

# Caseous lymphadenitis caused by *Corynebacterium ulcerans* in the dromedary camel

Maria Teresa Tejedor, Jose Luis Martin, Pablo Lupiola, Carlos Gutierrez

**Abstract** — Caseous lymphadenitis that affected the dorsal and ventral superficial lymph nodes in the left cervicothoracic region of a young dromedary camel is described. The agent isolated was *Corynebacterium ulcerans*. To our knowledge, this is the first description of purulent lymphadenitis caused by *C. ulcerans* in a species belonging to the Camelidae.

**Résumé** — Lymphadénite caséuse causée par *Corynebacterium ulcerans* chez un dromadaire. L'article décrit une lymphadénite caséuse affectant les ganglions lymphatiques superficiels aux niveaux dorsal et ventral de la région cervicothoracique gauche d'un jeune dromadaire. *Corynebacterium ulcerans* a été l'agent isolé. À notre connaissance, il s'agit de la première description de lymphadénite purulente causée par *C. ulcerans* chez une espèce appartenant aux camélidés.

(Traduit par docteur André Blouin)

Can Vet J 2000;41:126–127

An 11-month-old, male dromedary was presented for examination of a ganglionic enlargement that affected the dorsal and ventral superficial lymph nodes in the left cervicothoracic region. The animal was from a herd of 48 dromedaries (31 females and 17 males). According to the owner, similar lesions were frequent in young animals of the herd. The lymph nodes were aspirated aseptically and a thick, viscous fluid and cream-white material were recovered. These samples were cultured on sheep blood agar and incubated under aerobic conditions with increased CO<sub>2</sub> concentration. Colonies were barely apparent at 24 h; by 48 h, white, creamy, umbonate colonies had developed. Gram staining of the colonies revealed pleomorphic, gram-positive, non-sporulated, curved rods, irregularly grouped. The bacteria were nonmotile, catalase- and urease-positive, and pyrazinamidase-negative. They did not reduce nitrate to nitrite. The bacteria fermented glucose, maltose, trehalose, and soluble starch, but not salicin, mannitol, or xylose. A phospholipase D test was positive. Gelatine hydrolysis was positive at 25°C but negative at 37°C.

Identification of the isolated bacterium was based upon morphology, cultural characterization, and biochemical reactions. It was differentiated from *Actinomyces pyogenes*, because *A. pyogenes* is catalase- and urease-negative. Among the corynebacteria, only *C. pseudotuberculosis*, *C. diphtheriae*, and *C. ulcerans* are pyrazinamidase-negative; however, of these, only *C. pseudotuberculosis* and *C. ulcerans* are urease- and phospholipase D-positive. *Corynebacterium ulcerans* ferments trehalose and soluble starch, while *C. pseudotuberculosis* fails to do so. Accordingly, the bacterium isolated was *C. ulcerans*.

Antibiotic susceptibility tests were made by the disk diffusion method in blood agar. *Corynebacterium ulcer-*

*ans* was resistant to oxacillin and susceptible to gentamicin, cephalothin, penicillin G, clindamycin, erythromycin, rifampicin, ampicillin, tetracycline, cefotaxime, vancomycin, sulfamethoxazole-trimethoprim, and ciprofloxacin.

Caseous lymphadenitis in the dromedary, as seen in sheep and goats, is produced by *Corynebacterium pseudotuberculosis*, a common disease affecting the camel in many countries in the world (1). In samples from these abscesses, it is common to isolate, in addition to *C. pseudotuberculosis*, *C. renale*, *Streptococcus* spp. (Lancefield B group), and *Staphylococcus* spp. (2). Radwan et al (3) isolated *Staphylococcus aureus*, *Rhodococcus equi*, *Shigella* spp., and *Escherichia coli* in similar cases. Other outbreaks of pseudotuberculosis in Bactrian camels have been associated with *Histoplasma farciminosum* (4).

To our knowledge, caseous lymphadenitis caused by *C. ulcerans* in a camelid has not been reported in the veterinary literature. Equally, it seems important that other bacteria associated with lymphadenopathies were not isolated in this study. On the other hand, the age of the animal (11 mo) is not in accordance with caseous lymphadenitis in camels caused by *C. pseudotuberculosis*, which occurs in animals over 3 y of age (Schwartz and Dioli, 1992, cited in reference 1).

*Corynebacterium ulcerans* causes infection of the bovine udder, with intermittent excretion of the organism in the milk (5). Human infections vary from symptomless to diphtheria-like and are usually associated with the consumption of raw milk (6). *Corynebacterium ulcerans* has also been isolated from bite wounds and cervical abscesses in monkeys (7) and from numerous cases of gangrenous dermatitis in captured ground squirrels (8). CVJ

## References

1. Wernery W, Kaaden O-R. Infectious Diseases of Camelids. Berlin: Blackwell Wissenschafts-Verlag, 1995:62–64.
2. Domenech J, Guidot TD, Richard D. Les maladies pyogènes du dromadaire en Éthiopie. Symptomatologie-Étiologie. Rev Elev Méd Vét Pays Trop 1977;30:251–258.
3. Radwan AI, El-Magawry S, Hawari A, Al-Bekairi SI, Rebleza RM. *Corynebacterium pseudotuberculosis* infection in camels (*Camelus*

Department of Microbiology (Tejedor, Martin, Lupiola), Department of Internal Medicine (Gutierrez), Veterinary Faculty, Universidad de Las Palmas de Gran Canaria, 35416 Las Palmas, Spain.

