

Fungal frontal sinusitis in a dog

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Abstract : A 6-year-old male Basset hound weighing 9.3 kg was presented with a history of severe mucopurulent discharge from the bilateral fronto-nasal area which had been developed progressively over 1 year. At admission, the physical state and appetite of the patient was poor. There was bilateral thick and mucopurulent discharge on the fronto-orbital area with fistula opening in the skin over the frontal bone. A sample of exudate was cultured and fungi were isolated. Radiographically, there was an increased diffuse opacity of the frontal sinus with decreased definition and a thickening of the mucous membrane lining the sinus. This case was finally diagnosed as chronic fungal frontal sinusitis. After surgical obliteration of the sinus, local and systemic antifungal therapy with chlorhexidine and ketoconazole were applied. The dog had gradually recovered the physical state and appetite.

Key words : basset hound, severe mucopurulent discharge, fronto-orbital area, chronic fungal frontal sinusitis.

Introduction

Frontal sinusitis has been associated with mechanical injury such as dehorning^{1,2}, bite wound³ and neoplasm⁴, or caused by bacteria, fungi, virus, and allergens. Surgical treatments have included trephination, obliteration, and ablation of the sinus⁵. Three osteoplastic techniques of sinus obliteration have been used: (1) osteoplasty without exogenous

material⁵; (2) osteoplasty with exogenous material; (3) osteoplasty with endogenous fat. The most common clinical signs include anorexia, lethargy, fever, frontal bone distortion, exophthalmos, abnormal posture, nasal discharge, and neurologic abnormalities. Several cases of frontal sinusitis were reported in cats⁶⁻⁸, but were rare in dogs.

In this paper, a case of fungal frontal sinusitis in a Basset hound is described. We also introduce process of diagnosis, surgical methods, and antifungal therapy.

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Case history

A 6-year-old male Basset hound weighing 9.3 kg was presented to Veterinary Medical Teaching Hospital, Kyungpook National University with a history of severe mucopurulent discharge from the bilateral fronto-nasal area which had been developed progressively over 1 year. Before admission to our hospital, the animal had been treated with penicillin at a local animal clinic. When antibiotic therapy was stopped, purulent discharge from the frontal sinus reappeared continuously.

At admission, the physical state and appetite of the patient was poor. Rectal temperature(39.8°C) and respiratory rate(48 breaths/min) were high, but heart rate(66 beats/min) was normal. In physical examination, there was bilateral thick and mucopurulent discharge from the fronto-orbital area with fistula opening in the skin over the frontal bone. The cause of the fungal sinusitis in this dog was not found. There was no history of trauma and any other mechanical injuries.

A sample of exudate was aspirated from the frontal sinus and cultured in Sabouraud dextrose Agar for 3 days at 25°C. *Aspergilli* spp were identified by microscopic examination.

Hematology(WBC, RBC, PCV) and serum chemistry(AST, ALT, BUN, Creatinine, Total protein, CPK) were monitored before therapy. Especially, CPK value was high (Table 1).

Radiograph of the skull was obtained. There was an increased diffuse opacity of the frontal sinus with decreased definition and a thickening of the mucous membrane lining the sinus (Fig 1).

Surgical procedures

The dog was premedicated with atropine. Anesthesia was induced by intravenous injection of thiopental sodium(10 mg/kg) and maintained with inhalation of enflurane and oxygen. The dog was positioned in ventral recumbency, and the head was secured on a elastic bandage. Then, a midline skin incision was made over the frontal bone. The skin was reflected bilaterally to expose the outer table of the frontal bone. The periosteum was incised longitudinally on a line directly beneath the skin incision, and reflected to allow the bone to be cut on that line with a oscillating bone saw. Bone incisions were made on rectangular shape over the frontal and ethmoturbinates bones ; two incisions were parallel to the midline longitudinally and two incisions were made transversely and completed cutting the bone flap(Fig 2). The medial septum of the sinus was cut with an osteotome. The sinus contained fetid, tenacious and mucopurulent pus, and the mucous membrane was thickened slightly. After mucopurulent material was aspirated from the sinus, the mucous membrane and the periosteum of the sinus were removed with a periosteal elevator and a bone burr(Fig 3). Those on the inner side of the bone flap were also included. After the mucous membrane removal, the area was flushed with saline solution. The bone flap was replaced and the periosteum and subcutaneous fascia were closed with absorbable suture material. A drainage tube was inserted through the skin and frontal bone into the right and left frontal sinuses. The skin was closed with 3-0 nylon. The tube was secured to the animal's forehead(Fig 4).

