

## Multiple perianal infundibular follicular cysts in a dog

Jin-Kyu Park\*, Il-Hwa Hong\*, Mi-Ran Ki\*,  
Kyung-Sook Hong\*, Ae-Ri Ji\*, Sun-Hee Do<sup>†</sup>  
and Kyu-Shik Jeong\*

\*College of Veterinary Medicine, Kyungpook National University,  
Daegu 702-701, South Korea

<sup>†</sup>College of Veterinary Medicine, Konkuk University, Seoul 143-701,  
South Korea

Correspondence: Kyu-Shik Jeong, College of Veterinary Medicine,  
Kyungpook National University, Daegu 702-701, South Korea.

E-mail: jeongks@knu.ac.kr

### Source of Funding

This research was supported by a grant (A081039) from Health and  
Medical Technology R&D program, Health and Korean Health Indus-  
try Development Institute in Republic of Korea.

### Conflict of Interest

No conflicts of interest have been declared.

### Abstract

**This case report describes a 7-year-old male cocker spaniel dog with multiple perianal infundibular follicular cysts. Clinically the dog had moderate anal sacculitis, peri-anal pruritus causing it to 'scoot' and lick the area. On examination of the perianal area, there were over 100 firm, well circumscribed papules, ranged from 0.2 to 0.5 cm in diameter with a central pore, and were found in the perianal region. Alopecia was present in the perianal region. The skin tissue in the perianal region resected surgically was submitted for histological examination. Microscopically, the tissue revealed multiple dilated cysts filled with keratins and the papules corresponded to infundibular follicular cysts. The affected dog showed moderate anal sacculitis. Anal sacculitis commonly causes repeated scooting or licking the area around the anus. Therefore, the multiple follicular cysts in the present case appear to be primarily a sequela to chronic external trauma to the perianal area, probably in response to anal sacculitis. To the best of the authors' knowledge, the present report is the first documented case of multiple perianal infundibular follicular cysts in a dog.**

Accepted 13 May 2009

Cutaneous follicular cysts are common in dogs and several breeds of sheep.<sup>1</sup> The classification of cutaneous cysts depends on the identification of the epithelial lining in which the cyst arises.<sup>2</sup> Cutaneous cysts can be classified as dermoid cysts, follicular cysts and epidermal cysts.<sup>3</sup> Epidermal cysts occur as a result of traumatic embedding of epidermal fragments or a congenital anomaly of epidermal development and with respect to the latter, are very rare.<sup>2</sup> The majority of cutaneous cysts

found in dogs are follicular cysts.<sup>2</sup> The authors describe a case of multiple perianal infundibular follicular cysts in a dog. A 7-year-old male cocker spaniel dog was presented by a dog breeder to a local veterinary hospital for the problem of multiple perianal papules. The breeder reported not having seen this problem before and reported the lesions to have started approximately 1 month prior to presentation. None of the other dogs in the breeding kennel were affected. Except for the skin, the dog was in good health and physical examination was unremarkable. Upon examination, more than 100 papules, ranging in diameter from 0.1 to 0.5 cm (Figure 1), were found in the perianal region. The lesions were firm, well circumscribed and present in only the perianal region. Several papules contained a central pore filled with brownish contents, whereas others showed no central pore. The only other finding was a moderate case of anal sacculitis. A complete blood count and serum blood chemistry analysis were within normal laboratory ranges.

The dog was scheduled for surgical resection of the tissue and under general anaesthesia, the abnormal perianal tissue and the anal sacs were excised surgically. The excised perianal tissue was referred to the Department of Veterinary Pathology, Kyungpook National University for histopathological examination. On cut section, the tissue exhibited multiple masses of friable grey-brown material within the dermis (Figure 2). Microscopically, the tissue showed multiple dilated cysts filled with laminated eosinophilic keratin or amorphous keratin flakes. Hair fragments were absent in the cysts. Some cysts had a pore connected to the skin surface. The interface between the cyst wall and surrounding epidermis was smooth (Figure 3). The lining was composed of stratified squamous epithelium with a distinct granular cell layer (Figure 4). There were no sebaceous glands or sweat glands radiating from the cyst wall. However, some cysts exhibited sebaceous gland lobules and sweat glands attached to the deepest region of the cyst. Mild infiltrations of inflammatory cells, including lymphocytes, plasma cells and histiocytes around the cysts, were also observed. All cysts revealed the same histological morphology as described above. Based on the history, clinical signs and histological examination was multiple perianal infundibular follicular cysts.

