**COMPUTED TOMOGRAPHIC FINDINGS IN 20 DOGS AND 6 CATS WITH CONFIRMED NASAL FOREIGN BODIES**

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Nasal disease, rhinoscopy, dogs, cats

**Conflict of interest disclosure**

None of the authors have a conflict of interest regarding this study.

**Previous presentation or publication disclosure**

Preliminary results of this study were presented in the Pre-BSAVA EAVDI-BID meeting (April 2018), Birmingham, United Kingdom and in the “XVII Congreso de Especialidades Veterinarias AVEPA (April 2018), Madrid, Spain.

**Abstract**

The diagnosis and treatment of nasal foreign bodies usually includes a combination of rhinoscopy and imaging techniques, such as computed tomography (CT). The purpose of this retrospective, multicentric study was to describe the CT characteristics of nasal foreign bodies in dogs and cats and to determine if different nasal CT features exist between acute and chronic cases.20 dogs and 6 cats met the inclusion criteria. Eleven nasal foreign bodies (42%) were detected confidently with CT. The foreign body had a linear shape in 81% of cases and displayed a “tubular-like appearance” in 54% of cases. In 5 cases (19%), a foreign body was suspected but not clearly visible. Additional CT changes were present in the nasal passages in 96% of the cases. The presence of turbinate destruction (P = 0.021) and mucosal thickening (P = 0.014) on CT were associated with the presence of a chronic nasal foreign body. In this sample, the nature of the foreign body did not influence its visibility and was not associated with specific CT characteristics. CT may be useful in the investigation of nasal foreign bodies, however a negative CT examination does not exclude their presence.

**Introduction**

Nasal cavity disease is common in dogs and cats.1,2,3,4 Clinical signs associated with nasal disease in these species are non-specific and usually varied; signs include nasal discharge, sneezing and epistaxis.1,2,3,4,5,6 The most common causes of chronic nasal disease in dogs include nasal neoplasia, lymphocytic-lymphoplasmacytic rhinitis and fungal disease.2,3,4,7 In cats, neoplasia and chronic rhinitis are the most commonly reported.1,5,7 The prevalence of nasal foreign bodies as a cause of chronic nasal disease varies in the literature, ranging between 5 and 20% in dogs2,3,4,8 and between 2.6% and 10% in cats.1,5

The benefits of CT for the evaluation of nasal disease have been extensively reported, and include detailed anatomical assessment (without superimposition) and accurate characterization of lesions.6,8,9,10,7,11,12 Additionally, the information gained from CT images is helpful to guide rhinoscopic evaluation and sampling.9 Several studies have described the CT findings of various chronic nasal diseases in detail, with a particular emphasis on neoplasia and rhinitis.6,8,9,10,12,13 There are limited descriptions of the CT characteristics and secondary nasal changes associated with nasal foreign bodies within the literature. These descriptions come from studies of chronic nasal disease,8,10,14 or from studies focused specifically on the imaging characteristics of the foreign body itself (e.g. grass seeds, wood),13,15 where nasal foreign bodies make up a limited number of the overall study populations. Based on our review of the literature, the specific CT characteristics of nasal foreign bodies in dogs and cats have not been previously described at the time of the current study. Furthermore, it remains unclear whether differences exist between the CT features of chronic versus acute nasal foreign bodies.

The aims of this study were to: (1) describe the CT characteristics of nasal foreign bodies in dogs and cats and (2) compare the CT characteristics of acute versus chronic nasal foreign bodies. We hypothesized that CT would be a useful technique for diagnosing nasal foreign bodies and that CT would be able to differentiate between acute and chronic cases.

**Materials and methods**

In this retrospective, multicentre study, medical records of two referral centres (Southern Counties veterinary Specialists and Anderson Moores Veterinary Specialists) were searched between January 2011 and July 2017 for dogs and cats with confirmed nasal foreign bodies. Permission to use clinical data and images for this study was provided through informed consent from the owners at the time of admission. Inclusion criteria were a full CT examination of the head (from the tip of the nose to the occiput) and a confirmed rhinoscopic diagnosis of a nasal foreign body. The diagnostic investigations in each case (including the rhinoscopic studies) were determined and performed by ECVIM board-certified medicine specialists (or ECVIM residents under the direct supervision of ECVIM board-certified supervisors) and depended on the clinical history and examination. Patients were excluded from the study if a foreign body was not observed and/or retrieved by rhinoscopy or CT-guidance. Cases where the foreign body was present within the nasopharynx only were also excluded.

