

# BRACHYCEPHALIC DOGS PREDISPOSITION TO FOLLICULAR GASTRITIS : A RETROSPECTIVE STUDY OF 55 CASES (2006 - 2011)



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## Abstract

Upper respiratory syndrome in brachycephalic dogs (BDs) has been associated with histologic lesions of gastritis. The aim of this retrospective study was thus to assess the prevalence of follicular gastritis (FG) in BDs compared to other breeds. FG is defined by presence of lymphoid aggregates or follicles in the gastric mucosa (involving more than 5% of the biopsy area).

The medical records of all the dogs referred for vomiting and undergoing a gastro-duodenoscopy at the Clinic Alliance, Bordeaux, France, between January 2006 and February 2011 were reviewed. Breed, age, weight, sex, presence of *Helicobacter* spp and histological diagnosis were recorded. Based on gastric histology, dogs were divided into 2 groups, group A suffering from FG (n=55) and group B in which no histological lesion of FG were found (n=100). All biopsies were performed by the same investigator (VF) and all the slides reviewed by the same pathologist (AP) according to the 2008 WSAVA Gastrointestinal Standardisation Group Criteria. Chi-square tests were used for comparison of proportions. ANOVA tests were used to compare age and weight of dogs with or without FG.

Group A included 29 males and 26 females, Group B, 58 males and 42 females. Mean (±SD) weight in group A and B was 17.0(±12.5) kg and 16.4 (±11.8) kg respectively. Mean age in dogs affected with FG (3.6 (±3.3) y.) was significantly lower (p<0.001) than in group B (7.0 (±4.0) y.). FG was significantly (χ<sup>2</sup> p<0.001) more frequent in BDs (61.9%), than in other breeds (25.7%). French Bulldogs accounted for 27.8 % of the FG. *Helicobacter* spp were identified in 34.6 % (19/55) of the gastric samples of dogs with FG against 16.0% (16/100) of the dogs without FG (χ<sup>2</sup> p= 0.008). Vomiting was the most common clinical sign (72,2%) associated with FG but was not specific.

Results of the present study show that 1/BDs, and especially French bulldog (this breed represents only 2.5 % of the litter in France) are predisposed to FG. 2/FG affects young dogs 3/ and is associated with *Helicobacter* spp.

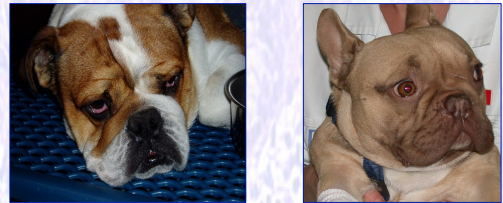
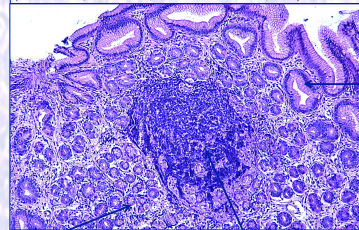


Fig 1 : Follicular gastritis. Low magnification photomicrograph illustrating the presence of a mild lymphofollicular hyperplasia (formalin-fixed, H&E stained, 4 micron tissue section, X100)



Mild epithelial hyperplasia with uniform increased thickness of gastric pit epithelial lining. Mild dilation of pit lumen, with mild folding of epithelium.

Mild increase in mucosal lymphocytes and plasma cells

Mild lymphofollicular hyperplasia with lymphoid aggregates or follicles occupying 10–30% of biopsy area

## Introduction

Upper airway obstruction has frequently been described in brachycephalic dogs (BDs). The prevalence of gastrointestinal problems in 73 brachycephalic dogs presented with upper respiratory syndrome has been clinically and endoscopically studied in a previous report (Poncet and others 2005). Post endoscopic histologic evaluation of digestive biopsies revealed inflammatory lesions as gastritis.

Follicular gastritis (FG) is defined by presence of lymphoid aggregates or follicles in the gastric mucosa (involving more than 5% of the biopsy area) associated with other histologic changes : mucosal fibrosis and/or atrophy and diffuse inflammation. Endoscopic description consists in characteristic diffuse or localised multiple mucosal erythematous punctuations. This histological entity is poorly described in dogs.

The aim of this retrospective study was to describe population characteristics of the dogs presenting follicular gastritis.