Clinical management of small numbers of individual cutaneous follicular cysts is surgical excision or observation without treatment.<sup>3</sup> Because the number of follicular cysts in this case was so large and involved so much skin, individual excision was not possible and the entire affected perianal skin was completely resected. Eight months after surgical excision of the cysts, the dog was in good health with no recurrence of the follicular cysts and scooting.

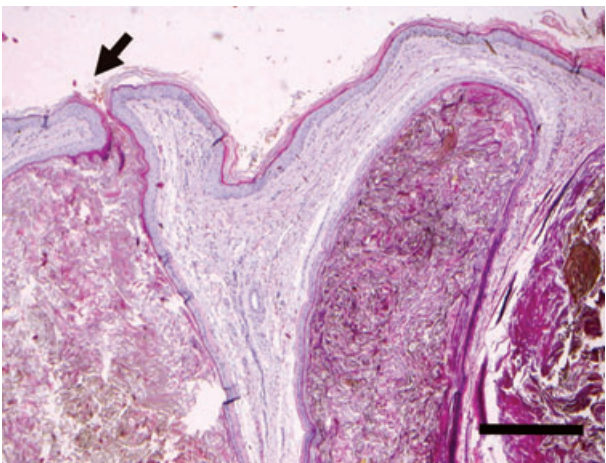
Cutaneous cysts can be classified into three types based on the histological findings; epidermal cysts,



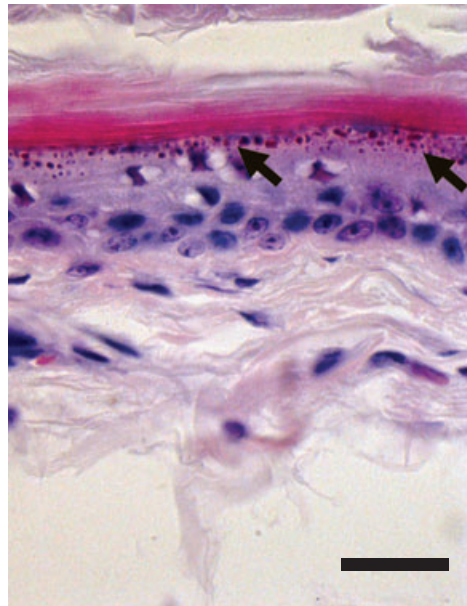
**Figure 1.** Surgically resected perianal region fixed with formalin showing more than 100 papules ranging from 0.1 to 0.5 cm.



**Figure 2.** The cut surface of the surgically resected perianal region reveals multiple masses of friable grey-brown material (arrow) within the dermis.



**Figure 3.** Multiple cysts filled with laminated eosinophilic keratin or amorphous keratin flakes. Note the narrow pore (arrow) connecting one cyst to the skin surface. A mild inflammatory infiltrate can be seen in the dermis between the cysts. H&E, Bar = 500  $\mu$ m.



**Figure 4.** The lining was composed of stratified squamous epithelium with a distinct granular layer (arrow) and without adnexal structures. H&E, Bar = 20  $\mu$ m.

dermoid cysts and follicular cysts.<sup>3</sup> Epidermal, dermoid and follicular cysts are very similar clinically in that they are well circumscribed cysts within dermis, have no age, breed, sex predilections and may be due to congenital abnormalities or are acquired because of secondary factors.<sup>3-5</sup> Epidermal and follicular cysts can occur in any anatomical location, whereas dermoid cysts usually occur as single or multiple sinuses along the dorsal midline of the neck and sacrum.<sup>3,5</sup> True epidermal cysts, which are a result of traumatic embedding of epidermal fragments, are characterized histologically by keratinization via a granular cell layer and no adnexal structures attached to the epithelial lining. Follicular cysts are characterized by an epithelial lining that may have a granular cell layer or may undergo abrupt keratinization; sebaceous glands or epitrichial sweat glands are sometimes attached to the base of the cyst.<sup>3,5</sup> Dermoid cysts, which result from a congenital infolding of ectoderm, are lined by epidermal-type epithelium, keratinize via a granular cell layer, and usually have hair follicles, sebaceous glands, and epitrichial sweat glands attached at various points around the cyst wall.<sup>3-5</sup> The majority of cutaneous cysts found in dogs are follicular cysts.<sup>2</sup> In regards to the dog described above, the papules exhibited multiple dilated cysts filled with laminated keratin, an lining epithelium composed of stratified squamous epithelium with a distinct granular cell layer and no adnexal differentiation from the cyst wall. However, some cysts showed sebaceous gland lobules and sweat glands attached to the deepest region of the cyst. Therefore, the cysts in the present case had all the requisite histological characteristics of follicular cysts.