Information gathered from the clinical records included species, breed, weight, age, gender, clinical history, clinical signs, duration of clinical signs and physical examination. The clinical presentation was considered acute if the clinical signs were present for 1 month or less, and chronic if they were present for greater than 1 month.9 Routine haematology and serum biochemistry results were recorded when available.

*Statistical analysis*

Statistical analyses were performed using dedicated statistical software packages; SPSS 22.0 (SPSS Inc, Chicago, Illinois, USA) and R (R version 3.2.0, The R Foundation for Statistical Computing). Independent variables were generated from signalment data, clinical records, rhinoscopy and CT reports. Variables examined were those related to the animal (species, age, weight), presence of mucosal thickening, duration of clinical signs, whether contrast was administered during CT examination, and the size and nature of the retrieved foreign body.

Descriptive statistics were calculated for all variables; continuous data summarised as medians with interquartile ranges (IQR), and categorical data as frequencies with 95% confidence intervals (95% CI). Categorical variables with many categories and/or categories containing only small numbers of animals had amalgamation into larger groups. Distribution of continuous variables was assessed with graphical analysis, probability plots and the Kolmogorov-Smirnov test.

Independent variables potentially associated with the successful detection of a nasal foreign body by CT were assessed using multivariable logistic regression analysis. The dependent (outcome) variable considered was the detection of a nasal foreign body on CT (at the level of the animal). All variables showing some association with detection on CT on initial univariable analysis (a P-value <0.25) were considered for incorporation into the multivariable model.

Independent variables potentially associated with the presence of an acute versus a chronic foreign body by CT were also assessed using multivariable logistic regression analysis. The variables included mucosal thickening, turbinate destruction, fluid accumulation and presence of regional lymphadenomegaly. A critical P-value of <0.05 was considered significant in all analyses.

**Results**

Demographics

A total of 26 animals (20 dogs – 76.9%, and 6 cats – 23.1%) met the inclusion criteria. Dogs had a median age of 60.0 months (IQR 24.0-102.0 months) and a median weight of 10.3kg (IQR 7.4-20.2kg) Cats had a median age of 72 months (IQR 20.8-123.0 months) and median weight of 4.2kg (IQR 3.8-4.3kg). Dogs included were 5 Spaniel breeds (25%), 3 Labrador retrievers (15%), 3 Terrier breeds (15%), 2 Border collies (10%), 2 crossbreeds (10%) and 5 dogs of other breeds (25%). The cats were 4 domestic shorthairs (66.7%) and 2 cats of other breeds (33.3%). There were 10 (50%) female dogs (50% entire and 50% neutered) and 10 (50%) male dogs (40% entire and 60% neutered). There were 5 (83,3%) male cats, (20% neutered and 80% neutered) and 1 female neutered cat (16.6%).

CT acquisition parameters

CT studies were performed with the patient in sternal recumbency under general anaesthesia. Three different CT scanners were used to acquire the studies: 2-slice GE HiSpeed Dual (GE healthcare, Buckinghamshire, UK), 4-slice GE LightSpeed Plus (GE healthcare, Buckinghamshire, UK), and 64-slice Siemens SOMATOM Perspective (Siemens Healthcare Limited, Erlangen, Germany). The CT scan parameters included: helical acquisition, slice thickness ranging between 0.6-3mm, 120-220 mAs, 120-130kVp, field of view 90-180mm, matrix size 512x512, and a medium and a high frequency reconstruction algorithms. When post contrast series were performed, these were acquired following intravenous administration of 2ml/kg of an iodinated non-ionic contrast agent (Omnipaque 300mgI/mL solution for injection, Iohexol, GE Healthcare, Oslo, Norway) using either manual or automated injection.

CT images were reviewed by a second year resident in diagnostic imaging (BM) and 2 experienced board-certified veterinary radiologists (IC, AH) that were aware of the presence of a nasal foreign body, but not its location or nature. The images were reviewed individually and in consensus. The images were displayed using bone window (window level 300 HU, window width 1500 HU) for high frequency reconstruction algorithm, and soft tissue window (window level 50 HU, window width 350 HU) for medium frequency reconstruction algorithm, and were evaluated using DICOM viewer software (Osirix, version 7.0.1, Pixmeo, Switzerland). Multiplanar reconstructions (dorsal, sagittal and transverse) were used to evaluate all studies.

