

Deflation Treatment for Subcutaneous Emphysema in a Goffin Cockatoo (*Cacatua goffini*)

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Abstract : A 1-year-old Goffin cockatoo (*Cacatua goffini*) presented a soft non-painful and balloon-like mass around the cervical area. Subcutaneous emphysema due to cervicocephalic air sac trauma was diagnosed based on history and physical examination, and was confirmed by radiographic examination. Because the cutaneous tab was unsuccessful, a modified syringe stent was carried out. The bird showed no adverse signs for two weeks after implantation. After surgical removal of the stent, the bird did not reveal subcutaneous emphysema.

Key words : bird, Goffin cockatoo (*Cacatua goffini*), subcutaneous emphysema.

Introduction

Subcutaneous emphysema occurs when air sacs are ruptured by any of numerous underlying causes. When air leaks from the affected air sacs, it fills the subcutaneous space and the skin expands around the area. The avian air sac system is divided into the pharyngeal-tracheal, cervicocephalic, and pulmonary air sac systems (4). The cervicocephalic and pulmonary (abdominal or caudal thoracic) air sacs are most commonly involved (6,7). The cervicocephalic air sacs are not connected to the pulmonary air sacs or lung, and are only associated with the intraorbital sinus (7). Air sac rupture may cause focal subcutaneous emphysema, which usually occurs in the head, dorsal cervical region, and flank (4). It is commonly observed in Amazon parrots, macaws, and cockatiels (4). Common causes of subcutaneous emphysema in birds include trauma, lung or air sac inflammation associated with infectious agents, and nutritional deficiencies (4,7). Although subcutaneous emphysema is not an emergency condition, an affected bird could feel discomfort and adverse effects, such as decreased activity and appetite or immune suppression, could be induced. In severe cases, subcutaneous emphysema could be life threatening (6).

In this case report, we describe the clinical findings, results of diagnostic tests, and deflation treatment using a modified syringe (1 ml) stent in a 1-year-old Goffin cockatoo with subcutaneous emphysema which originated from the cervicocephalic air sacs.

Case

A 1-year-old Goffin cockatoo (*Cacatua goffini*) presented

with a soft, non-painful, non-feverish mass involving the entire cervical region. The owner stated that the bird fell down a tree the previous day. The mass was near the head and was spread over the neck. The bird showed decreased appetite and vocalization. During the physical examination, the bird was alert and revealed abnormal posture. The neck was extended, head was bent back and the wings were held away from the body. No other abnormalities were observed. Blood profiles and full body radiographs were performed. The blood profiles were normal. Subcutaneous emphysema was diagnosed based on the history and physical examination, and was confirmed by radiographic examination (Fig 1A and 1B). As the patient appeared to have discomfort and depression, multiple cutaneous tabs were made with a syringe and hypodermic needle to reduce air. However, the subcutaneous swelling recurred immediately after and the initial treatment was unsuccessful. Therefore, a stent placement was necessary. A stent modified with a 1 ml syringe (Fig 2A) was placed to resolve the condition instead of a Teflon stent (TEFLON dermal stent; McAllister Technical Services, Coeur d'Alene, USA) (4,5,6). The bird was administered enrofloxacin (10 mg/kg, intramuscular, Baytril[®], Bayer Korea Corp., Korea) and buprenorphine (0.04 mg/kg, intramuscular; Bunol amp., Hanlim Pharm., Korea), and was allowed to rest in a dark room with oxygen before the surgical procedure. The bird was anesthetized with 2% isoflurane (Forane sol., Choongwae Pharm., Korea) in oxygen administered at a flow rate of 1.5 L/min through a face mask connected to a non-breathing circuit as needed. The incised skin was prepared using a chlorhexidine swab to minimize opportunistic infections. An one-centimeter incision was made through the skin at the proximal cervical region to lessen self injury by the bird. Two 3-0 non absorbable sutures were placed in two pairs of predrilled holes at the distal part of the syringe and the stent was affixed against the subcutaneous surface (Fig 2B). The bird recovered anesthesia

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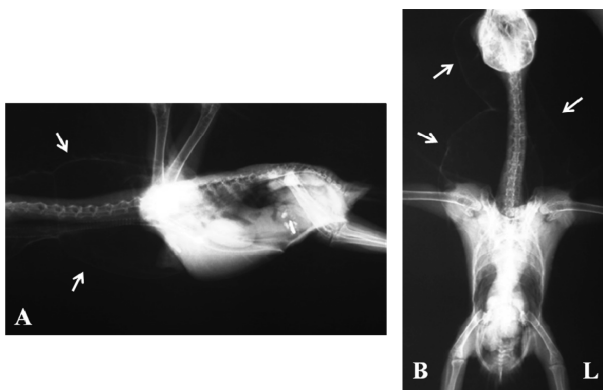


Fig 1. Subcutaneous emphysema in a Goffin cockatoo. Extended skin margin and air opacity between the cervical wall and the skin margin are observed (arrows). No other abnormal remarks are observed. A: Right lateral view. B: Ventro-dorsal view.

