

Feather picking and self-mutilation in psittacine birds

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Feather picking and self-mutilation patients are challenging to treat and are most likely to respond if therapy is initiated soon after the behavior is exhibited. The best results are obtained by identifying and removing (when possible) the cause of conflict, enhancing the environment, improving management, using appropriate drugs when indicated, and employing counter-conditioning. Conflicts are identified by obtaining a thorough history, documenting the owner's observations, and surveying the patterns of feather picking or self-mutilation. Enhancement of the environment and management include: placing the bird outdoors during the day in a large flight cage, providing unrestricted spaces indoors, supplying an improved, more natural diet, and obedience training. Drugs that may act as adjuncts to treatment include dopamine antagonists and opiate-receptor blockers, tricyclic antidepressants, benzodiazepines, anxiolytics, and in some cases, hormone therapy. Collars and bandages are indicated in situations where the bird's life is threatened. Desensitization and counter-conditioning are indicated in cases where the causative conflict may not be removed.

"... the patient is impelled to perform actions which not only afford him no pleasure but from which he is powerless to desist." (Sigmund Freud on compulsive behavior) [1].

Feather picking and self-mutilation in psittacine birds is a significant problem. In this article, feather picking is defined as a stereotypic behavior or obsessive compulsive disorder (OCD). Stereotypic behavior is defined as acts that are repetitive, constant, and appear to serve no obvious purpose [2]. This definition is not entirely accurate. Stereotypies may have some variation; in fact, many may develop or progress from normal behaviors. The degrees of feather picking that are observed support this development. The range, from normal preening to mild and localized feather plucking to generalized feather plucking, all stems from innate preening behavior. Some stereotypic behaviors may (as in the case of masturbation) have an obvious purpose. OCD is when a preoccupation to repetitively perform certain acts or carry out certain rituals morbidly dominates the mind. This definition may better describe some cases of feather picking. For the sake of simplicity, however, the terms stereotypic behavior or stereotypies are used to describe these behaviors.

Stereotypies may be genetic (having an inherited influence or species predilection), or acquired (infection, physical trauma, toxins); however, most are experiential (in the form of reactive abnormal). An inappropriate environment and or management creates conflict with species-typical behaviors characteristic to the animal. Conflict results from a high level of arousal and the inability to perform the appropriate behavior to satisfy the increased stimulation. More specifically, conflict may be induced by the absence of releasing stimuli or target objects. The parrot may then redirect behaviors (i.e., redirect social behaviors toward their owners), engage in vacuum activities (e.g., fly chasing, star gazing), or develop neurotic behaviors (eg, feather picking, self-mutilation).

The most severe stereotypic behavior is self-mutilation. Self-mutilation is common in psittacine birds and its treatment is often unrewarding. In man, self-mutilation behavior has been defined as “A low lethality, socially unacceptable self-injury performed in reaction to psychological crisis” [3]. This is likely an accurate definition for feather picking and self-mutilation in psittacine birds as well. It may seem odd to look to the behavior of self-mutilation in man to find answers to feather picking and self-mutilation in psittacines. There is a surprising similarity, however, as there is with similar behaviors in other animals.

Stereotypies are most often abnormal expressions of normal species-typical behavior. This has led stereotypes to be classified according to the normal patterns from which they are derived [4]. In the psittacine these may include the following categories: grooming (feather picking or feather mutilation, nail chewing, etc.), hallucinatory (fly hazing, star gazing), eating and drinking (polydipsia, pica, etc.), locomotory (pacing, circling, rocking, dancing, digging the cage floor), vocalization (screaming or crying), and neurotic (self-mutilation, aggressive behavior). Other stereotypic behaviors of birds that are more difficult to classify may include paper shredding, which may be classified as nesting, along with beak knocking, and others. Feather picking is often presented to the veterinarian; however, it may or may not be the most common stereotypic behavior of psittacines.

