

**PROCEEDINGS OF THE
NORTH AMERICAN VETERINARY CONFERENCE
VOLUME 20**

**JANUARY 7-11, 2006
ORLANDO, FLORIDA**



SMALL ANIMAL EDITION

Reprinted in the IVIS website (<http://www.ivis.org>) with the permission of the NAVC.
For more information on future NAVC events, visit the NAVC website at www.tnavc.org

CLINICAL AND SURGICAL APPROACH TO COMMON DISEASES OF PET RODENTS

Vittorio Capello, DVM
Clinica Veterinaria S.Siro
Clinica Veterinaria Gran Sasso
Milano, Italy

TAXONOMY AND SPECIES

Rodents belong to the Order of Rodentia, the largest mammalian order. They are grouped into three suborders based on anatomical and functional differences of their jaw muscles, namely the Miomorph (Miomorpha, “rat-like” or “mouse-like”), the Sciuromorph (Sciuromorpha, “squirrel-like”), and the Hystrichomorph (Hystriochomorpha, or Caviomorpha, “porcupine-like” or “guinea pig-like”) rodents.

The most common rodent species kept as pets among the porcupine-like rodent group are the Guinea Pig (*Cavia porcellus*), the Chinchilla (*Chinchilla laniger*) and the Degu (*Octodon Degus*).

The common species among the Rat-like rodents are the Rat (*Rattus norvegicus*), the Mouse (*Mus musculus*), the Hamster—including the Golden or Syrian Hamster (*Mesocricetus auratus*) and the Russian hamsters (*Phodopus* spp.)—the Gerbil (*Meriones unguiculatus*), and the Duprasi (*Pachyuromys duprasi*), also called the “fat-tailed gerbil.

A few squirrel-like rodents may be encountered as pets, and include the Prairie Dog (*Cynomys ludovicianus*), the European Citellus (*Citellus citellus*), also named “dwarf” prairie dog and the Chipmunk (*Tamias striatus*, *Etamias sibiricus*).

CLINICAL EXAM

A detailed history must be taken prior to the physical examination. As small rodents generally interact less with their owners, the veterinarian must be aware that owner observations are typically incomplete or even inaccurate. Not to say that this is wrong. The history must always include a review of husbandry and nutrition, especially for porcupine-like rodents, which are true herbivores.

Depending on the species, physical examination can be challenging. Of the porcupine-like rodents, guinea pigs and chinchillas can be handled easily, while degus, are more difficult to restrain. Guinea pigs and rabbits under stress are prone to a “freeze or flight” response. The former is encountered more frequently in ill animals. In general, these animals tend to hide signs of illness, making detection of problems more difficult.

The rat-like rodent species are usually quiet and easily examined, especially if handled frequently by their owners. In general, squirrel-like rodents are much more difficult to restrain and handle. Chipmunks and other species of squirrels almost always require sedation for complete physical examination and owners should be informed of this at the moment the appointment is scheduled.

OTHER DIAGNOSTICS

Radiology, hematology and clinical chemistries, urinalysis, ultrasonography, cytology, histopathology and culture/sensitivity tests are very important diagnostic tools for medicine and surgery of pet rodents, as well as for other exotic pets. With few exceptions (usually the larger and quieter animals) sample collection must be done under general anesthesia. Radiograms of pet rodents must be very good to excellent quality for adequate interpretation. High-resolution films and cassettes such as mammography films are highly recommended, especially for smaller rodents.

Phlebotomy techniques used in laboratory rodents are often not considered feasible or humane for pet rodents. The preferred site for venipuncture is usually the cranial vena cava, performed under general anesthesia with the exception of very ill and depressed patients.

COMMON DISEASES OF PET RODENTS

Diseases of pet rodents are extensively described in the literature. This paper focuses on the most important and/or peculiar disease for the selected species of pet rodents.

