How I treat Canine Nasal Aspergillosis
Dr Steven Holloway
Faculty of Veterinary Science
The University of Melbourne
250 Princes Highway
Werribee Vic, 3030

Straight up I have to say that I have never treated a case of feline nasal aspergillus so I am going to leave the discussion of others and discuss issue related to treatment.

Canine Nasal Aspergillosis

Diagnosis
Imaging. CT evaluation is very helpful for determining the extent of disease and involvement of the cribriform plate and sinuses. Rhinoscopy is useful for diagnosis and evaluating response to therapy. Biopsies and culture of fungal biopsy material should be attempted in all cases. Fungal cultures and sensitivity testing for species other than Aspergillus can be helpful as species such as Scedosporium apiospermum in our experience may have variable sensitivity to clotrimazole and other azoles.
Serology should not be used to make a diagnosis without other supportive evidence.

Treatment Options
Several options are available for treatment of nasal aspergillus. These are:
1. Oral azoles such as ketoconazole, itraconazole, fluconazole
2. 1-hour topical clotrimazole via indwelling Foley catheters
3. Topical enilconazole via surgically placed catheters
4. Endoscopic placed catheters and enilconazole treatment
5. Open nasal treatment via rhinotomy and placement of Betadine sponges

Which one?
Nasal Aspergillus should be considered a topical disease. Histopathology of affected lesions shows the majority of fungal elements to be on the surface of the affected tissues with intense infiltration with lymphoplasmacytic cells. For this reason topical therapy should be effective in treating Aspergillus. Nasal destruction is mediated by the Aspergillus toxins and the intense inflammatory reaction.

Several studies suggest that oral therapy is less effective than topical therapy. Of the oral therapies, itraconazole 5 mg/kg PO BID (Sporanox) is superior to ketoconazole (Nizoral) but is quite expensive. Fluconazole 2.5-5.0 mg/kg PO SID is also effective but is the most expensive of the three drugs. Monitoring of liver function is required as hepatotoxicity is common with prolonged therapy. We suggest serial ALT and bilirubin measurements.

We routinely use a 1-hour Clotrimazole (Canestan) infusion with 15-minute rotations. A down side of this formulation is that it causes some pharyngeal oedema and careful packing of the pharynx with swabs to avoid contact is required.
Topical treatment with enilconazole with sinus trephine holes should be as effective. However, the idea that the sinuses are better treated using this method is not supported by current data. 

**Surgery** is limited only to cases that are topical treatment failures. Open nasal treatment with topical Betadine is an aggressive option and should be reserved for animals that have failed topical therapy and sinusotomy/tube placement followed by enilconazole.

Complicating issues

- **Wrong fungus.** Other filamentous fungi have been implicated such as *Penicillum species* and *Scedosporium apiospermum*. These may be less sensitive to clotrimazole than Aspergillus. Some improvement in *in vitro* MICs may be seen by adding oral terbinafine (Lufenuron) to the treatment but hard data is lacking for *in vivo* cases.
- **Sinus involvement.** In most cases, the sinuses will be adequately treated with infusions just as well as surgical techniques.
- **Invasion of the cribriform plate.** If this is identified on CT then direct infusion should be replaced by careful topical application of clotrimazole and the use of oral itraconazole.
- **Recurrence.** This is common and nearly every case I have treated has required 2 to 3 applications.
- **Pharyngeal oedema.** This may be severe with Canestan solutions and should be avoided if possible by carefully placing the pharyngeal Foley catheter and packing the throat with gauze swabs prior to infusion.
- **Subcutaneous emphysema after trephine holes are placed in sinuses.** This is a nuisance but resolves with time. It tends to cause grief with owners more than any major problem.

When to stop.

Clinical signs of some sneezing may persist but successful therapy usually results in 90% improvement within a week. We like to re-scope the nose 2-3 weeks after each treatment and then decide if further treatment is required. If more than three treatments is insufficient then using the enilconazole option via indwelling catheters is the next option. Surgery using rhinotomy is a last resort!