The CT images were evaluated using a standardized form (Supplementary file 1). Firstly, the presence or absence of a convincing nasal foreign body was recorded. A nasal foreign body was defined as an abnormal structure located within a nasal meatus or amongst the nasal turbinates, which had a geometric shape that allowed clear differentiation from the normal nasal anatomy. If a foreign body was not clearly visible but the readers considered its presence “suspicious”, this was also recorded. The lateralization and approximate location of the nasal foreign body were recorded, as well as its shape, mean attenuation (in Hounsfield Units - HU), homogeneity, and size (maximum length, width and height whenever possible). The most useful MPR plane and image window (bone versus soft tissue) for identifying the foreign body were also documented. When available, the usefulness of the post contrast series was also recorded. To achieve this, the pre contrast images were reviewed first, and the presence/absence of the foreign body material was documented. The post contrast images were reviewed immediately after, and the presence/absence of foreign body material was also recorded. Other CT changes affecting the nasal cavity were recorded and were classified as unilateral or bilateral. When bilateral abnormalities were present, the most severely affected side was also documented. Additional findings evaluated included: presence of fluid accumulation, presence of mucosal thickening, presence of turbinate destruction, paranasal bone involvement, cribriform plate lysis, and paranasal sinus abnormalities. These were graded as mild, moderate and severe when present. Any other extra-nasal CT abnormalities, such as presence of regional lymphadenomegaly (also graded as mild, moderate and severe) or other abnormalities of the head, were also recorded.

Clinical and laboratory findings

At the time of presentation, the clinical signs had been present for one month or less in 12 cases (46%) and over a month in 14 cases (54%) (mean 1.7 months, range 1 day to 7 months). The clinical presentation usually included a combination of multiple clinical signs. The most prevalent clinical signs included sneezing, noted in 23/26 of the cases (88%), followed by nasal discharge in 15/26 cases (58%) and epistaxis in 8/26 cases (31%). Haematology and serum biochemistry tests were performed in 22 (84.6%) of the 26 cases and were all unremarkable.

CT and rhinoscopy findings

*CT characteristics of the visible nasal foreign bodies*

Eleven nasal foreign bodies were detected confidently with CT. The shape of the foreign body was linear in 9/11 cases (81.8%), linear with branching in one case (9.1%) and “jelly bean-shaped” in another case (9.1%). In 5/11 cases (45.5%) the foreign body showed a “tubular-like appearance”, characterized by a hypoattenuating centre (which varied from gas, fluid and soft tissue attenuation) surrounded by a well-defined hyperattenuating rim (Figure 1A-B). The remaining 6 foreign bodies (54.5%) were homogeneous, 3/11 (27.7%) hyperattenuating to soft tissue, one of soft tissue attenuation, one of bone attenuation and one of fat attenuation (9% each). The size of the foreign bodies was variable, but in all cases the material was longer (rostrocaudally) than wider (mediolaterally). The location of the nasal foreign bodies on CT was very variable throughout the nasal cavity. In a rostral to caudal orientation, most foreign bodies were found in a mid and caudal position (5/11, 45.5%). When considering the dorsal and ventral position, 8/11 nasal foreign bodies were located ventrally (77.7%).

In 5/11 cases (45.5%) the readers considered that the foreign bodies were clearly visible in all multiplanar reconstructions. In 6/11 cases (54,5%), the material was easier to identify in one plane, with the preferred plane varying amongst all the cases and between all the readers. In 5/11 cases (45.5%) readers considered that the use of different display parameters did not influence the visibility of the foreign body. The material was best identified with a soft tissue or bone window in 3/11 cases each (27.7%). Post contrast series were available for 6/11 cases (54,5%) and did not add any further useful information.

*CT characteristics of the suspected nasal foreign bodies*

In 5/26 cases (19.2%) a foreign body was not clearly visible; however, some CT abnormalities were present that the readers considered suggestive for the presence of a foreign body. A unilateral, focal, linear, homogeneous soft tissue attenuating lesion (20-60HU) was observed in 2/5 cases and was classified as suspicious (40%); as definitive differentiation from mucoid material or exudate was not possible (Figure 2A-C). In 3/5 cases (60%) there was a linear or irregular heterogeneous lesion, characterized by the presence of both soft tissue attenuating material and small gas bubbles (Figure 3A-C).