Cause of stereotypies

Genetic behavior: inherited influence and species predilection

The cause of stereotypies may be a complex mixture of physiologic and experiential influences. The idea of an inherited influence is very believable. A strong predisposition to feather picking and self-mutilation is seen among specific species of psittacines. Species that have a high predisposition to feather pick include Timneh African Gray Parrots (TAG) and Congo African Gray Parrots (CAG), Lovebirds, Eclectus parrots, Cockatoos (especially Moluccan, Goffin, Bare-eyed species), Conures, Parrotlets, Monk parakeets, mini-macaws, and to a lesser extent large macaws. Patterns of picking also seem to follow species profiles. CAG typically pick a ring of feathers around their necks and then move down their chests (Fig. 1). Large species of macaws (Fig. 2), most commonly blue and gold macaws, start pulling feathers from their legs and move to their chests, backs, and wing coverts. Self-mutilation is common in Moluccan (Fig. 3) and Goffin Cockatoos (chest, neck, and leg mutilation and toe chewing or amputation), Monk parakeets (neck and chest) and Blue and Gold Macaws (head and neck scratching).

Acquired behavior: infection, trauma, toxins

Some abnormal behaviors are thought to be acquired through infection, trauma, or toxicity. This may be the case with feather picking as well. It is not uncommon to find Old World psittacines infected with polyomavirus or circovirus that feather pick. This behavior may be owing to irritation or inflammation in the skin or feather follicle or it may be associated with changes in the bird's central nervous system caused by these viral diseases. Rabies causes abnormal behaviors in many mammals that it infects. This may be true for psittacine birds. Zinc toxicity has been proposed as a cause of feather picking, but it has not been confirmed.

Experiential causes of abnormal behavior

Most stereotypic behaviors are believed to be experiential, in the form of reactive abnormal behaviors. Inappropriate environment or management create conflict with species-typical behaviors characteristic to the animal. These behaviors may be influenced by early experiences and conditioning. Captive bred and incubator-hatched chicks are deprived of a large portion of their natural early socialization. The constant parental contact while still in the nest, interaction with siblings, and con-specifics are all absent when a chick is not parent-hatched and raised. The



Figure 1. Congo African Gray Parrots (*Psittacidae*, CAG) typically pick a ring of feathers around their necks and then move down their chests. (A) A CAG with a 1-week history of feather picking. (B) A CAG with a 1-month history of feather picking.

normal nestling stages of protection, observation, and exploration are also absent. These early experiences (inadequate socialization and psychological trauma) may play a significant role in the development of stereotypies later in life. Reactive abnormal experiences (inadequate environment or behavior carried over from a previous inadequate environment) and conditioned abnormal experiences (abnormal behavior in response to a reward or carried over



Figure 2. Large species of macaws often pull feathers from their legs and move to their chests, backs, and wing coverts. This Scarlet Macaw has been feather picking for several years.

from a previous learning process, such as attention given to screaming) all may contribute to feather picking in psittacines.

Conflict may result from a high level of arousal and the inability to perform the appropriate behavior to achieve de-arousal. More specifically, conflict may be induced by the absence of releasing stimuli or target objects. Examples may include the absence of a social partner or inability to perform normal nesting or food gathering behavior. Without appropriate releasing stimuli, a parrot may redirect behaviors (toward their owners), engage in vacuum activities (fly chasing, star gazing), or develop neurotic behaviors (feather picking, self-mutilation).

Conflict may result from physical restraint of a normal motor pattern, from a change in normal social patterns, or from an unstable social order. Studies of stereotypies and self-mutilation in mammals in zoos, circuses, and laboratories has shown a strong influence from non-feral upbringing, prolonged isolation, and confinement. Studies of monkeys show that animals reared with limited peer contact had significantly greater risk of self-biting and self-damage than did feral born animals raised with peers. Studies of isolation-reared macaques showed normal behavior for the first 3 years of life but then showed a sharp increase in self-threatening behavior, especially under stimulating conditions. Rhesus monkeys raised in isolation showed an increased risk of head banging, rocking behavior, frustration, and self-aggression [5]. The author has noted a significant increase in feather-picking behavior in captive hatched Moluccan cockatoos and the CAG over that seen in imported Moluccan cockatoos and CAG that were raised with peers.

