

## Extraction of an incisor embedded within the nasal cavity in two guinea pigs

Nobuhide KIDO<sup>1,2)\*</sup>, Kaori ONO<sup>1)</sup>, Tomoko OMIYA<sup>1,2)</sup>, Yukio OGUCHI<sup>3)</sup>, Moemi SETOGAWA<sup>3)</sup> and Yuuki MACHIDA<sup>3)</sup>

<sup>1)</sup>Nogeyama Zoological Gardens, Yokohama Greenery Foundation, 63-10, Oimatsu-cho, Nishi-ku, Yokohama 220-0032, Japan

<sup>2)</sup>Kanazawa Zoological Gardens, Yokohama Greenery Foundation, 5-15-1, Kamariya-higashi, Kanazawa-ku, Yokohama 236-0042, Japan

<sup>3)</sup>Makigahara Children Zoo, Harmony Center Public Interest Incorporated Foundation, 65-1, Oike-machi, Asahi-ku, Yokohama 241-0834, Japan

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**ABSTRACT.** Oral examination of two guinea pigs revealed that the unilateral incisor was absent. On radiographic examination, the incisor was identified within the nasal cavity in both patients. Under anesthesia in both patients, the skin was incised from the nostril to 1.5 cm proximal, and the premaxilla and part of the maxilla were exposed. The bone was removed using a surgical drill, and the incisor was exposed in the nasal cavity. The root was grasped with forceps and carefully extracted as it was degraded and very fragile. Diagnosis was easy using oral and radiographic examination. In guinea pig patients where an incisor is absent on oral examination, this condition should be considered.

**KEY WORDS:** guinea pig, incisor, nasal cavity, radiography, tooth extraction

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A 2-year-old, female guinea pig (Case 1) was identified with a missing left maxillary incisor during a routine health examination at Makigahara Children's Zoo (Yokohama, Japan), where guinea pigs are maintained for handling by patrons. The patient did not exhibit any clinical signs of illness. We surmised that the left incisor crown was fractured and expected the tooth to regrow in the near future. One year later, a tooth-like tissue measuring 2 mm was discovered in the left nostril (Fig. 1). The odor of pus was detected from the nose, although no visible discharge was present. The remaining teeth were normal on intraoral examination. Radiographic examination revealed that the left incisor was inside the nasal cavity and protruding from the left nostril.

Extraction of the incisor was required. The patient was administered 0.4 ml of intramuscular antiplasmin (Vasolamin Injection, Meiji Seika Pharma Co., Ltd., Tokyo, Japan) and lactated ringer's solution (Solulact, Terumo Co., Tokyo, Japan) through the cephalic vein during anesthesia. The patient was anesthetized by isoflurane (Escain, Mylan Co., Osaka, Japan) inhalation delivered through an oral mask adjacent to the nose and mouth. We attempted to remove the protruding incisor from the nostril, but the tooth was fractured and only a small piece could be retrieved. Subsequently, the skin was incised from the nostril to 1.5 cm proximal, and the premaxilla and part of the left maxilla were exposed. The bone was removed using a surgical drill (Osada success 40 M, Osada Inc., Tokyo, Japan), and the incisor and periapical

lesion were exposed in the nasal cavity after removing the surrounding tissue (Fig. 2). The incisor root was grasped with forceps and carefully extracted, because it was partially decomposed and very fragile. The remaining incisor was removed through the nostril. After extraction, the subcutaneous tissue and skin were closed in a single interrupted pattern using a monofilament absorbable suture (Maxon 4-0, Covidien Japan Co., Tokyo, Japan). After surgery, 5 mg of enrofloxacin (Baytril, Bayer holding Ltd., Tokyo, Japan) was subcutaneously administered once daily for 1 week. The patient initially did not exhibit any clinical abnormality, but 2 months later, the odor of pus was again detected from the nostril, with no discharge. Oral enrofloxacin (5 mg) was prescribed again for 1 month, and the odor disappeared. No clinical abnormalities were found 6 months after surgery.

Case 2 was a 2-year-old, female guinea pig with a missing right maxillary incisor. Because the cause of the tooth loss was unclear, a radiograph was obtained, which revealed that the right incisor was embedded in the right nasal cavity (Fig. 3). Therefore, surgical extraction of the tooth was required. Before anesthesia, the patient was administered 0.4 ml of intramuscular antiplasmin (Vasolamin Injection) and anesthetized in the same manner as described for Case 1. The displaced incisor was exposed, and the root was gently grasped with forceps and extracted, as described above for Case 1. After surgery, the patient was administered 5 mg of subcutaneous enrofloxacin for 1 week. No clinical abnormalities were noted during 5 months after surgery.

Thus, a unilateral incisor was found embedded in the nasal cavity in two guinea pigs. The absence of the incisor was identified in both cases by intraoral examination, and in Case 1, the tooth was observed to protrude from the nostril. Radiographic examination revealed that the incisor was embedded in the nasal cavity, indicating that this disorder can be easily diagnosed by clinical and radiographic examination.

