# Diagnosing and treating the feather-plucking parrot

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**Figure 1.** A common presentation of birds with feather destructive behaviour is a normally feathered head with a complete lack of feathers on the rest of the body as seen in this African grey parrot.

**Feather plucking, feather picking or feather destructive behaviour (FDB) is one of the most common, and frustrating, reasons for which caged psittacine birds are presented to the veterinary hospital, with an estimated prevalence of 10% (van Zeeland et al, 2009; Gaskins and Bergman, 2011; Rubinstein and Lightfoot, 2014).**

This condition has been reported in many psittacine species, but seems over-represented in some as 39.4% of grey parrots (*Psittacus erithacus*) and 43.4% of cockatoos (*Cacatua* species) were affected in one UK study (Jayson et al, 2014).

Amazon parrots (*Amazona* species), cockatiels (*Nymphicus hollandicus*) and budgerigars (*Melopsittcus ondulatus*) are uncommonly presented with this complaint (van Zeeland et al, 2009).

Feather plucking is typically complex, with several factors (medical, physical and/or behavioural, environmental, genetic and neurobiological) being investigated as often contributing to the development to varying degrees of abnormal or stereotypic behaviours (van Zeeland et al, 2009 and 2013a).

Parrots may be seen over-preening or biting, plucking or chewing feathers until feather damage, or complete removal, occurs (**Figure 1**). These behaviours may sometimes be associated with self-inflicted soft tissue injuries and feather damage, which prevents their normal regrowth (Harrison 1986; van Zeeland et al, 2009; Kubiak, 2015).

Contour and down feathers (which are often plucked or pulled) are usually the primary targets, but tail and flight feathers (which are often chewed) may also be affected (Nett and Tully, 2003a). Feather damage usually occurs in the readily accessible regions of the neck, chest (**Figure 2**), flank, inner thigh and wing web (Harrison, 1986; Nett and Tully, 2003a), while the feathers on the parrot's head remain intact.

## Diagnostic and therapeutic approach

**Figure 2.** Feather damage usually occurs in the readily accessible regions of the chest, as seen in this green winged macaw (*Ara chloroptera*), neck, flank, inner thigh and wing web. Image: Wendy Bament.

In the challenging quest to resolve the frustrating issues associated with FDB in companion birds, meticulous evaluation of all possible triggers is necessary to identify underlying causes.

A full and detailed history (including species, sex and age, rearing details, source, husbandry and housing, diet and behaviour, interaction with owner and conspecifics, and wing clipping) should be taken before any clinical examination. Extensive tailored history forms are available online, which can be particularly useful when dealing with these cases.

The clinician is challenged with several dilemmas. Normal preening behaviour, intrinsic feather loss (not self-inflicted, nor the result of normal preening of abnormal feathers), and feather destructive behaviour (self-inflicted feather loss, damage or destruction regardless of aetiology) need to be distinguished (Rubinstein and Lightfoot, 2014).

Preening is an essential social behaviour that can be performed individually (to maintain skin and feathers) or between birds in a flock to reinforce reciprocal bonds (van Zeeland et al, 2009; Kubiak, 2015). However, self-comforting preening can run out of control and has been reported as a coping strategy at times of stress (Garner et al, 2003), as supported by significantly higher faecal

corticosterone levels (Owen and Lane, 2006).

Furthermore, where birds are housed together, it is also essential to differentiate between self-plucking and plucking done by others (Chitty, 2005; Lightfoot and Nacewicz, 2006; **Figure 3**).

**Figure 3.** Loss of feathers on the head only is often an indication of excessive preening from a cage mate as in this cockatiel. Image: Wendy Bament.

Garner et al (2006) describe markedly different genetic and environmental effects on stereotypies (repetitive behaviours performed out of their original context with no obvious purpose) as compared to psychogenic feather picking – emphasising how both classes of abnormal repetitive behaviours are common in captive parrots. Unfortunately, the clinician's tasks are complicated by the scarcity of controlled studies related to the underlying causes of these behaviours and paucity of information on the factors that may predispose a parrot to their development.

Severely ill birds should be stabilised first and a hands-on examination delayed. When possible, a complete physical examination should be carried out and inspection of the skin and feathers performed. The pattern of feather loss and distribution (loss of feathers on the head alone, on the body alone, or on the head and body), and the appearance of the feathers and skin should be carefully evaluated as these can give useful information (van Zeeland, 2009 and 2013a; Kubiak, 2015).

Further evaluation will help the clinician understand whether FDB has a primary medical aetiology,

involves husbandry and/or nutritional issues, is psychogenic in origin or, as is often the case, includes a combination of factors (Rubinstein and Lightfoot, 2014).