Unstable social order is thought to lead to stereotypies in other animals and may play a role in psittacine birds as well. The species that are the most prone to feather picking and self-mutilation are flocking species that come from large flocks. These birds have evolved to conform to a strict social order. Social order is often ambiguous for the pet bird. In many social interactions it is allowed to feel socially dominant only to be dominated in other situations. Some of the situations that would infer social dominance to a psittacine bird include dominant



Figure 3. Self-mutilation is common in Moluccan Cockatoos. This Moluccan Cockatoo originally presented with lesion on its chest greater than 4 cm in diameter. The bird had removed over half of its keel bone. This picture was taken approximately 18 months after the onset of treatment. The bird has worn the VSP (Veterinary Specialty Products, Boca Raton, FL) acrylic collar throughout the treatment.

(high) perching, above the height of its peers (in this case the bird's owners), allowing the bird to ignore commands or protect its territory through aggressive behavior (eg, striking with the beak or biting).

Competition from other birds or from persons or animals (especially other pets) in the environment may be a predisposing problem. This may be true especially for birds that lack desensitization to normal environmental stimuli in early life. Additional studies on the effect of various factors involved in psittacine neonatal development and subsequent adult behavior are needed.

Lack of predictability and controllability of the environment may cause conflict. In a captive environment the parrot is unable to perform appropriate species-specific behavior to eliminate or avoid stress. A changing or tumultuous environment is commonly reported in the history of psittacines that begin feather picking, especially when these birds were not acclimated (desensitized) to a variety of situations at an early age.

Incidence

The incidence of these behaviors in psittacines or other animals is not well studied. In man, self-mutilation occurs at a rate between 14 and 750 per 100,000 (0.014% to 0.75%) in the general population. This number is much higher in populations with multiple personality disorders (34%), persons with antisocial personality disorders (24%), patients with anorexia (35%), and patients with bulimia (40.5%) [6]. The incidence of self-mutilation among a prison population (24%) has been reported as one of the highest subpopulations investigated, and the self-mutilation behavior represents a significant problem in the prison system [5]. A correlation between the prison population and the population of psittacines that feather pick and self-mutilate has yet to be determined.

Pathogenesis

Conflict may result in stereotypic behavior. Should the conflict persist, the stereotypic behavior is reduced to a few elements or abbreviated. In the case of a feather-picking psittacine, grooming behavior may become focused on a specific location such as the feathers at the base of the neck or on the legs. The behavior then becomes repetitive and increased in frequency. It is at this stage that most bird owners notice that their birds are picking their feathers or self-mutilating. If the conflict and behavior continue, it may be performed out of context, without the original conflict or an identifiable stimulus.

It is assumed that there are a number of biochemical alterations and neuropathologic changes that occur in the animal that exhibits these behaviors. Information on this subject and its application to treatment of avian patients with stereotypic behavior is still scant. Self-injurious behavior has been seen in certain human conditions of hereditary sensory neuropathies and in animals with loss of sensation or persistent neuropathic pain resulting from peripheral or dorsal nerve root section. An animal model of self-aggression has been established in rats. In this model, stereotypic behavior is induced in the rat by administration of amphetamine. Induced stereotypic behaviors range from inappropriate sniffing progressing to licking and then self-biting. The intensity of biting ranges from occasional biting to holding a foot or limb in the mouth to total amputation of digits or entire limbs.

Studies of this and other animal models have proven that endogenous brain opioid peptides are released under stress and activate dopaminergic neurons. Stereotypic behavior appears to be related to this increased dopaminergic activity and to an increased dopamine turnover. Amphetamine-induced stereotypies are influenced by the removal of non-dopaminergic, probably noradrenergic, mechanisms by the destruction of noradrenergic neurons in the brain (with pharmacologic agents such as reserpine, phenoxybenzamine, clonidine, and diethyldithiocarbamate).