*Nature of the foreign bodies in relation to their appearance and visibility*

The foreign bodies retrieved by rhinoscopy included 10 grass blades, 5 grass seeds, 4 sticks or pieces of wood, 3 non-specified pieces plant material, 2 conifer fragments, 1 bamboo stick and 1 tooth (Table 1). No animal had more than one foreign body identified, or a foreign body in more than one nasal cavity.

Of the ten grass blades, 5 were not visible on CT examination (50%), 3 were confidently identified (30%) and 2 were suspected (20%). Of the visible and suspected cases, all of the grass blades were linear (100%) and 4 showed a homogenous attenuation (80%) ranging between 20 to 400 HU. Of the 5 grass seed cases, 2 were not visible on CT (40%), 2 were clearly identified (40%), and one was suspected (20%). These were linear with variable size; one (33.3%) was classified as hyperattenuating to soft tissue (60-400 HU) (Figure 4A-B) and 2 had a “tubular-like appearance” (66.7%). Of the 4 foreign bodies that were wooden in nature, 2 of them were not visible on CT (50%), one was suspected (25%), and one was clearly visible (25%). Both the visible and suspected cases were linear, with the visible case showing a “tubular-like appearance” (Figure 1A-B), and the suspected case having a heterogeneous soft tissue attenuation (between 20-60HU).

*Comparison of rhinoscopy and CT findings*

When the location of the main CT changes was compared with the rhinoscopy findings, there was agreement in all of the cases where a foreign body was either definitely seen or suspected. For the cases where the foreign body was not identified on CT, the changes were incorrectly lateralized in 3/10 cases (27.7%). Of these cases, 2 had bilateral nasal abnormalities on CT and the side recorded as more severely affected did not correspond with the location of the foreign body. In one case, unilateral changes were noted in the right nasal cavity but the foreign body was located within the left nasal cavity.

*Additional nasal changes accompanying acute and chronic nasal foreign bodies*

Additional CT changes were noted in the nasal passages in 25/26 cases (95.2%). These additional abnormalities were noted in 11/12 (91.7%) of the acute cases and in 14/14 (100%) of the chronic cases (Table 2). The changes were predominantly unilateral (21/25, 80.8%). Fluid accumulation was present in 11/12 acute cases (91.7%) and in all the chronic cases (Figure 5A-B).Of the variables analysed, the presence of turbinate destruction (P = 0.021) and mucosal thickening (P = 0.014) on CT showed some association with the presence of a chronic nasal foreign body. When incorporated into a final multivariable model, only mucosal thickening remained. There were no statistical differences between the presence of regional lymphadenomegaly in acute versus chronic cases (P = 0.97). Destruction of the nasal bones (aside from turbinates) or cribriform plate was not observed in any case.

*Factors affecting detection of a nasal foreign body with CT*

Of the variables analysed, only patient weight (P = 0.23) and species (P = 0.067) showed any evidence of association with detection of a nasal foreign body by CT. When incorporated into a final multivariable model both of these variables were significant, with dogs showing a significantly decreased odds of detection (P = 0.014), and increasing weight associated with increased odds of detection (P= 0.049) (Graph 1).

**Discussion**

All of the visible nasal foreign bodies had certain a characteristic that made their detection possible. These were generally the shape (mostly linear) and having a different attenuation than expected for normal nasal anatomy. A “tubular-like” appearance was caused by a variety of foreign bodies (2 grass seeds, a bamboo stick, conifer plant material, a grass blade, and a wooden stick), which most likely represents the hollow nature of these types of material. The soft tissue attenuating foreign bodies that were identified on CT were recognisable as they were surrounded by gas and did not conform to the normal nasal anatomy. A previous study also described detection of foreign bodies with CT based on their shape and/or internal structure.14