Dental disease on both incisor and cheek teeth is very common in all species. This topic, as well as common diseases of pet guinea pigs, are discussed in detail in these Proceedings.

CHINCHILLAS

Gastrointestinal bloat and/or stasis are common, especially when nutrition is less than ideal. This subject is covered in this Proceedings under working up the anorectic guinea pigs, as features of the disease in these species are similar.

Treatment of skin diseases (mostly dermatomycosis and fur barbering) are very challenging in chinchillas due to the heavy and dense fur. Chinchillas are less prone to pododermatitis than guinea pigs. Male chinchillas can develop a small but firm hair ring at the base of the penis. The fur ring causes paraphimosis, and sometimes the fur ring is hidden under the prepuce. Clinical signs are nonspecific. The chinchilla may frequently groom or lick the inguinal area, but sometimes the only clinical sign is depression. For this reason, clinical examination of male chinchillas should always include inspection of the penis under the prepuce. The fur ring has to be removed gently, without the use of scissors. Anesthesia may be required for this procedure.

Although ovarian cysts are not frequently reported as in guinea pigs, uterine disease has been documented, therefore therapeutic or preventive ovariohysterectomy is recommended.

Fractures of the tibia and fibula are commonly seen in chinchillas. Osteosynthesis using an external fixation device can be a good option for this traumatic lesion.

RATS AND MICE

The most common medical disease of rats is respiratory disease complex. *Mycoplasma pulmonis* and *Streptococcus pneumoniae* are two commonly implicated infectious pathogens. Treatment often involves prolonged general antibiotic therapy and nebulization with antibiotics and mucolytics, and is sometimes unrewarding in chronic cases.

The most common disease involving the integumentary system and its related organs is fibroadenoma of the mammary glands, which occurs in both in males and females. Tumors may grow to considerable size, and be present anywhere along the mammary chain from the thoracic to the inguinal area. The elective therapy is mastectomy. Since the prevalence of mammary tumors is lower in spayed rats than in intact females, ovariectomy is recommended in this species, either as preventive surgery or in combination with mastectomy. Growth of some experimentally-induced rodent mammary tumors are stimulated by estrogen, therefore ovariectomy may represent a way to decrease incidence, or be useful as an adjunct to tumor removal. Practitioners anecdotally report mixed success when ovariectomy is performed after tumor growth is already established.

Most causes of alopecia and dermatitis are associated with fur mites (see also hamsters).

Chromodacryorrea is commonly seen in rats and mice. The reddish staining around the eyes that characterizes this condition is due to the hypersecretion of porphyrins by the Harderian glands following stress, overcrowding or other pathologic conditions. For this reason, the clinician should not consider this clinical sign as a primary pathology. Owners commonly present these animals for hemorrhagic ocular discharge, but the color is due to red-pigmented porphyrins, not blood. The treatment consists of cleansing of the eyes, plus treatment of any underlying disease.

Necrosis of the tail is common in small-sized rodents with a long tail, like mice and gerbils. The lesion is hypothetically due to low environment humidity predisposing to skin dehydration and aseptic necrosis, which occurs spontaneously without other clinical signs. This is different from the tailslip that is experienced when a rodent is grasped by the tip of the tail. Tail amputation is the best choice of treatment.

HAMSTERS

Among infectious diseases, proliferative ileitis (commonly called "wet tail") is the most common and well known. It affects mostly golden hamsters. Clinical signs and symptoms include liquid diarrhea, weakness, anorexia, dehydration, hunched posture following abdominal pain, coma and death. A peracute clinical form resulting in sudden death may sometimes be seen, especially in young animals. The subacute clinical form is less common and can be associated with bowel intussusception and rectal prolapse. The etiology is multifactorial, and many genera of bacteria are involved (*Proteus*, *Escherichia*, *Clostridium*, *Campylobacter*). The

main feature on pathologic examination is ileal hemorrhagic enteritis. Prognosis is guarded to poor. Fluid therapy and treatment with antibiotics are mandatory). Force feeding is extremely important to prevent hypoglycemia and dehydration in anorectic hamsters.