Address correspondence and reprint requests to Dr. M.T. Tejedor.

*dromedarius*) in Saudi Arabia. Trop Anim Health Prod 1989;21: 229-230.

4. Dalling T, Robertson A, Boddie G, Spruell J. Diseases of camels. In: Dalling T, ed. The International Encyclopaedia of Veterinary Medicine, vol 1. Edinburgh: Green and Son, 1966:585.
5. Hart RJ. *Corynebacterium ulcerans* in humans and cattle in North Devon. J Hyg 1984;92:161-164.
6. Barrett NJ. Communicable disease associated with milk and dairy products in England and Wales: 1983-1984. J Infect 1986;12: 265-272.
7. Smith GR, Eastman SF. Bacterial diseases. In: Parker MT, Collier LH, eds. Topley & Wilson's Principles of Bacteriology, Virology and Immunity. 8th ed. vol. 3. London: Edward Arnold, 1990:78.
8. Olson ME, Goemans I, Bolingbroke D, Lundberg S. Gangrenous dermatitis caused by *Corynebacterium ulcerans* in Richardson ground squirrels. J Am Vet Med Assoc 1988;193:367-368.

**INDEX OF ADVERTISERS  
INDEX DES ANNONCEURS**

Alternatives By Cowan, Inc. ....	159
American Animal Hospital Association .....	88
Anitech Enterprises, Inc. ....	160
Benson Medical Industries, Inc. ....	160
Canadian Council on Animal Care.....	157
Clark Cages, Inc. ....	123
Daniels Pharmaceuticals .....	152
EffectiVet.....	160
EIDAP Inc. ....	159
Gallant Custom Laboratories, Inc. ....	159
Hill's Pet Nutrition Canada Inc. ....	82
Hoptech Inc. ....	159
Ideal Instrument.....	159
Invisible Fencing Company, Inc. ....	159
IVMS .....	160
La Boit, Inc. ....	160
Lebalab Inc. ....	123
Merck Publishing Group.....	81
Merial Canada, Inc. ....	92, OBC
Novartis Animal Health.....	IFC, 151, IBC
Palliser Animal Health Laboratories, Ltd. ....	158
Pet Perfection Inc. ....	127
Pfizer Animal Health Inc. ....	87, 89
Potruff & Smith Insurance Brokers, Inc. ....	158
Practice One Management Consultants .....	158
Respirecare.....	159
Schering-Plough Animal Health, Inc. ....	116, 137
Terry A. Jackson.....	160
The Handpiece Clinic.....	160
Thornell Corporation .....	160
University of Guelph .....	157
Université de Montréal .....	155, 156
University of Saskatchewan .....	155, 158
Ultrasonic Services Ltd. ....	159
Versa Uniforms .....	123
Wilson, Jack & Grant .....	158

The participation of advertisers in the CVJ is an indication of their commitment to the advancement of veterinary medicine in Canada. We encourage our readers to give their products and services appropriate consideration. — Ed.

Le support des annonceurs démontre leur engagement pour l'avancement de la médecine vétérinaire au Canada. Nous vous encourageons à prendre connaissance de leurs services et produits. — NDLR



**Pet Perfection Inc.**  
Veterinary use only

**Veterinary Consultants**

Alan Robinson, DVM  
Carl Middlebrook, DVM

Is proud to include  
**SYNERMUNE™ BOVINE COLOSTRUM**  
in our line of nutraceutical products.

- Enhancement and stimulation of the immune system
- Increases the animal's ability to combat pathogenic bacteria, viruses, fungi and parasites.
- Immunoglobulins bind and agglutinate invading pathogens, preventing effective colonization and infection.
- lactoferrin slows growth of bacteria, attacks bacteria and viruses and stimulates the cellular immune response.
- Oligosaccharides prevent bacterial adhesion to G.I. epithelium
- Cytokines stimulate activity of B- and T-cells.
- Growth factors in colostrum initiate the growth and differentiation of cells of the intestinal epithelia, ensuring that the lining of the tract is healthy, resulting in improved absorption of nutrients.

**SYNERMUNE™ BOVINE COLOSTRUM**

is an integral component  
in Pet Perfection's:

<i>Immune Therapeutic</i>	<i>Digestive Blend</i>
<i>Immune Maintenance</i>	<i>Probiotic Paste</i>
<i>Pediatric Health Tabs</i>	<i>Joint formula</i>
<i>Anti-Parasite</i>	<i>Equine Joint Formula</i>

**SYNERMUNE™ BOVINE COLOSTRUM**

(min. 30% Ig)

*"Successfully used world-wide in a variety of animal species"*

Guaranteed Quality & Potency  
Obtained from USDA Grade A Dairies  
Cruelty free  
Produced Under Human Food Grade  
Quality Control Regulations  
Free of Antibiotics

<b>Available at:</b>	<b>Represented by:</b>
Vet Purchasing	Central Sales Ltd.
C.D.M.V.	Pacific Veterinary
W.D.D.C.	Sales

Pet Perfection Inc. Stoney Creek, ON

Toll Free: 1-888-844-6656

Tel: (905) 664-8686 Fax: (905) 664-8191

www.pet-perfection.com