Self-mutilation may also be induced in rats through creation of neuromas. In this model, pain is believed to play a significant role. Blocking endogenous opioids by administering naloxone results in an increase in both percentage of animals that self-mutilate and the severity of the self-inflicted lesions [7]. This is caused by changes in the way the central nervous system handles sensory input that evolves over time to aggravate pain. Sympathetic activity has been identified as one of the factors in this process by increasing the afferent barrage through ectopic discharges from neuromas [8].

Diagnosis of feather picking and self-mutilation in psittacines

Because there are both dermatopathies and systemic diseases that may result in increased grooming, feather, or skin destruction, the diagnosis of the feather-picking bird should always start with a thorough history, physical examination, complete cell count, serum chemistry profile, and polymerase chain reaction (PCR) testing for psittacine beak and feather disease, and serology and PCR testing for polyomavirus. If skin inflammation or an exudate is found on physical examination, exfoliative cytology, impression smears, culture, sensitivities, and biopsy may be indicated. Whole body radiographs and toxicology tests may be indicated in some cases. Skin disorders and systemic disease may be detected. These diseases may play a primary or secondary role in feather-picking. Also, they may have a direct effect on skin or on the bird's behavior (causing an acquired behavior), or they may create a conflict in the bird's life (causing an experiential behavior).

The client should be instructed to take a feather-picking survey by documenting evidence of feather picking at several time-points throughout the day. At a minimum the floor of the bird's cage should be examined first thing in the morning, before leaving the home, upon arriving home later in the day, and before going to bed. This survey may aid in the identification of conflicts, the correction of which may lessen or even correct the feather picking. Other time points may include when one spouse is home, only when the dog is in the house, when the bird is alone, only when caged (this is very common), and many other situations too numerous to list here. The hour or so between when the bird awakes and the time its owners leave for work seems

to be very stressful, probably because the bird is anticipating being fed or anticipate being abandoned. This is also often a busy time in the home. Any of these stimuli can create conflict for the bird.

A feather-picking female Moluccan cockatoo was presented to the author several years ago. This bird had picked or pulled most of its body covert feathers, leaving only those on the head and upper neck undamaged. This bird lived in a busy home with three young children, their parents, a housekeeper, and a nanny. The bird lived in a large, well-lit family room where the children and the nanny spent the day. The bird was not caged and was allowed to move freely in this room. In the evening the bird moved with the family to the dining room to eat and then back to the family room. At night the bird was caged and the family retired to bedrooms upstairs to sleep. When the owners performed their feather-picking survey, they discovered that the bird picked only when caged and alone at night. The bird was moved to a child's bedroom to sleep at night, and the picking problem resolved.

The author's practice includes several clients in the US Navy whose birds form a strong bond to one spouse during the time that the other spouse is out to sea (typically a 6-month period). The bird then begins feather picking upon the voyager's return. These cases are challenging; however, the problem may resolve as the bird rekindles its relationship with the previously expatriated spouse. These behaviors rarely correspond with breeding season; therefore, the forming of pair bonds in psittacine birds appears to be a long-term relationship, not a seasonal breeding behavior. Cases such as this may also be based on social order and the consistency of social order.

Treatment of feather picking and self-mutilation in psittacines

The traditional treatments suggested or employed to correct feather picking do not work and may cause harm. The mechanical prevention of feather picking or self-mutilation (e.g., Elizabethan or cervical collars or other physical restraining devices) as the only treatment not only is ineffective but inappropriate and should be considered inhumane. Such treatment fails to address the cause of the behavior and at best adds to the patient's conflict. Mechanical barriers to plucking are generally only appropriate if required to prevent severe injury or death.