Dental disease is one of the most common conditions in

\*CORRESPONDENCE TO: KIDO, N., Kanazawa Zoological Gardens, Yokohama Greenery Foundation, 5-15-1, Kamariya-higashi, Kanazawa-ku, Yokohama 236-0042, Japan. e-mail: kido@hama-midorinokyokai.or.jp

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Fig. 1. Case 1: A 2-year-old female guinea pig. Approximately 2 mm of the left maxillary incisor protruded from the left nostril.

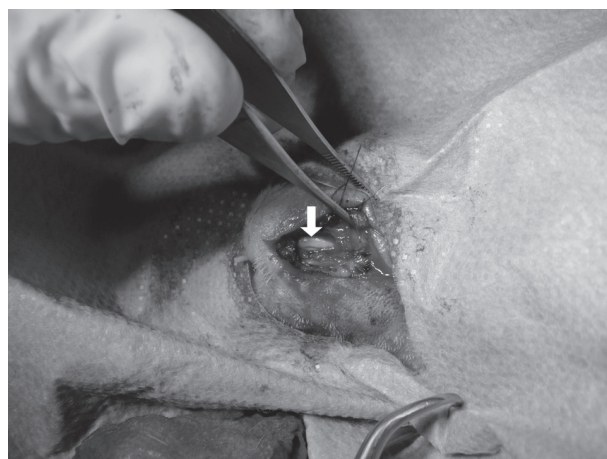


Fig. 2. Case 1: The incisor in the nasal cavity was exposed (arrow).

guinea pigs, and numerous diagnostic and treatment methods associated with rabbit dentistry have been reported [3, 5, 6]. The most common dental disorders in guinea pig are obliquely worn incisors, macrodontia, tooth fracture, bridge formation of the lower premolars and mandibular swelling due to retrograde growth of the cheek teeth [3, 5]. In addition, a case of an odontogenic retromasseteric abscess was recently reported [1]. However, the number of reported cases involving guinea pigs is limited. Although cases similar to that in the present report may be known but not widely reported, to our knowledge, the current report is the first known case report describing displacement of the incisor into the nasal cavity of a guinea pig. Therefore, this report may help in providing new diagnostic and treatment information with regard to incisor abnormalities in guinea pigs.

Surgical exposure of the incisor within the nasal cavity may be required for tooth extraction in such cases. The incisor is typically extracted by separating the gingiva and tooth root and removing it from the oral cavity [3]. However, the incisor in the nasal cavity was degraded and fragile in both cases, and in Case 1, extraction through the nostril was impossible. Therefore, removal of the premaxilla and part of the maxilla using a surgical drill was required to expose the incisor root. However, this treatment method can damage the nasal cavity and result in hyperplasia of connective tissue in the future. Potentially, breathing may be prevented by unilateral nasal obstruction. Therefore, the prognosis of both patients warrants great consideration.

In Case 1, the odor of pus was detected from the nasal cavity before and 2 months after surgery, and the incisor was degraded and fragile at the time of surgery. This suggests the occurrence of infection in the nasal cavity and incisor; however, bacterial culture was not performed. Although periodontitis or dental pulp exposure was considered a cause of the infection, the exact cause remains unclear. In any case, the incisor exposed in the nasal cavity may be infected beforehand and can spread the infection in the nasal cavity.



Fig. 3. Case 2: A 2-year-old female guinea pig: Radiographic examination revealed that the incisor was embedded within the nasal cavity (arrowheads).

The condition of guinea pigs may worsen because of this infection, unless the lesion is treated. Therefore, incisors in the nasal cavity should be extracted. In the present study, the infectious lesion in the nasal cavity was not debrided during surgery. Therefore, the infection was not completely treated and resulted in recurrence of symptoms 2 months after surgery. Debridement is therefore necessary during treatment. In Case 2, no apparent infection was detected during surgery; furthermore, the patient did not exhibit any abnormality after surgery, suggesting that early diagnosis and treatment may have been important in this case. Infection was one of the key factors in the present study, indicating that bacterial culture should be performed in such cases.

In the present case report, the cause of incisor displacement was unclear. Incisors in guinea pig are elodont (long

crown) and aradicular hypsodont teeth that continuously grow and erupt without anatomic roots, and they are present at birth [2, 4]. In the present report, the guinea pigs did not exhibit any dental abnormalities in an examination conducted a year back; therefore, the disorder may not be congenital. In rabbits and guinea pigs, excessive coronal elongation of the cheek teeth is common, and this elongation contributes to periapical infection [3]. However, the incisor was not extended in the periapical direction in our guinea pigs; rather, it was extended in the normal direction, although it was in the nasal cavity. Therefore, their condition was not related to abnormal elongation and was probably caused by displacement. One potential cause could be accidental trauma to the incisor and fracture of the tooth crown, considering that both animals were handled by many patrons every day. The tooth could have subsequently been buried in the nasal cavity.

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