There was no statistical association between the nature of the foreign bodies and their detection on CT. In addition, we could not find any statistical significance between the CT characteristics and the specific nature of the material. However, some observations can be made from our results. Fifty percent of the ten grass blades retrieved with rhinoscopy were either suspected or identified with CT; they were all linear with predominantly homogenous attenuation ranging between 20 to 400 HU. A previous study14 reported 2 cases of grass blade foreign bodies within the nasal cavity, but their specific characteristics were not described. Of the 5 grass seed foreign bodies, 60% were identified or suspected with CT. All of these were linear and 2 showed a “tubular-like appearance”. Previous studies of grass seed foreign bodies using CT describe them as foci of soft tissue attenuation in air-containing structures, as elongated gas-containing foci in soft tissues, or as slightly hyperattenuating foci within soft tissues. 17,18 Another study describes the appearance of grass seeds depending on the part of the plant involved, varying from delicate linear structures representing grass seed fragments, elongated fusiform structures representing individual intact florets, or an oblong cluster of soft tissue and gas foci representing part of the spike or spikelet.15 Wooden foreign bodies were also suspected or identified in 50% of the 4 confirmed cases. These were both linear; one showing a “tubular-like appearance”, and the other showing soft tissue attenuation. A previous study of wooden foreign bodies described them as rectangular or linear, having a length larger than the width, and having a mean attenuation of 111 HU; however, there was a wide range of attenuation values, which the authors interpreted as a reflection of the differences in the density of wood and its possible absorption of body fluids.13 Another study investigating the appearance of acute wooden foreign bodies in the canine manus described them as cylindrical structures that were hypoattenuating to surrounding muscle and fat.19 A wooden nasal foreign body was described in another study as a “target shape” structure, with similar characteristics to the structures with a “tubular-like appearance” noted in this study.14

We identified other changes that were suggestive for the presence of a nasal foreign body, which included the presence of soft tissue attenuating material with a specific shape (e.g. linear), and/or the presence of a combination of soft tissue attenuating material and gas bubbles. In other studies of foreign bodies affecting multiple regions of the body, the presence of other CT changes (such as inflammation, surrounding contrast enhancement, presence of cavitary lesions, tracts, and pulmonary consolidation) has been reported to be helpful for identifying the site of the foreign body.17,18,19 However, the signs suggestive of the presence of a nasal foreign body described in this study have not been previously reported in the literature.

Secondary changes within the nasal passages, aside from the presence of a foreign body, were observed in 96% of the cases with CT. Of the cases with secondary abnormalities, these were most commonly unilateral (85%) and included the presence of fluid accumulation (100%), mucosal thickening (48%) and/or turbinate loss (44%). In a previous study of dogs with grass seed foreign bodies (including 17 nasal cases), exudate was noted in the nasal cavity in 88% of cases, localized turbinate destruction in 24% of cases, and the nose appeared normal in 6% of cases.15

In our study, when acute and chronic foreign bodies were compared, only the presence of turbinate destruction (P = 0.021) and mucosal thickening (P = 0.014) were indicators of chronicity. On multivariable analysis, only mucosal thickening was associated with chronic cases. This is likely because all the cases with turbinate loss also had mucosal thickening, but not vice versa. Turbinate destruction has been reported in cases of chronic nasal disease such as fungal rhinitis in dogs and cats, chronic non-specific rhinitis (mainly in cats), chronic bacterial rhinitis, and nasal neoplasia.1,8,9,10,11 The presence of concurrent aspergillosis and a nasal foreign body has also been previously described.8,10 A chronic nasal foreign body should be considered for all CT studies demonstrating unilateral turbinate destruction and mucosal thickening, in addition to a compatible clinical history and clinical signs. Given the similarities with localized nasal aspergillosis, a chronic foreign body rhinitis may be included as a differential in cases where localized turbinate destruction, mucosal thickening and absence of sinonasal involvement are noted.8 In our study, the duration of the clinical signs did not affect the visibility of the nasal foreign body on CT.

The use of MPRs and different display parameters was useful in just over half of the cases in this study (54,5%), with varied opinions as to the value of these amongst the readers. Unfortunately, this large variability and the small number of cases prevented statistical analysis of this data. Previous studies have found the use of multiplanar reconstructions and different display parameters helpful in identifying various different types of foreign bodies.13,18,19 It is therefore likely that the use of MPRs and multiple display parameters would also be useful for cases of nasal foreign bodies. When available, the post contrast series were not considered to add any additional information regarding the presence of a nasal foreign body. In previous studies, post contrast series have provided valuable information highlighting cavitated lesions or draining tracts associated to the presence of foreign bodies in other parts of the body.14,15,17,18 The authors consider that the lack of additional information provided by post contrast series in this study could be because abscessation and sinus tract formation were not observed in our cases.

Nasal foreign bodies were noted in dogs and cats of any age and breed. Working dogs (such as Spaniel and Retriever breeds) were common breeds in this study, consistent with previous reports of migrating foreign bodies.15,17 A foreign body was more likely to be identified in cats than in dogs and in heavier patients.