Follicular cysts can be further classified according to the differentiation of their epithelial lining into infundibular, isthmus-catagen, matrical and hybrid forms.<sup>3</sup> Infundibular cysts were previously called as epidermoid cysts, epidermal inclusion cysts and epithelial inclusion cysts. Infundibular cysts are lined by squamous epithelium with

a granular cell layer, whereas isthmus-catagen cysts are lined by squamous epithelium with a sparse or absent granular cell layer.<sup>5</sup> In this case, the lining of epithelial cells showed a granular cell layer. Therefore, the present case supports evidences of multiple infundibular cysts in a dog. Infundibular cysts arise from the hair follicle infundibulum and are the most common follicular cysts of the dog.<sup>3</sup>

The pathogenesis of cutaneous follicular cysts in dogs is usually unknown but in some cases may be a result of repeated external trauma to the skin surface, such as callus formation over bony pressure-points, or congenital factors.<sup>3,6</sup> External trauma induces plugging or narrowing of follicular ostia causing retention of follicular contents. Consequently, the retention of follicular contents causes dilation and, eventually, formation of follicular infundibular cysts.<sup>6</sup> In dogs, compound hair follicles can contain 15 or more secondary follicles entering and exiting one compound follicle unit. Therefore, plugging or narrowing of the follicular ostia can cause the formation of multiple cysts.<sup>6</sup> In the present case, the affected dog had moderate anal sacculitis. Anal sacculitis typically causes repeated scooting or licking the area around the anus, although the dog breeder may not have observed such signs. Therefore, the multiple follicular cysts in the present case appear to be primarily a sequela to chronic external trauma to the perianal area, probably in response to anal sacculitis. However, anal sacculitis and its associated clinical signs are common in dogs, whereas perianal follicular cysts are rare. Other factors, such as congenital or breed-related predisposition for follicular hyperkeratosis, may also have contributed to cyst formation in this dog.

Follicular cysts are reported to be commonly found in dogs; they are usually solitary, less than 2 cm in diameter,

and have no breed, sex, age or site predilections.<sup>2,3</sup> A few cases of multiple follicular cysts have been reported in young dogs, sheep and horses.<sup>2</sup> One could hypothesize that the multiple infundibular follicular cysts were caused by trauma to the perianal skin as a result of scooting and licking. However, this seems highly unlikely as perianal trauma is very common in dogs, but associated more than 100 cysts locally limited perianal area have not been previously reported. The present report describes a unique case of multiple perianal infundibular follicular cysts in a dog. The pathogenesis is probably multifactorial; additional examples of this condition may aid in identifying the contributing factors.

## References

1. Parker WM. Multiple (more than two thousand) epidermal inclusion cysts in a dog. *Canadian Veterinary Journal-revue Veterinaire Canadienne* 1995; 36: 386–7.
2. Scott DW, Teixeira Eduardo AC. Multiple squamous cell carcinomas arising from multiple cutaneous follicular cysts in a dog. *Veterinary Dermatology* 1995; 6: 27–31.
3. Scott DW, Miller WH Jr, Griffin CE. *Muller and Kirk's Small Animal Dermatology*, 6th edn. Philadelphia, PA: W.B. Saunders, 2001. p. 1375–9.
4. Hillyer LL, Jackson AP, Quinn GC, *et al.* Epidermal (infundibular) and dermoid cysts in the dorsal midline of a three-year-old thoroughbred-cross gelding. *Veterinary Dermatology* 2003; 14: 205–9.
5. Ginel PJ, Zafra R, Lucena R, *et al.* Multiple generalized follicular cysts in a stallion. *Veterinary Dermatology* 2007; 18: 456–9.
6. Duclos DD, Hargis AM, Hanley PW. Pathogenesis of canine interdigital palmar and plantar comedones and follicular cysts, and their response to laser surgery. *Veterinary Dermatology* 2008; 19: 134–41.