After surgery, local antifungal treatment was started with douches twice a day of the sinusal cavity with 1% econazole solution and chlorhexidine. Systemically, ketoconazole was administered orally twice a day. Appetite was gradually

Table 1. Hematology and serum chemistry of a Basset hound affected by frontal sinusitis

WBC	11.95 × 10 ³ /μl	ALT	31(IU/L)
RBC	6.67 × 10 ⁶ /μl	BUN	14(mg/dl)
PCV	35.5(%)	Creatinine	1.1(mg/dl)
PLT	624 × 10 ³ /μl	Total protein	8.3(g/dl)
AST	25(IU/L)	CPK	328(IU/L)

better.

Discussion

Frontal sinusitis is rare in small animal practice. Some fungal frontal sinusitis have been reported in cats, but rare in dogs^{6,9}. This patient was misdiagnosed as cellulitis at first time because the frontal area had been identified a swelling and discharge from the skin. Several antibiotics had been administered for over 1 year. During antibiotic therapy combined with flushing and drainage solution, the discharge was mitigated, but increased again when the treatment was stopped. At admission to our hospital, definitive diagnosis was made by mycological and radiological examination. It is likely to misdiagnosed frontal sinusitis as cellulitis because defects were developed and suppurative content of the sinus was discharged from the skin over the frontal bone. Chemical profiles of blood and serum were not helpful as diagnostic tools. All values were in normal ranges except CPK level which was increased in muscle inflammation, hy-

pokalemia and trauma¹⁰. In this case, it was assumed that prolonged intramuscular injections with antibiotics increase CPK value. Paul *et al*¹¹ used for the diagnosis of sinusitis prior to development of external lesions or clinical signs through infrared thermography. Fungal sinusitis in a cat has been reported to cause frontal bone thickening and lysis⁶. It was proved by ultrasound and computed tomography. In early stage of frontal sinusitis, infrared thermography and computed tomography may be helpful to diagnose¹².

The primary factor for success of the surgical procedure is the complete removal of the mucous membrane in the frontal sinus and the obstruction of the nasofrontal duct. Potential complication include frontal bossing and compression. The frontal bone had to be incised properly not to lacerate the dura mater and even the cerebral cortex⁸. Recurrent or persistent infection in the sinus could result from incomplete removal of the mucous membrane or from ascending infection through a potent nasofrontal duct from the nasal passage.

Legends for figures

Fig 1. Lateral radiographic view of skull increased diffuse opacity of the frontal sinus with decreased definition.

Fig 2. Bone incisions with oscillating bone saw on rectangular shape over the frontal and ethmoturbinates bones.

Fig 3. Removal of the mucous membrane and periosteum of the sinus with a periosteal elevator and a bone burr.

Fig 4. Intubation into the frontal sinus and skin closure.

Fig 1.

Fig 2.

Fig 3.

Fig 4.

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개의 진균성 전두동염

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국문초록 : 9.3kg의 6년령인 수컷 바셋하운드가 1년 이상 진행된 양측성 전두부위로부터 심한 점액화농성 분비물의 병력을 나타내었다. 내원당시 환측의 신체상태와 식욕은 불량하였다. 전두골위 피부에 형성된 누공으로부터 농성 삼출물이 양측성으로 분비되었다. 삼출물 시료를 배양하여 진균을 분리하였다. 방사선 검사에서는 전두동의 경계가 불분명하고 두꺼운 점액성막으로 덮여 있었으며 전두동의 혼탁도가 미만성으로 증가되어 있었다. 최종적으로 만성 진균성 전두동염으로 진단하였다. 전두동의 외과적 제거후 국소와 전신성 항진균요법으로 Chlorhexidine과 Ketoconazole을 적용하였다. 환측은 점진적으로 건강과 식욕을 회복하였다.

Key words : basset hound, severe mucopurulent discharge, fronto-orbital area, chronic fungal frontal sinusitis.