There are some limitations of this study, which are related to the study design. As mentioned, the images were reviewed with knowledge of the presence of a foreign body within one of the nasal passages, and therefore the usefulness of CT may have been overestimated. We tried to overcome this bias by classifying cases as positive only when a foreign body was clearly visible or strongly suspected. The case selection (only cases confirmed with rhinoscopy) could also have resulted in overestimation of the usefulness of CT, because cases where a nasal foreign body was present but not found with rhinoscopy would not have been included in the study. The lack of control cases made calculation of the sensitivity and specificity of CT compared with rhinoscopy not possible. The lack of control cases also prevented analysis of other possible signs associated with the presence of a foreign body, such as the unilateral distribution of the changes or the presence of fluid accumulation.

The small sample size is also another significant limitation and prevented the statistical analysis of other changes; for example, the definitive changes associated with the presence of a foreign body, or the possible association of determined CT characteristics to different types of foreign bodies. The small number of cases also prevented the statistical analysis of the different acquisition parameters (such as slice thickness) and the value of the post contrast sequences. Further studies with a larger number of cases would be required for further investigation of this.

In conclusion, CT may be useful regarding the diagnosis of nasal foreign bodies in dogs and cats, with rhinoscopy remaining the gold standard for a definitive diagnosis. In our study, most of the identified foreign bodies were linear and showed variable attenuation values, including a “tubular-like appearance”, which were independent of their nature. Additional CT changes within the nasal cavities were present in most studies. Mucosal thickening and turbinate loss were most commonly observed in cases with chronic nasal foreign bodies.

**List of author contributions**

Category 1

(a) Conception and Design: Moreno-Aguado B, Carrera I, Trevail T.

(b) Acquisition of Data: Moreno-Aguado B, Carrera I, HoldsworthA, Agthe P.

(c) Analysis and Interpretation of Data: Moreno-Aguado B, Carrera I, Maddox T.

Category 2

(a) Drafting the Article: Moreno-Aguado B.

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Category 3

(a) Final Approval of the Completed Article: Moreno-Aguado B, Carrera I, HoldsworthA, Agthe P, Maddox T, Trevail T.

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**Tables and Graphs**

**Table 1**. Nature of the foreign bodies in relation to their CT visibility and appearance.

**Table 2**. Additional CT nasal changes present in acute and chronic nasal foreign bodies.

**Graph 1**. Box plot showing increasing weight associated with increased odds of detection (P= 0.049).

**Figures**

Figure 1. Sagittal (A) and transverse (B) non-contrast CT images (window level 50 HU, window width 350 HU) showing a well-defined linear foreign body within the left nasal cavity. The foreign body is characterized by a hyperattenuating rim (approximately 60HU) surrounding a fluid attenuating centre (9HU), creating a “tubular-like appearance” (arrow). A wooden stick fragment was retrieved with rhinoscopy.

Figure 2. A, transverse, B, sagittal, C, dorsal, non-contrast CT images (window level 50HU, window width 350HU) showing a well-defined, unilateral, fairly homogeneous soft tissue attenuating lesion (approximately 40-60HU) within the right nasal cavity. This lesion was classified as suspicious. A grass blade was retrieved with rhinoscopy.

Figure 3. Transverse (A), sagittal (B), and dorsal (C) non-contrast CT images (window level 300 HU, window width 1500 HU) showing an irregular and heterogeneous lesion within the right nasal cavity (arrows), which has a mixture of soft tissue attenuating areas and small gas bubbles. This lesion was classified as being suspicious of a foreign body. Conifer plant material was retrieved with rhinoscopy.

Figure 4. Transverse (A) and dorsal (B) non-contrast CT images (window level 50 HU, window width 350 HU) showing a well-defined linear foreign body within the right nasal cavity, which had an attenuation of approximately 100 to 150 HU. A grass seed was retrieved with rhinoscopy.

Figure 5. Transverse non-contrast CT images (window level 50 HU, window width 350 HU) of the nasal cavity from two different patients. Image A is from a patient with an acute nasal foreign body (a grass blade, present for 1 week) and shows a small focal accumulation of fluid to soft tissue attenuating material (20-50HU) (arrow). Image B is from a patient with a chronic nasal foreign body (non-specific plant material, present for 2 months) and shows moderate fluid to soft tissue material accumulation (7-45HU) (arrow) and moderate turbinate destruction (\*). The remaining visible turbinates have a blunted, irregular and thickened appearance.