**Résumé** Ce rapport décrit le cas d'un cocker spaniel mâle de 7 ans atteint de multiples kystes folliculaires infundibulaires périanaux. Cliniquement, l'animal présentait une sacculite anale modérée, un prurit périanal entraînant signe du traîneau et léchage de la zone. L'examen de la zone périanaux révélait plus de 100 papules bien délimitées, fermes, mesurant de 0.2 à 0.5 cm de diamètre avec un pore central associé à de l'alopecie. La peau périanaux excisée chirurgicalement a été soumise à un examen histopathologique. Microscopiquement, le tissu révélait de multiples kystes dilatés, remplis de kératine, les papules correspondant à l'infundibulum des kystes folliculaires. Le chien atteint montrait une sacculite anale modérée. La sacculite anale entraîne généralement un signe du traîneau ou le léchage de l'aire autour de l'anus. En outre, les kystes folliculaires multiples dans le cas présent semblent être une séquelle des traumatismes externes chroniques de l'aire périanaux, probablement en réponse à la sacculite anale. A la connaissance de l'auteur, cette description est le premier cas de multiples kystes folliculaires infundibulaires périanaux chez un chien.

**Resumen** Este artículo describe un caso de un perro macho de siete años de edad de raza Cocker Spaniel con múltiples quistes foliculares infundibulares en la zona perianal. Clínicamente el perro tenía saculitis anal moderada y prurito perianal, lo cual causaba al perro explorar y lamer la zona. En el examen clínico la zona afectada tenía más de 100 pápulas circunscritas de consistencia firme, variando entre 0,2 y 0,5 cm de diámetro con un poro central, y que se encontraban en la región perianal. También se observaba alopecia. Se extirpó la zona afectada y se envió para estudio histopatológico. Microscópicamente se veían múltiples quistes dilatados rellenos de keratina y las pápulas correspondían con quistes foliculares infundibulares. El perro mostraba saculitis anal moderada. Esta condición a menudo causa que los perros exploren y se laman la zona alrededor del ano. Por lo tanto los quistes foliculares en este caso parecen ser una secuela de trauma externo en la zona del perineo, probablemente en respuesta a la saculitis anal. A nuestro entender, este artículo es el primer caso documentado de múltiples quistes foliculares perianales en un perro.

**Zusammenfassung** Dieser Fallbericht beschreibt einen siebenjährigen, männlichen Cocker Spaniel mit multiplen perianalen infundibulären follikulären Zysten. Klinisch zeigte der Hund eine moderate Analbeutelentzündung, perianalen Juckreiz, welcher „Schlittenfahren“ und ein Belecken der Gegend ver-

ursachte. Bei der Untersuchung der betroffenen Region wurden mehr als 100 harte, gut abgegrenzte Papeln, die eine Größe von 0,2 bis 0,5 cm im Durchmesser mit einer zentralen Pore aufwiesen, in der Perianalgegend gefunden. Alopezie trat in der Perianalgegend auf. Das Hautgewebe in der Perianalgegend wurde chirurgisch entfernt und für eine histologische Untersuchung eingeschickt. Mikroskopisch zeigte das Gewebe multiple Keratin-gefüllte Zysten und die Papeln stimmten mit infundibulären folliculären Zysten überein. Der betroffene Hund zeigte eine moderate Anal Sacculitis. Eine Analbeutelentzündung verursacht häufig wiederholtes „Schlittenfahren“ und ein Belecken der Gegend rund um den Anus. Daher scheinen die multiplen folliculären Zysten im gegenwärtigen Fall in erster Linie eine Folge des chronischen äußeren Traumas der Perianalgegend zu sein, möglicherweise als Reaktion auf die Analbeutelentzündung. Nach dem besten Wissen des Autors handelt es sich hierbei um den ersten dokumentierten Fall von multiplen infundibulären folliculären Zysten bei einem Hund.