

NASAL ASPERGILLOSIS ASSOCIATED WITH AN IMPACTED CANINE TOOTH IN A BELGIAN SHEPHERD DOG

Nasale aspergillose geassocieerd met een geïmpacteerde hoektand bij een Belgische Herder

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ABSTRACT

A 9-month-old Belgian shepherd dog was evaluated for chronic nasal discharge. Oral examination revealed the absence of the left upper canine tooth. Radiographs showed impaction of this tooth into the left nasal cavity with caudal displacement of the tooth root. Rhinoscopy demonstrated the presence of fungal colonies. The impacted tooth was surgically removed and the nasal cavity flushed with enilconazole 1%. No recurrence was observed during a follow-up period of two years.

SAMENVATTING

Een Belgische Herder van 9 maanden werd aangeboden met klachten van chronische neusvloei. Bij inspectie van de mondholte werd de afwezigheid van de linker bovenste hoektand waargenomen. Op radiografie werd deze tand geïmpacteerd in de linker neusgang teruggevonden met een caudale verplaatsing van de tandwortel. Rinoscopie toonde schimmelkolonies aan. De geïmpacteerde tand werd chirurgisch verwijderd en de neusgangen werden met enilconazole 1% gespoeld. De hond bleef vrij van klachten gedurende een opvolging van 2 jaar.

INTRODUCTION

Nasal aspergillosis is an infection that progressively invades the nasal cavities and paranasal sinuses (Sharp *et al.*, 1991). In most dogs, the underlying cause is usually not determined, though it is sometimes associated with facial trauma, tooth root abscess, a foreign body or neoplasia (Suter, 1984; Schreyer, 1996). In humans, foreign bodies are considered to cause an alteration of the respiratory epithelium by cilia paralysis, soft-tissue hypervascularization and edema (Lenglinger *et al.*, 1996). Foreign bodies also provide hiding places for the ubiquitous *Aspergillus* spores that cannot be removed by the altered respiratory epithelium (Bader, 1989; Lenglinger *et al.*, 1996). Finally, certain substances such as heavy metals (foreign bodies) or zinc oxide-eugenol (dental cement) can also be used by *Aspergillus* in its metabolism (Lenglinger *et al.*, 1996).

The majority of dogs with nasal aspergillosis have been treated unsuccessfully for months (mean = 9 months) with antibiotics (Sharp *et al.*, 1991; Zonderland *et al.*, 1999). This improper treatment allows the progression of the destructive process, thus complicating the treatment procedure.

In the present report, we describe a possible relationship between an impacted tooth and nasal aspergillosis.

CASE DESCRIPTION

A 26 kg, 9-month-old, male Belgian shepherd dog was referred with a history of a yellow-brown nasal discharge of 6 months' duration. Previous treatment included multiple courses of antibiotics without any improvement in the dog's condition.

On presentation, a mucopurulent nasal discharge was present on the left side and the left nostril was partially depigmented. The permeability of the left nasal cavity was increased compared with the right nasal cavity. Sneezing was also present. Oral examination revealed the absence of the left upper canine tooth. A complete blood count showed a mild eosinophilia (951/mm; normal <750/mm). Right-left lateral and dorsoventral radiographs revealed an abnormally-shaped left upper canine tooth which was impacted into the left nasal cavity. The tooth root was caudally displaced and hypoplastic (Fig. 1). At rhinoscopic examination, a mucopurulent material, turbinate destruction and irregular, white shiny masses corresponding to fungal colonies were visible in the left nasal cavity. Samples for mycologic culture and cytology were collected. A suppurative inflammation (neutrophiles and macrophages) was demonstrated cytologically and a mixed inflammatory reaction (neutrophiles and macrophages) was seen in the histologic preparations. Mycology (Sabouraud agar culture followed by microscopic examination) was positive for *Aspergillus fumigatus*. Agar gel double diffusion (AGDD) of serum showed a double precipitation arc for *Aspergillus fumigatus*.

A dorsal rhinotomy was performed on the left side of the nasal planum by creation of a bone window (1x4cm). The impacted tooth was extracted and curettage of the nasal cavity was performed. The nasal cavity was infused with enilconazole (10ml of a 1% Imaverol suspension) and the surgical site was closed. The dog was presented each 6 months for physical examination during a follow-up period of 2 years and no recurrence of the clinical signs was observed.



Fig. 1. Lateral projection of the nasal cavity demonstrating the presence of a rostro-dorsally oriented impacted canine tooth lying close to the nasal floor (arrow). The root of the tooth lies rostral to the 2nd premolar. The tooth root and crown are hypoplastic.

DISCUSSION

Unilateral chronic nasal discharges may be caused by foreign bodies, oronasal fistula, dental disease, fungal infection, neoplasia or combinations of these (McKiernan, 2000). In the present case, an oronasal fistula was excluded by the oral examination and neoplasia seemed less probable due to the young age of the patient and the absence of external deformation. The absence of the tooth may have been due to agenesis, impaction or fracture (Hennet, 1991). Only radiography permits definite differentiation between these conditions (Hennet, 1991). An impacted tooth is not associated with clinical signs unless it interferes with the nasal function or if infection or cyst formation are present (Field *et al.*, 1982). In this case, a fungal infection better explained the nasal discharge.

An impacted tooth is a rarely recognized condition that may be caused by lack of space in the dental arch, insufficient resorption of the deciduous teeth, genetic misalignment of the tooth bud, traumatic or micro-traumatic insult or any dysfunction in the normal sequence of eruption of the tooth (Jacoby, 1983; Rossman *et al.*, 1993). In the present case, the tooth was macroscopically normally mineralized, but the tooth bud had been displaced and rotated. The root and crown were hypoplastic and the shape was abnormal. These features may indicate a dysfunction of the epithelial development of the tooth as epithelial tissue is responsible for tooth mineralization and shape, while mesenchymal tissue is responsible for pulp and dentin formation (Wiggs, 2000). The abnormal shape of the tooth may also have been a consequence of the obstacles encountered during eruption (Gauthier, 1997). Canine distemper viral infection has also been associated with multiple dental anomalies, including tooth impaction and abnormal shape of an otherwise normally mineralized tooth (Bittegeko *et al.*, 1995). Impaction may be partial or complete, with the tooth found in the palate or, as in this case, laterally in the nasal cavity (Rossman *et al.*, 1993). When an impacted tooth is associated with clinical signs, surgical removal is indicated. The necessity of infusing enilconazole into the nasal cavities, as performed in this case, may be questioned as cases of nasal aspergillosis associated with foreign bodies have been successfully treated by removal of the foreign body (Bader, 1989; Lenglinger *et al.*, 1996). Indeed, a case of chronic fungal rhinitis in a dog with a canine tooth abscess and secondary oronasal fistula was also treated successfully by removal of the impacted tooth without antifungal treatment (Schreyer, 1996).

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