**Figure 4.** A minimum database should include haematobiochemistry. Here, a blood sample is being collected from the right jugular vein of an African grey parrot.

A minimum database should be collected including haematobiochemistry, faecal parasitology and cytology – also, view whole body radiographs and test for *Chlamydophila psittaci* to rule out medical problems (**Figures 4** and **5**). This is even more important when we consider birds are prey animals and can easily mask signs of disease.

Further and more specific tests may be required based on clinical and other findings. The list of possible underlying causes of feather loss and FDB are given in **Table 1**.

Many systemic diseases can damage the feathers to the extent they are easily lost; these birds may be incorrectly labelled as feather pickers (Rubinstein and Lightfoot, 2014).

Birds are selective feeders and won't self-select for dietary completeness (Koutsos et al, 2001). Chronic nutritional disorders – which can be considered both medically and environmentally related – can also result in a variety of feather dystrophies. Less often, viral infections (circovirus, *Polyomavirus*) and parasitic infestations damage the feather follicle and shaft, weakening their attachment and allowing the feather to be easily shed (Rubinstein and Lightfoot, 2014).

Numerous and diverse medical conditions have been associated with FDB (**Table 1**) and a comprehensive medical work-up should be indicated to be able to reach a definitive diagnosis. Where this is not achievable, the clinician should choose those tests more likely to be informative – considering the history, symptoms and clinical signs of the patient.

Any condition causing pain and discomfort can potentially predispose to feather plucking,

especially directly over the site of irritation. For some of these conditions, the link with FDB remains speculative and further research would be necessary to elucidate these theories (Rubinstein and Lightfoot, 2014). If a medical problem is identified, a specific therapy can be targeted. However, it is always important to point out to owners that even when a physical problem is addressed and resolved, the animal may continue to pull feathers out of habit.

**Figure 5.** Two-view whole body radiographs (latero-lateral and ventrodorsal) should be taken to help rule out medical problems.

If an environmental or medical basis for feather loss or FDB cannot be found, behavioural and/or psychological factors must be considered. It is important to recognise FDB is only observed in captive psittacines and, therefore, is considered a reflection of the environment where these animals are kept. Many of these behaviours are comparable to stereotypies, which occur mainly at times of stress, conflict and frustration and may, therefore, be considered aberrations of normal/typical behaviours for that species (Dantzer, 1986; Wilson and Lightfoot, 2006; van Zeeland et al, 2009; Rubinstein and Lightfoot, 2014).

Potentially, certain behavioural disorders, including FDB, may be prevented, and when established, can possibly be reversed with radical environmental and housing modification, foraging enrichment and provision of adequate challenges, tasks and appropriate training (Jenkins, 2001; Meehan et al, 2003; Lumeij and Hommers, 2008; van Zeeland et al, 2013b).

With this in mind, it becomes clearer how discussions with owners about basic nutritional and husbandry requirements and psychological well-being of their parrots become vital. However, psychogenic FDB is a multifactorial and complicated entity that is unlikely to respond to a single intervention or pharmacological treatment (**Table 1**). Even with a combination of approaches, success in resolving FDB may not be achieved (Rubinstein and Lightfoot, 2014).

## Conclusion

Feather loss is a complicated, multifactorial, frustrating and confusing clinical presentation. Underlying aetiologies and associated risk factors may include a combination of medical, environmental, nutritional and psychological components. A comprehensive history and medical work-up are therefore essential when approaching a bird with feather loss or is feather picking.

In this short review, the clinical, diagnostic and possible therapeutic approaches available, when presented with such a challenge, were considered. Although the relative scarcity of controlled studies related to the underlying causes of feather loss in companion avian species complicates the understanding of this extremely common disorder, and to avoid oversimplification of such a confusing condition, the reader is strongly encouraged to refer to previously published literature for more in-depth and comprehensive information.

**Table 1. Medical and non-medical causes and/or risk factors associated with feather loss and feather plucking with suggested diagnostic and therapeutic approaches (Chitty, 2005; Rubinstein, 2014; van Zeeland, 2009; Kubiak, 2015)**

