Nasopharyngeal stenosis in four cats

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ABSTRACT
Nasopharyngeal stenosis secondary to chronic upper respiratory tract infection is described in four cats. The stenosis is caused by a thin but tough inflammatory membrane which develops across the proximal nasopharynx, partly or completely occluding it. Diagnosis is aided by use of a dental mirror for caudal rhinoscopy, together with test passage of a fine catheter through the ventral nasal meatus. All four cases were treated successfully by surgical resection of the membrane through an incision in the soft palate. Nasopharyngeal stenosis should be considered in the differential diagnosis of all chronic upper respiratory disease in cats.

INTRODUCTION
Chronic upper respiratory disease is a common clinical entity in cats. Such cats, often referred to as ‘snufflers’ exhibit a range of signs including snuffling, sneezing, mucoid purulent or sometimes bloodflecked nasal discharge and varying degrees of nasal obstruction which in severe cases may enforce mouth breathing in the cat. Severe cases may also be in poor condition and experience difficulty with eating (Lane 1982).

Differential diagnoses usually considered in such cases include foreign bodies, bacterial and allergic rhinitis and sinusitis, mycotic rhinitis, nasopharyngeal polyps, intranasal neoplasia and lymphocytic plasmacytic pharyngitis and laryngitis (Norris and Laing 1985).

Recently the author investigated several cats exhibiting signs of upper respiratory obstruction which was caused by an acquired stenosis of the nasopharynx. In this condition a thin membrane of inflammatory origin develops across the nasopharynx, partly or completely occluding it. The clinical presentation, diagnostic evaluation and treatment of this condition is described here.

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A typical case is described in detail below and another three, which closely resemble the first, have been summarised.

Case 1
A 10-year-old spayed female Siamese cat with a six month history of upper respiratory difficulty was presented. Several previous courses of antibiotics and corticosteroids had failed to resolve the respiratory disease. The presenting signs were of snuffling and partial nasal obstruction but with little nasal discharge. No external swellings or oral lesions were seen.

The cat was anaesthetised for further investigation. Upon tracheal intubation the respiratory difficulty and noise resolved. Radiographs of the nose, pharynx, trachea and lungs were normal. Rostral rhinoscopy was unremarkable. Test passage of a 3.5 French gauge urinary catheter through either ventral nasal meatus revealed obstruction at the level of the caudal nares. Caudal rhinoscopy with the aid of a dental mirror showed that the opening of the nasopharynx into the caudal nares, normally an oval opening approximately 6 mm dorsoventrally by 5 mm in width, was reduced to a pin-hole sized opening by the presence of a thin but tough membrane (Fig. 1). The end of the catheter passed through the nose could be seen impinging on the membrane but would not pass through it.

Access to the nasopharynx was improved by making a midline incision through the soft palate. The stenotic opening was enlarged by excision of the membrane. The soft palate was sutured with absorbable material (3-0 Dexon ‘S’, Davis and Geck Inc) and amoxycillin oral drops (Amoxil Aqueous Drops; Beecham) were given for seven days postoperatively. The cat’s breathing was normal immediately postoperatively and has remained so for over two years.

Histologically, the excised membrane showed diffuse submucosal fibrosis with mild infiltration with mast cells, eosinophils and lymphocytes. The histological diagnosis was chronic inflammatory rhinitis, possibly of allergic origin (Fig. 2).

Case 2
An eight-month-old male castrate shorthair cat with signs of upper respiratory obstruction for five months. Clinical findings and treatment were as for case 1. Histologically the cellular infiltration of the membrane suggested a bacterial infection as the inciting cause.

Case 3
A four-year-old female spayed domestic shorthair cat with a three month history of snuffling respiration and upper respiratory obstruction. Clinical findings, treatment and histology were identical with cat 1.

Case 4
A four-year-old Abyssinian-cross female spayed cat was presented which, in addition to respiratory difficulty, also showed signs of retching and gagging when it ate. These signs had been present for two years. When this cat was examined under
Fig. 1. Line diagrams depicting the appearance of the nasopharynx in a normal (A) and abnormal (B) cat. The cat is in sternal recumbency with the mouth held widely open.

h  Hard palate.

e  Epiglottis with adjacent laryngeal opening.

s  Soft palate with its margins retracted rostrolaterally with fine forceps. Adequate visualisation of the nasopharynx can be achieved either by this method or by use of a dental mirror.

