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Popular Article

Clinical Management of Avian Fractures: From Diagnosis to Rehabilitation

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Introduction:

Fractures are among the most common orthopaedic conditions encountered in avian medicine. They occur due to trauma, nutritional deficiencies, metabolic bone disorders, predation, accidents, or improper handling. Managing fractures in birds presents unique challenges because of their lightweight skeletal system, thin cortical bone, extensive pneumatic bones, rapid metabolism, and the need to preserve flight function in many species. Successful fracture management requires a thorough understanding of avian anatomy, fracture biology, stabilization techniques, and postoperative rehabilitation.

Unique Features of the Avian Skeletal System:

The avian skeleton possesses several characteristics that distinguish it from mammals:

- Bones are lightweight with thin cortices and relatively large medullary cavities.
- Many bones are pneumatic and connected to the respiratory system.
- Birds have a higher metabolic rate and generally exhibit rapid bone healing.
- The wing functions as a highly specialized structure for flight, requiring precise anatomical alignment.
- Limited soft tissue surrounding long bones increases the risk of open fractures and delayed healing.

These anatomical adaptations influence fracture diagnosis, treatment planning, and prognosis.

Etiology of Avian Fractures:

Common causes of fractures include:

- Trauma from collisions with windows, vehicles, or buildings.
- Predator attacks by cats, dogs, or wild animals.
- Falls from perches or nesting sites.

- Wing entrapment in cages or enclosures.
- Nutritional deficiencies, particularly calcium, phosphorus, and vitamin D.
- Metabolic bone diseases.
- Gunshot injuries in wild birds.
- Improper restraint or handling.
- Pathological fractures caused by neoplasia or infections.

Clinical Signs:

Birds with fractures may exhibit:

- Inability to fly
- Drooping wing
- Limb lameness
- Swelling and pain
- Abnormal limb position
- Crepitus
- Bleeding in open fractures
- Reduced appetite
- Depression or lethargy
- Reluctance to perch or move

Severely injured birds may also present with shock, dehydration, or respiratory distress.

Diagnosis:

Clinical Examination:

- ❖ A complete physical examination should be performed while minimizing stress. Initial stabilization should precede orthopaedic evaluation in critically injured birds.
- ❖ Important examination findings include:
 - Limb alignment
 - Soft tissue injury
 - Neurological function
 - Vascular integrity
 - Presence of open wounds
- ❖ Radiography remains the gold standard for fracture diagnosis.

Principles of Fracture Management:

The objectives of fracture treatment are to:

- Restore anatomical alignment.
- Achieve stable fixation.
- Preserve blood supply.
- Minimize soft tissue trauma.
- Restore limb function.
- Enable early return to normal activity or flight.

Emergency stabilization includes treatment of shock, hemorrhage control, oxygen supplementation, fluid therapy, and analgesia before definitive fracture repair.

Conservative Management:

Conservative treatment is suitable for selected fractures, particularly stable or minimally displaced fractures.

1. Cage Rest: Restricted activity allows uncomplicated fractures to heal naturally.

2. Bandaging Techniques: Common external coaptation methods include Robert Jones bandage (modified), Splints and External support bandages

Surgical Management:

❖ **Intramedullary Pinning:** Intramedullary (IM) pins provide internal stabilization.

❖ **External Skeletal Fixation (ESF):** External skeletal fixators consist of pins connected externally using bars or acrylic materials.

❖ **Bone Plates and Screws:** Miniature bone plates provide rigid fixation.

Postoperative Care:

Successful healing depends on comprehensive postoperative management.

Important aspects include:

- Warm, quiet recovery environment
- Appropriate nutrition
- Fluid therapy
- Antibiotics when indicated
- Daily wound monitoring
- Bandage care
- Controlled activity
- Regular radiographic evaluation

Physical rehabilitation should begin once sufficient healing has occurred to prevent muscle atrophy and joint stiffness.

Complications:

Potential complications include:

- Malunion
- Non-union
- Delayed union
- Osteomyelitis
- Implant failure
- Pressure necrosis
- Joint ankylosis
- Muscle contracture
- Flight impairment
- Refracture

Early recognition and appropriate intervention improve long-term outcomes.

Prevention:

Preventive measures include:

- Providing safe housing and appropriate cage design.
- Eliminating sharp edges and hazardous objects.
- Ensuring balanced nutrition with adequate calcium and vitamin D.
- Preventing obesity through proper diet and exercise.

- Educating owners on proper handling techniques.
- Minimizing environmental hazards for captive and wild birds.

Conclusion:

Avian fracture management requires specialized knowledge of avian anatomy, biomechanics, and surgical principles. Prompt stabilization, accurate diagnosis, appropriate fixation, effective pain management, and diligent postoperative care are critical for successful outcomes. Advances in external skeletal fixation, miniature orthopaedic implants, and rehabilitation techniques have significantly improved survival and functional recovery in both companion and wild birds. A multidisciplinary approach involving veterinarians, rehabilitation specialists, and bird caretakers ensures the best possible prognosis and enhances the welfare and quality of life of injured avian patients.