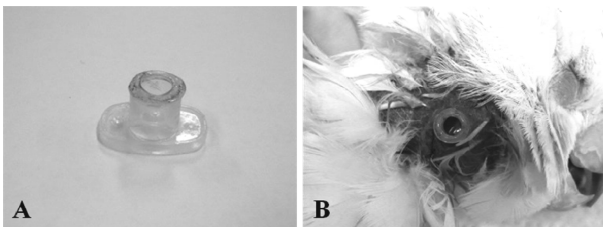


Fig 2. A: A modified syringe stent. A stent is made with a 1 ml syringe. Cut the distal part of a 1 ml syringe body and drilled the two pairs of holes at the end of the syringe body oppositely. B: A stent is placed at the right cervical region.

safely, and a collar was not needed after the procedure. Enrofloxacin (5 mg/kg, twice a day orally; Baytril®, Bayer Korea Corp., Korea) and meloxicam (0.1 mg/kg, one a day orally; Metacam®, Boehringer Ingelheim, Germany) were initiated to prevent opportunistic infection and to relieve the pain. The bird did not show any other complications while the stent was placed for two weeks. After surgical removal of the stent, the bird did not reveal recurrent subcutaneous emphysema.

Discussion

Subcutaneous emphysema could be distinguished from other lesions by its characteristics (non-painful, non-feverish, and balloon-like on palpation) and it is easily diagnosed with fine needle aspiration (4). Air removal by a syringe and hypodermic needle reduced emphysematous lesions. However, identification of underlying causes is necessary to provide proper treatment. This condition could reoccur or worsen if the air is removed repeatedly without correcting the primary underlying cause (3). Subcutaneous emphysema is induced by numerous etiologic causes, including trauma, inflammation, infection, and nutritional deficiencies (4,7). In this bird, trauma was indicated as a major cause of subcutaneous emphysema based on its history. Other causes were ruled out thorough blood profiles and radiographic examinations. Differential diagnoses of trauma

showed skeletal damage affecting the cervicocephalic air sac system and cervical wall and cervicocephalic air sac damage. Radiographs revealed subcutaneous emphysema evidenced by the presence of air opacity between the cervical wall and the skin margin on the generalized cervical region. However, no bone fracture was observed. When abnormal findings are observed in blood profiles or radiographs, protein electrophoresis or bronchial and air sac endoscopy could be indicated for differential diagnosis (4).

Subcutaneous emphysema is generally treated by physical tapping and draining air with a syringe and hypodermic needle from emphysematous lesions. Openings or fistulae in the skin could be used if it is not resolved quickly (1,4,5,6). Currently, the commercial Teflon stent is clinically applied in avian medicine. In this case, a stent made with a modified syringe (1 ml) was used instead of the commercial Teflon stent.

The main postoperative problem with the Teflon stent is the transient occlusion of the stent opening by underlying tissue and debris (2). Subcutaneous emphysema could reoccur as the opening becomes occluded due to the neglect of continuously cleaning the opening. Therefore, the Teflon stent requires effort to prevent occlusion of the opening (6). Similarly, an opening of the modified syringe stent applied in this case was also partially occluded by debris. However, no emphysematous lesion recurred during the stent implantation and the bird's clinical signs were dramatically improved. No complication was observed and the owner was satisfied with the surgical correction and outcome.

A case of subcutaneous emphysema due to trauma in a goffin cockatoo was diagnosed based on history, physical examination, and radiographic examination and the condition was corrected with a modified syringe (1 ml) stent implant. The modified syringe stent produced similar effects compared with a commercial Teflon stent. Therefore, a modified syringe stent can be applied when a commercial stent is unavailable.

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피하 기종에 이환된 고핀 앵무새(*Goffin Cockatoo, Cacatua Goffini*)에서의 디플레이션 처치

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요 약 : 1살령 Goffin cockatoo (*Cacatua goffini*)가 경부 주변의 부드러운 무통성의 풍선 모양 종괴를 주증으로 내원하였다. 문진과 신체 검사를 통해 두경부 기낭의 외상에 의한 피하 기종으로 진단하였으며, 이를 방사선 검사로 확인하였다. 피하 탭이 성공적이지 못하여, 변경된 시린지를 이용한 스텐트를 장착하였다. 장착 2주 간 부작용은 나타나지 않았으며 스텐트의 수술적 제거 후, 피하 기종은 소실되었다.

주요어 : 새, 고핀 앵무새, 피하 기종