Demodectic mange is very common in golden hamsters. Usually, the disease appears mild and nonpruritic, but it can be more severe if complicated by bacterial dermatitis. Demodectic mange typically becomes clinically relevant with stress, age, or concurrent diseases. The identification of Demodex (*D. criceti*, *D. aurati*) is indicative but not pathognomonic, because up to 50% of hamsters may be asymptomatic. Sarcoptic and notoedric mange show typical clinical signs, with very intense pruritus and thick crusts on the skin, particularly around the nose and upper lips, ears and genitalia. It is caused by *Sarcoptes scabiei*, *Notoedres cati* and *Notoedres muris*. While demodectic mange is poorly responsive, recovery from sarcoptic and notoedric mange is usually complete after treatment with Ivermectin 500 micrograms/Kg subcutaneously.

Dermatomycosis is also fairly common also in pet hamsters.

Polycystic disease may occur in many different organs, the liver being the most frequently affected. Hepatic cysts contain a transparent or reddish-colored liquid. The size of the cysts can range from a few millimeters up to more than 2.5 cm. in diameter. Clinical signs and symptoms are related to increased abdominal pressure, but the hamster is usually presented for an enlarged abdomen. Therapy is palliative and consists of drainage of the cysts, best performed with the hamster under general anesthesia. Recurrence is expected in 2-4 weeks.

Diseases of cheek pouches include impaction, prolapse, abscessation and neoplasia. Impaction is often the result of feeding of inappropriate food, or using cotton, paper or other improper bedding materials. Cheek pouch prolapse due to overfeeding is relatively common in Russian hamsters (Figure 1). Retained food becomes adherent to the mucosa of the cheek pouch, and during emptying the pouch prolapses along with the food. If the prolapse is recent and there are no lesions of the mucosal surface, reposition can be attempted, otherwise amputation is indicated.



Figure 1.

Fractures of the limbs are very common in hamsters and other small rodents, and often occur when they are dropped by the owner or limbs become entrapped in cage or wheel bars. The most common is complete fracture of the tibia and fibula. With the exception of comminuted fractures, intramedullary pinning can be successfully accomplished using the needle from 22 or 24 gauge intravenous catheters.

Skin neoplasia is very common in both golden and Russian hamsters, and surgical treatment is the only reported therapeutic option.

GERBILS

Nasal dermatitis similar to chromodacryorrhea occurs in gerbils. It is commonly called “sore nose”. With this condition, alopecia, erythema and crusts affect the skin area around the nose. This condition is due to hypersecretion of porphyrins, which are irritating to the skin, but repeated trauma are involved when the gerbils are housed in a wire cage and chew constantly at the wires, damaging the nose and the adjacent skin as well. This predisposing factor is demonstrated by complete recovery after the gerbils are moved into a plastic cage.

The gerbil (like the Russian hamster) has a normal alopecic area on the ventral midline, which is due to the normal presence of scent glands. These glands can be affected by ulcerations or neoplasia (Figure 2). General and local antibiotic treatment is poorly effective in cases of infection, therefore surgical excision represents the elective treatment for both these conditions.

Necrosis of the tail, as well as traumatic lesions when the gerbil is grasped by the tip of the tail, are common in this species.



Figure 2.

PRAIRIE DOGS

Clinical signs and symptoms caused by pseudo-odontoma of the incisor teeth are a very common presentation in prairie dogs. This disease is theorized to be a result of repeated or sudden traumatic injuries to

the incisors and their roots due to improper cage or husbandry. This dental abnormality is discussed elsewhere in these Proceedings.