A shows the normal opening of the nasopharynx being ovoid and approximately 5 mm in diameter.

B shows the stenotic opening with a thin membrane over the nasopharynx and a central pinpoint orifice.

Fig. 2. Section through the resected nasopharyngeal membrane in case 1. There is submucosal fibrosis and infiltration with mast cells, eosinophils and lymphocytes. Haematoxylin and eosin × 10.
anaesthesia, an asymmetrical defect was found in the soft palate, measuring 0.75 cm in diameter and most likely of traumatic origin. As with the other cases there was a nearly complete membrane across the nasopharynx. After this membrane was resected, the soft palate defect was trimmed around its edges and was sutured closed. Slight breakdown of this repair necessitated a second repair a few weeks later.

**DISCUSSION**

All four cases had several features in common: (a) Signs of upper respiratory obstruction with a whistling or snoring noise characteristic of a blockage at the nasopharyngeal level.

(b) Signs indicating obstruction with minimal nasal discharge.

(c) Signs often aggravated during eating or swallowing.

(d) Chronic duration of at least several months.

(e) Failure to respond to conventional medical therapy for upper respiratory tract infection.

(f) All cats had normal respiration prior to onset of clinical signs.

As the clinical signs were similar to those encountered in other upper respiratory obstructive conditions, diagnosis of nasopharyngeal stenosis involved ruling out the other diagnoses and positively recognising the stenosis by a combination of caudal rhinoscopy and test passage of a catheter through both nasal chambers. In normal cats it is possible to pass a 3 French gauge catheter through the ventral nasal meatus into the pharynx.

A condition described as nasopharyngeal cicatrix has recently been described in 47 horses (Schumacher and Hanselka 1987), where web-like strands of scar tissue were found across the nasopharynx. Most of these horses had other forms of laryngeal and nasopharyngeal disease and in only three cases was the nasopharyngeal stenosis considered to be severe enough to cause respiratory impairment. No treatment was attempted in the horses.

In man, nasopharyngeal cicatrices are reported after acute and chronic ulcerative pharyngitis, due to both caustic burns and a range of infectious diseases, and would appear to be rather similar to the cat condition described here. Recurrence of stenosis after surgery has been a problem in man (Stevenson 1969).

History in the cat cases and histological examination of the excised membrane suggest that the membrane is an acquired structure developing secondary to a chronic inflammatory stimulus. However it is difficult to prove an inflammatory origin as some inflammation would accompany any obstruction to the nasopharynx, because of interference with clearance of nasal debris. The histological changes in the membrane are similar to those found in chronic rhinitis and sinusitis, although neither of these conditions was present to a significant extent in any of the four cases at the time of presentation. Often chronic rhinitis and sinusitis are initiated by feline herpesvirus, coronavirus or chlamydial infections. In these conditions, particularly in herpesvirus rhinotracheitis, severe mucosal ulcerations are often present and it
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may be that the initiating stimulus for development of the stenotic membrane was mucosal ulceration around the nasopharynx. In case 4 the aetiology was apparently related to chronic inflammation in response to food material being displaced into the nasopharynx through a soft palate defect which was probably traumatic in origin. As all four cases resolved after excision of the membrane and no relapses occurred, it appears that the inflammatory stimulus that originally led to the development of the membrane had resolved. Occasionally distal oesophageal strictures occur in cats and dogs secondary to gastric reflux that occurs under general anaesthesia. All four cats in this report had been anaesthetised previously for neutering, but as there was no correlation between the time of neutering and development of the nasopharyngeal stenosis, it would appear very unlikely that the stenosis had resulted from gastric reflux.

In the treatment of the condition it was necessary to make a saggital incision in the soft palate and to retract the edges of the palate in order to expose the membrane for excision. It did not appear to be possible to break down the membrane by attempting to force a catheter through it. Access through the incised soft palate was satisfactory and with the exception of case 4 no difficulty was experienced in achieving good primary healing of the sutured soft palate. Effectiveness of the treatment in achieving resolution of a long-standing respiratory problem indicates the importance of investigating all cases of chronic upper respiratory disease in cats for evidence of nasopharyngeal stenosis. The most effective means of doing this is test-passage of a small bore catheter through both ventral meati to ascertain patency, together with visual inspection of the nasopharynx with the aid of a dental mirror.

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