| Medical causes/risk factors | Suggested further diagnostics | Possible treatment options |
|---|---|---|
| Ectoparasites | Tape preparations, skin scrape, cytology, bacteriology, histopathology | Fipronil, carbaryl or avermectin drugs |
| Endoparasites | Parasitology, cytology, bacteriology, PCR | Metronidazole, fenbendazole, or ronidazole or other antiparasitic treatment depending on diagnosis |
| Allergy (contact, inhalation, food) | Intradermal skin testing (Colombini, 2000; Nett 2003b), histopathology (Garner, 2008). May be unreliable. | Omega oils, antihistamines, diet change, husbandry changes |
| Skin irritation/desiccation (low humidity, irritants, toxic substances) | Tape preparations, skin scrape, cytology, bacteriology, histopathology | Depending on diagnosis, environmental modifications |
| Psittacine beak and feather disease (circovirus) | PCR on whole blood, feather pulp or cloacal swab (Hess, 2004) | N/A |
| *Polyomavirus* | PCR analysis of whole blood and a combined choanal/cloacal swab | N/A |
| Proventricular dilatation disease (*Bornavirus*) | Radiography, fluoroscopy, histopathology, PCR (choanal/ choacal swab, brain, retina or proventriculus), serology | Anti-inflammatory drugs, euthanasia |
| Hypothyroidism | Thyrotropin stimulation test (Lothrop, 1985; Zenoble, 1985), radioimmune assay (Greenacre, 2001). May be unreliable | Treatment with thyroid supplementation is unreliable while waiting for diagnosis |
| Reproductive disorder | Haematobiochemistry, radiography, coelioscopy | Depending on diagnosis |
| Pain | Haematobiochemistry, radiography, coelioscopy, *Chamydophila* testing (antigen, antibody, PCR) | Depending on diagnosis |
| Liver disease | Haematobiochemistry, radiography, coelioscopy, *Chamydophila* testing (antigen, antibody, PCR) | Depending on diagnosis |
| Kidney disease | Haematobiochemistry, radiography, coelioscopy | Depending on diagnosis |
| Septicaemia | Haematobiochemistry, radiography, coelioscopy, *Chamydophila* testing (antigen, antibody, PCR) | Depending on diagnosis |
| Hypocalcaemia | Haematobiochemistry, ionised calcium, magnesium | Calcium supplementation, supportive care |
| Chlamydophilosis | Haematobiochemistry, radiography, coelioscopy, *Chamydophila* testing (antigen, antibody, PCR) | Doxycycline, supportive care |
| Air sacculitis | Haematobiochemistry, radiography, celioscopy, *Chamydophila* testing (antigen, antibody, PCR) | Depending on diagnosis |
| Heavy metal toxicosis | Lead, zinc blood/tissue levels | Chelation therapy, supportive care |
| Dermatitis/folliculitis (bacterial, fungal, yeast) | Tape preparations, skin scrape, cytology, bacteriology, histopathology | Long-term administration of antibiotics and/or antifungals as required by diagnosis |
| Congenital/genetic feather deformity (for example, feather dusters, straw feather, feather cysts) | Full work-up | N/A |
| Mutilation syndromes | Full work-up, histopathology | Mechanical barrier (collar, vest), long-term antimicrobial therapy (to treat and/or prevent secondary infections), pain control, psychotropic medications, euthanasia |
| Neoplasia | Haematobiochemistry, radiography, celioscopy, histopathology | Chemotherapy has been documented for certain tumours, supportive therapy, antivirals |
| Nutritional deficiencies (for example, vitamin A)/ dietary imbalances | Dietary history (diet offered and items actually consumed), full medical work-up | Depending on diagnosis, supportive care, vitamin supplementation |
| **Non-medical causes/ risk factors** | **Suggested further diagnostics** | **Possible treatment options** |
| Environment (for example, inappropriate cage, exposure to toxins, altered photoperiod, low humidity) | Detailed history | Husbandry changes, environmental enrichment |
| Malnutrition | Dietary history (diet offered and items actually consumed) | Dietary changes, vitamin supplementation |
| Psychogenic (for example, attention seeking, boredom, separation anxiety, insufficient social interaction and mental stimulation, lack of exercise, inappropriate bond to owner and reinforcement, stressors, sexual frustration, hormonal changes) | Detailed history, rule out medical causes | Environmental enrichment, foraging and playing opportunities, challenges and tasks, exercise provision, training. Pharmacologic therapy investigated: opioid receptor antagonists (for example, naltrexone), antipsychotic drugs (for example, haloperidol), serotonergic agents (for example, clomipramine, fluoxetine, paroxetine), hormonal therapy (leuprolide acetate, GnRH implants; Seibert 2007; van Zeeland 2009; Rubinstein, 2014; Forbes 2009; Mans, 2014). No clinical trials available. Not licensed. |

**Table 1.** Medical and non-medical causes and/or risk factors associated with feather loss and feather plucking with suggested diagnostic and therapeutic approaches (Chitty, 2005; Rubinstein, 2014; van Zeeland, 2009; Kubiak, 2015)

- Please note some drugs listed in **Table 1** are not licensed in psitticines and are used under the cascade.

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