Equally ineffective is topical treatment of the bird's feathers or mutilation wounds. Bitter apple or other noxious agents sprayed on the feathers add conflict also. All birds are fastidious about their feathers and fouling them with any substance only causes the bird to focus on preening the affected feathers. Two cases illustrate this point, both of which occurred in young CAGs. One bird began feather picking after the owner began bathing the bird several times a week on the advice of patrons of an internet mail group. This bird had removed the majority of the contour feathers on its neck, chest, and back only 3 weeks after the owner initiated the bathing every 2 to 3 days. The bird gave up the behavior just as soon as the owner stopped the bathing. The second case involved a young CAG that the owner began spraying with a dilute solution of an antiseptic mouthwash (Listerine, Warner-Lambert Consumer Health care, Morris Plains, NJ). This was sprayed on the bird's feathers at the advice of a speaker at a bird club. This treatment was claimed not only to kill skin parasites but also to prevent feather picking. Again, the bird stopped feather picking once the treatment was stopped.

There is no benefit in any form of punishment in these cases. Yelling at the bird, spraying it with water from a spray bottle or squirt gun can only worsen these behaviors. Punishments are frequently a contributing cause of feather picking, self-mutilation, and other stereotypies. Punishment may act as a source of conflict (fear, loss of control, unstable social order) or may sustain or exaggerate conflict by conditioning. The feather picking may be inadvertently rewarding to the bird by gaining the owner's attention.

Treatment early in the development of feather picking yields the best results. Long-standing picking behavior is difficult or impossible to correct. Attempts should be made to identify and remove the cause(s) of the conflict. This may be difficult as stereotypic behavior may persist after the conflict is gone. There are critical factors in eliminating the behavior. First, find an alternative to caging such as an outdoor flight cage during day or an large indoor bird area. Second, develop a job or a compelling occupation or activity for the bird that uses normal

behaviors. Third, create a stable social environment because parrots need social order. Finally, use obedience training to establish acceptable parameters and consistency in both the bird and its owner's behavior. Reinforce good behavior and avoid reinforcement of negative behaviors. A reliable cause (the bird's response to a command) and effect (the owner's praise and attention) add stability to the bird's social environment.

Housing/physical environment

The typical pet parrot is housed indoors in a cage not much larger than itself. Often it is allowed some time out of the cage, most often to sit on top or on an open perch with similar restricted space. This environment is very different from the environment of the wild parrot, which would range over many miles throughout a day. The parrot's environment should be changed to provide several stimulating experiences. The bird should spend the majority of time in an environment that does not produce a high level of arousal or provide physical restraints that prevent the bird from exercising needed typical behaviors.

Preferably the bird should be housed outdoors during the morning and early afternoon hours in a large flight cage (large enough to give the bird the perception of being in an open space rather than a locked box). A 4' × 6" × 6" flight cage (or larger) made of 2" × 3" × 12 gauge welded wire is recommended in the afternoons and evenings, which are social times, and the pet parrot should be brought indoors to spend time with its owners. The bird may be allowed on an open perch during this time. The parrot may sleep on an open perch or in a cage. If caged for sleep, this should be the only time the bird is in a restricted enclosure. In cold environments or in other situations where it is impossible for the bird to be housed outdoors, the bird should be housed in a room or large area. The idea of having a non-caged parrot is a new one and may not be well accepted by the pet owner nor will it be popular with pet shop owners. This area should be made so that it is safe for the parrot and acceptable to the owner. To properly "bird-proof" a large area, the client may need extensive instructions.

