derm* 2004; 50: 235-241.

Rottweiler에서 발생한 무균성 농성 육아종성/육아종성 피부증후군(SPGS)

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요 약 : 5년령의 암컷 Rottweiler가 하악 및 슬와림프절의 비대, 입주변부의 미란성 피부병변과 우측 후지와 경부에 다수의 구진과 결절의 증상으로 내원하였다. 식육부진을 제외하고는 전신적으로 특이한 증상은 없었으며, 개인 동물병원에서 cephalexin과 carprofen을 처치하였으나 호전을 보이지 않았다. 혈액검사 결과, 미약한 빈혈과 심한 림프세포 증다증을 보였으며, 생화학적검사에서는 AST수치가 증가한 것을 제외하고는 모두 정상이었다. 피부 세포학적 검사에서 세균이 소수 관찰되었다. 피부조직병리학 검사에서 다발성의 농성육아종성 병변과 미란성 지방염의 특징이 관찰되었다. 특수염색으로 Brown and Brenn gram [B+B], periodic acid-Schiff [PAS], Ziehl-Neelsen [ZN] acid-fast, Giemsa 염색을 실시하였으나 원인체를 발견하지 못했다. 따라서 무균성 농성 육아종성/육아종성 피부증후군으로 진단하였고 enrofloxacin과 prednisolone의 병용투여에 양호한 치료반응을 보였다. Rottweiler에서 발생한 나타난 SPGS를 최초로 증례보고한다.

주요어 : sterile pyogranulomatous/granulomatous syndrome(SPGS), dog, glucocorticoid.