Obesity is a result of improper nutrition and reduce activity. Prairie dogs are true herbivores, but are frequently fed a high-caloric diet including different kind of seeds, nuts, dog and cat food, fruit and other food more suitable for omnivores. Gastrointestinal stasis, with impaction of the stomach and/or the caecum is also a common sequela. Medical treatment is often unrewarding, while surgical treatment with gastrotomy or enterotomy for removal of impacted food carries a poor prognosis in prairie dogs.

Similar to gerbils, alopecia of the upper surface of the nose is common following excessive chewing of cage bars, and may resemble dermatomycosis.

MEDICAL TREATMENT

Supportive therapy is essential in every rodent patient showing reduced food intake or anorexia. The keys of medical treatment are presented in these proceedings under treatment of the anorectic guinea pig. When antibiotic therapy is indicated, species-specific contraindications to many common antibiotics must be taken in consideration as well as the choice and calculation of the proper dosage and administration route. A common complication of improper choice of antibiotics is fatal enterotoxemia.

SURGICAL TREATMENT

Surgical treatment of pet rodents, both preventive and therapeutic, requires proper knowledge of the basic principles of anesthesia and surgery of small mammals and microsurgery. The use of instruments and materials such as heat sources, a Doppler monitor for cardiac frequency, small transparent adhesive surgical drapes (Fig. 3), magnifying loupes, suture material smaller than 3:0, hemoclips, a radiosurgery unit, tissue glue and others are critical for these smaller patients.

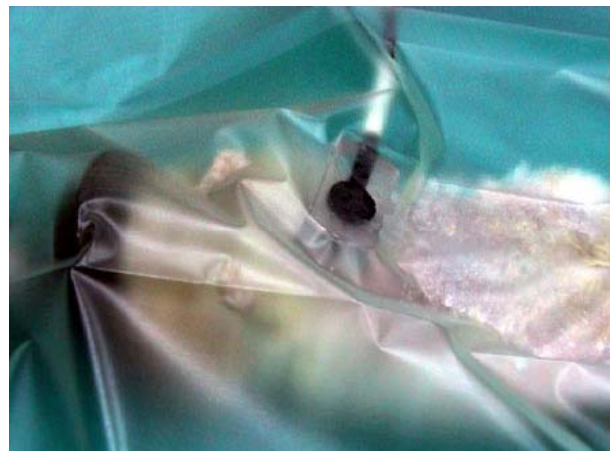


Figure 3.

References

1. Bennet RA, Soft tissue surgery. In Quesenberry KE, Carpenter JW, Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery (2nd ed.). Saunders, imprint of Elsevier Science, 2004; 316-328.
2. Bihun C, Bauck L, Basic anatomy, physiology, husbandry and clinical techniques. In Quesenberry KE, Carpenter JW, Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery (2nd ed.). Saunders, imprint of Elsevier Science, 2004; 286-298.
3. Capello V, Pet hamster medicine and surgery part III: infectious, parasitic and metabolic diseases. *ExoticDVM* 2002; 3.6:27-32.
4. Capello V, Common dermatologic disorders of pet rodents. *ExoticDVM* 2002; 4:1:33-37.
5. Capello V, Surgical techniques in pet hamsters. *ExoticDVM* 2003; 5:3:32-37.
6. Capello V, Gracis M, Lennox AM (editor), Rabbit and rodent dentistry handbook. Zoological Education Network, Lake Worth FL, 2005.
7. Donnelly TM, Disease problems of small rodents. In Quesenberry KE, Carpenter JW, Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery (2nd ed.). Saunders, imprint of Elsevier Science, 2004; 299-315.
8. Kapatkin A, Orthopaedics in small mammals. In Quesenberry KE, Carpenter JW, Ferrets, Rabbits and Rodents: Clinical Medicine and Surgery (2nd ed.). Saunders, imprint of Elsevier Science, 2004; 299-315.
9. Silverman S, Tell AL: Radiology of Rodents, Rabbits and Ferrets. An Atlas of Normal Anatomy and Positioning. Elsevier Saunders, 2005.