Environmental enhancement

Compelling occupation

"Iron rusts from disuse, stagnant water loses its purity and in cold weather becomes frozen; even so does inaction sap the vigors of the mind." Leonardo da Vinci

A major conflict for the psittacine patient is a lack of meaningful activity. Parrots in the wild are constantly busy, spending many hours a day procuring and eating food and caring for their social relationships. It is important to find the pet psittacine a "Compelling occupation" (CO) using normal behaviors of the parrot such as chewing, grooming, eating, and nesting. A CO is an activity that when presented to the bird it is compelled to involve itself. The most often CO for a psittacine bird involves destroying something. A popular CO for large psittacines is a perch made of soft wood, most often 2" × 4" pine lumber. Most parrots are compelled to chew the corners off the perch and will do so repeatedly (Fig. 4). Other highly successful COs include: tearing up paperback books, cardboard boxes, paper bags, etc.; tearing leaves and bark off branches; tearing palm fronds; disassembling natural fiber brooms; unraveling cotton rope; eating time-consuming foods such as corn on the cob, pomegranates (best done outdoors), grapes, whole loaves of whole grain bread; undoing nuts and bolts (good for cockatoos); and working seed from food puzzles.

Lumber perches (2" × 4") used while breeding have been an irresistible object to most psittacines. Interestingly, the patterns that the lumber is chewed seem to vary with the species of psittacine. Some species chew on the top side; others hang over the wood to chew on the bottom. Some focus on an end, while others work on the center portion.

The use of paperback books came from a client with a CAG that feather picked to the point of having not a single feather below its neck. This client was an avid reader and when directed to find a CO for her bird thought immediately of how her pet loved to destroy her books at any



Figure 4. The author's favorite compelling occupation for large psittacines is a perch that is square or rectangular in shape, made of soft wood, such as a pine 2" × 4". Most parrots are compelled to chew the corners off the perch and will do so repeatedly. This is the author's 7-year-old Meyer's Parrot working on a perch that has been in his cage for less than 60 days.

opportunity. It has been many years since this client gave this bird its first book to tear up and during that time the bird has destroyed a paperback book every day. It has never again picked its feathers. This owner also initiated other changes and improvements in her bird's environment besides supplying books to shred.

Obedience training

The vast majority of pet psittacines are not trained or are trained only to do the most simple of behaviors such as to step up on the owner's hand. The author has observed that not only is there a benefit of obedience training for the feather-picking bird, but that birds that have had obedience training are less likely to develop stereotypic behaviors. As a result, obedience training is recommended for all parrots (Psittacidae). Every pet parrot should be taught to do a minimum of four basic behaviors: step-up, come in response to its name, stay, and "poop" on command. These "manners" make the bird a better pet, but more importantly, train the owner to display consistent behavior toward the bird and establish a social order. Training is simple. The bird is given a consistent command and is rewarded both verbally and materially (typically with sunflower seeds) for a positive response. Many owners build on these skills and teach their parrot to do many behaviors. The owners who spend the time to teach these behaviors often learn the potential that their parrots have to be wonderful companion animals while helping to prevent the development of unwanted behaviors in the future.

Drug treatment and avoidance as adjuncts to behavior modification

Behavioral pharmacology is a valuable adjunct to the treatment of psittacines with stereotypic behavior. It should not be the first or only treatment for a behavioral problem.

Many drugs are available for the treatment of behavioral disorders. Many of these have been used to treat stereotypic behavior in other species of animals and man. Only a very few have been examined as possible adjuncts to treatment of feather picking or self-mutilation in psittacines. As mentioned above, dopamine turnover is increased in animals with stereotypies and stereotypies can be induced by drugs that activate the dopamine system, such as amphetamine. Endogenous brain opioid peptides are released under stress and activate the dopaminergic neurons. Stereotypies are responsive to opiate-receptor blocking drugs and dopamine antagonists.

Dopamine antagonists and opiate-receptor blockers

Haloperidol (Haldol) is an antipsychotic drug of the butyrophenone group. Butyrophenones inhibit the effects of dopamine by occupying dopamine receptor sites in the body. Haloperidol is used for the treatment of schizophrenia and other psychoses and mania, especially to calm severely agitated or violent patients and to relieve severe anxiety. Haloperidol also is used to treat intractable hiccups, tics, and severe nausea. Of any single psychoactive drug, haloperidol has been proven effective with some patients of several species including CAGs, cockatoos, conures, and macaws. It is available as tablets, capsules, an oral solution, an injection, and a depot injection. The liquid product is colorless, tasteless, and water soluble, which allows it to be diluted. Doses that have proven effective range from 0.10 to 0.4 mg/kg PO daily. The dose may be increased in 0.01 mg/kg increments if there is no response in 5 to 7 days and no negative side effects are experienced. The most commonly encountered side effect is sedation. Anecdotal reports of severe illness and fatalities have been reported in the Hyacinth macaw.