## Material and Methods

- **Animals** : the study was based on the histological results of upper digestive biopsies of all the dogs referred for a gastro-duodenoscopy to Alliance Veterinary Clinic in Bordeaux (F) between february 2006 and january 2011.
- Breed, sex, age, weight, presence of *Helicobacter* spp on histological examination and histological diagnosis were recorded for each dog.
- **Admission and gastro-duodenoscopy** : all the dogs were medically managed by the same operator (V. Freiche/ Olympos Video-Endoscope CLV-160). At least, six biopsies were performed in the different areas of the stomach and the duodenum. Macroscopic appearance of the lesions was described.
- **Histopathological analysis** : Endoscopic biopsy samples were fixed in 4% neutral buffered formalin, paraffin embedded and routinely processed. Multiple four-micron sections were cut and stained with Hematoxylin and Eosin for histologic evaluation. All slides were examined and graded by a single pathologist (A. Poujade) according to the WSAVA Gastrointestinal Standardization Group's Histopathological standards for the diagnosis of gastrointestinal inflammation (2008)
- **Statistical analysis** : Chi-square tests were used for comparison of proportions. ANOVA tests were used to compare age and weight of dogs with or without FG.

## Results

- 155 dogs were included in the study and divided into two groups, classified according to histologic results :
  - Group A (n=55) suffering from FG
  - Group B (n=100) without FG.
- Group A and group B datas are listed in table 1.
- **Mean age** in dogs affected with FG 3.6 (±3.3) y.) was significantly lower (p<0.001) than in group B (7.0 (±4.0) y.).
- **FG was significantly** (χ<sup>2</sup> p<0.001) **more frequent in BDs** (61,9%), than in other breeds (25,7%).
- ***Helicobacter* spp were identified in 34.6 %** (19/55) of the gastric samples of dogs with FG against 16.0% (16/100) of the dogs without FG (χ<sup>2</sup> p= 0.008).

	n	Gender	mean age	mean weight	BDs	<i>Helicobacter</i> spp
<b>Group A</b>	55	M = 29 F = 26	3,6 yo*	17 kgs	61%*	34,6 %*
<b>Group B</b>	100	M = 58 F = 42	7 yo	16,4 kgs	27%	16%

Table 1 : Group A and Group B datas

## Discussion

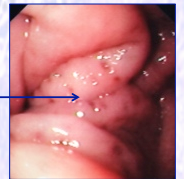
- Follicular gastritis well known in human medicine but is less described in the dog. Gastric infection with *Helicobacter* spp is common in dogs, with a prevalence ranging from 67 to 100% in healthy dogs, and 74 to 100% in dogs presented with vomiting. Its association with follicular gastritis (FG) has been investigated, and gastric lymphoid infiltrates seemed to represent an immune response in the gastric mucosa to the bacterial antigens.
- In this study, if vomiting was the most common clinical sign to indicate gastro-duodenoscopic investigation, it was not specific of the gastritis type.
- Histologic analysis showed that BDs and particularly French bulldogs accounted for 27.8 % of the FG : among the 8,7 millions of dogs in France, French Bulldogs are poorly represented (2,6%).
- As FG affects younger dogs, and particularly French bulldogs, further studies are needed to know if *Helicobacter* spp and FG are commonly found in young dogs of any breeds, and could represent a normal step in gastric immune maturation.

## Conclusion

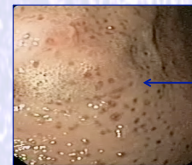
The main conclusions are that

- ✓ Brachycephalic dogs , and especially French Bulldog are predisposed to follicular gastritis (this breed represents only 2,6 % of the litters in France).
- ✓ Follicular Gastritis affects young dogs.
- ✓ Follicular gastritis was significantly associated with *Helicobacter*-type bacterias in this study.

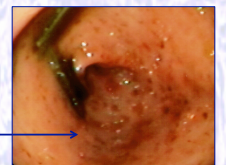
Gastroscopy : Erythematous punctuations on gastric oedematous folds in a 2,5 years old female French bulldog



Gastroscopy : diffuse fundic severe follicular gastritis in a one year old male French bulldog



Gastroscopy : diffuse antral severe follicular gastritis in a 3 years old male French bulldog : a pyloric stenosis is suspected. Food persistence suggests delayed gastric emptying.



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