Narcotic agonists/antagonists such as naloxone and the longer acting opiate-receptor blocker naltrexone (Trexan) are promising from a pharmacologic standpoint. These drugs may be useful in diagnosing whether a stereotypic behavior is associated with endogenous, self-stimulation of opioid receptors. Naloxone may be used to test if a behavior will respond to narcotic antagonists. A dose of 11 to 22 µg/kg is given intravenously and a reduction of the behavior should be observed within 20 minutes. Successful treatment with these drugs has been reported in dogs and cats with stereotypies [9–11]. There are only antidotal reports of successful treatment in psittacines. Hydrocodone is structurally similar antitussive agent, which has been used successfully to treat canine acral lick granuloma and self-mutilation in cats [12]. The author has had limited success using Hydrocodone in self-mutilating cockatoos.

Tricyclic antidepressants

The antidepressants most commonly used in stereotypies are known as tricyclic antidepressants (TCAs). In human medicine, they are commonly used to treat endogenous depression, panic attacks, phobic and obsessive states, neuropathic pain states, and enuresis in children. The TCAs have three major effects that vary in degree depending on the drug: (1) sedation, (2) peripheral and central anticholinergic action, and (3) potentiating of central nervous system biogenic amines by blocking their reuptake presynaptically. The tertiary amines, doxepin (Sinequan), starting at a dose of 1 to 2 mg/lb q 12 h, and clomipramine (Anafranil) have been used with some success. Published research on the use of clomipramine, a dose of 1.0 mg/kg orally, either once daily or divided BID, for 6 weeks was evaluated. In the study, 3 of 11 birds responded dramatically initially to clomipramine by decreasing feather-picking or self-mutilating behavior [13]. Some birds, however, may require a dose as high as 2 mg/kg q 24 hours.

The serotonin-specific reuptake inhibitors (SSRIs) are derivatives of TCAs. These agents include fluoxetine (Prozac), paroxetine (Paxil), sertraline (Zoloft), and fluvoxamine (Luvox, Solvay). These drugs have been successful in treating OCD in man but, contrary to reports in the media, have only had little success in treating stereotypies in animals. The author treated several feather-picking and self-mutilating birds with Prozac, but yielded little or no response. The other SSRIs are not well studied in animals but hold some promise for treatment of anxiety-related behavioral problems.

Benzodiazepines

The benzodiazepines include diazepam (Valium), chlordiazepoxide (Librium), clorazepate (Tranxene), lorazepam (Ativan), alprazolam (Xanax), and clonazepam (Clonopin). Benzodiazepines have anxiolytic effects and also act as a CNS depressant. At low doses they act as sedatives, tempering excitement. At moderate doses they act as antianxiety agents, and may facilitate social interactions. At high doses they act as hypnotics, facilitating sleep. Ataxia and profound sedation occur at doses beyond those needed for anxiolytic effects. In man, dogs, and cats benzodiazepines have been used to treat anxiety that is both generalized and associated with specific life events. Drugs in this group primarily have been used in cases of acute, aggressive severe feather picking or self-mutilation where anxiety appears to play a significant role. This is most often the case with CAGs, conures, and macaws. The author has the most experience using diazepam. Much of the effect of diazepam (at least in mammals) and most other benzodiazepines comes from the intermediate metabolite, desmethyldiazepam. This appears to be the case in psittacines in which the effects may last longer than expected. The author suggests a starting dose of 5 mg/kg intramuscularly or by mouth q 8 to 12 h. This dose must be adjusted to suit the patient and monitored. In mammals, metabolism of desmethyldiazepam is slowed by obesity, repeated dosing, and renal and hepatic impairment. This may also be true with psittacines. The triazolodiazepines (alprazolam and triazolam) may be better suited for the avian patient with its rapid metabolism.

Nonspecific anxiolytics

Buspirone (BuSpar, Bristol-Myers Squibb, Princeton, NJ) is an anti-anxiety agent that is not related chemically or pharmacologically to benzodiazepines, barbiturates, or other sedative or narcotic drugs. Its mechanism of action is unknown; however, it has been shown to have an affinity for serotonin receptors and brain D2-dopamine receptors. Dogs and cats with stereotypic behavior have been successfully treated with buspirone [14,15].

Hormone therapy

The use of a number of hormones has been suggested for the treatment of feather picking, most often aimed at reducing sexual urges. Limited success has been experienced using this approach in birds that are breeding or actively laying eggs, but not in any other case. It is likely that the breeding behavior is the cause of conflict in these cases. Human chorionic gonadotropin (hCG) may be given at 1500 IU/kg repeated every 14 days or as needed to stop ovulation. Similar results have been seen using Depo-lupron at 100 micrograms/kg q 14 days for 3 treatments. Lupron is thought to decrease the release of FSH and LH from the anterior pituitary.

Avoidance: Elizabethan collars and bandages

The physical restriction of stereotypes as the only treatment is inappropriate and may be considered inhumane. That is not to say that collars and bandages do not have their place. This is especially true in the patient whose life is threatened if the self-mutilation is not stopped. The use of bandages, where appropriate, is recommended over the use of collars and the use of cervical collars over the use of Elizabethan collars. The formed plastic collars made by Veterinary Specialty Products (VSP) (Veterinary Specialty Products, Boca Raton, FL) work very well and have proven to be both safe and efficacious. They may be used with or without the Elizabethan collar extension. For species or individuals that may react violently to the initial application of a collar (eg, CAG) the administration of a parenteral benzodiazepine or butorphanol at recommended dosages before collar application may increase the bird's acceptance of the device.

Desensitization and counter-conditioning

Gradual desensitization and counter-conditioning may be necessary to effect treatment of stereotypes. These techniques are well proven methods in animal behavior and show promise in

the treatment of the stereotypies of psittacines. In desensitization, exposure to arousing stimuli is controlled to avoid evoking the stereotypic behavior. The stimuli must be identifiable and reproducible if desensitization is to be implemented successfully. Ideally, the training should be designed so that no stereotypic behavior occurs. An example is the bird that feather picks when in the presence of one spouse. In this case, the bird would be exposed to the disliked spouse while being praised by the favored spouse. If the bird shows agitation or turns its attention to grooming, the bird is removed from the situation.

In some cases the stimulus may be paired with a pleasant experience. This works best with auditory stressors (eg, doorbells, hair dryers, vacuum cleaners). As the bird responds, it will begin to associate the food item with the sound. At this point the bird may be asked to perform a trick behavior, such as waving, before the food treat is offered. Eventually the bird will perform the trick behavior when the target stimulus is present. This is known as counter-conditioning.

Summary

Feather-picking and self-mutilation behaviors are common in psittacine birds. These behaviors are best defined as stereotypic behaviors or obsessive compulsive disorders. There is likely a genetic predisposition for these behaviors as reflected in the overrepresentation of a number of species of psittacines. Stereotypies most often result from a high level of arousal and the inability to respond with the appropriate natural behaviors. More specifically, conflict may be induced by the absence of releasing stimuli or target objects. On a chemical level, stereotypic behavior appears to be related to an increased dopaminergic activity and an increased dopamine turnover.

Feather-picking and self-mutilation patients are challenging to treat and are most likely to respond to treatment at an early stage of development. The best results are obtained by identifying and removing the cause of conflict, enhancing the environment, using appropriate drugs when indicated, and employing counter-conditioning.

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