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Skin Abscesses in Livestock and Deer: Description and Treatment[1]

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This publication is primarily intended for livestock producers and deer farmers raising white-tailed deer in Florida. However, the information it provides may also be valuable to producers nationwide who encounter similar challenges.

Introduction

Skin abscesses are a common health concern in livestock characterized by the accumulation of pus within a confined tissue space. There are several types of abscesses that can form almost anywhere on an animal's body, but most commonly occur superficially or just beneath the skin. This publication focuses on superficial abscesses in deer and other livestock. It discusses their causes and methods for prevention and treatment. These lesions are frequently associated with bacterial infections following minor trauma, skin lesions, or parasitic penetration. On many occasions, abscesses can form at injection sites. While often localized, abscesses can lead to systemic illness, economic losses, and complications in meat inspection and processing. Please note: all information in this publication is for educational purposes only. For advice, diagnosis, or treatment, always consult a veterinarian.

What Causes Abscesses?

A superficial abscess is formed when skin integrity is compromised, and bacteria or other pathogens are introduced to the tissue. This can be through a wound, foreign body puncture, or injection. The most prevalent pathogens implicated in livestock and white-tailed deer abscess formation are listed below and appear in Figure 1.

Corynebacterium pseudotuberculosis

Corynebacterium pseudotuberculosis is the primary agent of caseous lymphadenitis in small ruminants. This bacterium primarily targets regional lymph nodes and has a strong tendency to cause abscess formation, both internally and externally, depending on the species and the chronicity of the infection. *C. pseudotuberculosis* commonly causes superficial abscesses, particularly in sheep, goats, and horses. It has also been documented in various species of deer, including white-tailed deer and red deer.

Staphylococcus aureus

Staphylococcus aureus is a common pathogen associated with skin infections in a wide range of species. In livestock, it is a frequent cause of superficial abscesses, particularly when the skin barrier is compromised or damaged. These abscesses typically appear as painful, localized swellings filled with purulent material (pus), and are most often found at sites of trauma, such as wounds, deep scratches, cuts, injection sites, or areas of mucosal entry such as the mouth and nose (specific sites in the body where pathogens, antigens, or foreign substances can gain access through mucosal surfaces).

Trueperella pyogenes

Trueperella pyogenes is a bacterium characterized as nonmotile, facultatively anaerobic, and Gram-positive pus-forming. *T. pyogenes* is an opportunistic microorganism that affects various livestock species, particularly ruminants. While it is more commonly associated with deep-seated infections such as mastitis, pneumonia, and liver abscesses, it can also cause superficial abscesses, especially when introduced through skin wounds, injection sites, or the umbilicus. These abscesses are typically painful, warm, and filled with thick, opaque, foul-smelling pus, often forming at trauma sites. *T. pyogenes* frequently acts as a secondary invader, colonizing damaged tissues and sometimes co-infecting with other pathogens. It is implicated in cutaneous abscesses in cattle, sheep, goats, pigs, and deer.

Fusobacterium necrophorum

Fusobacterium necrophorum is an anaerobic, Gram-negative bacterium that primarily causes necrotic and suppurative infection in livestock. While it is more commonly associated with deep tissue and mucosal infections, it can also contribute to superficial abscess formation, particularly when skin integrity is compromised. It is a major pathogen in conditions such as foot-rot in sheep and cattle, liver abscesses in feedlot cattle, and calf diphtheria. It thrives in low-oxygen, damaged tissues.

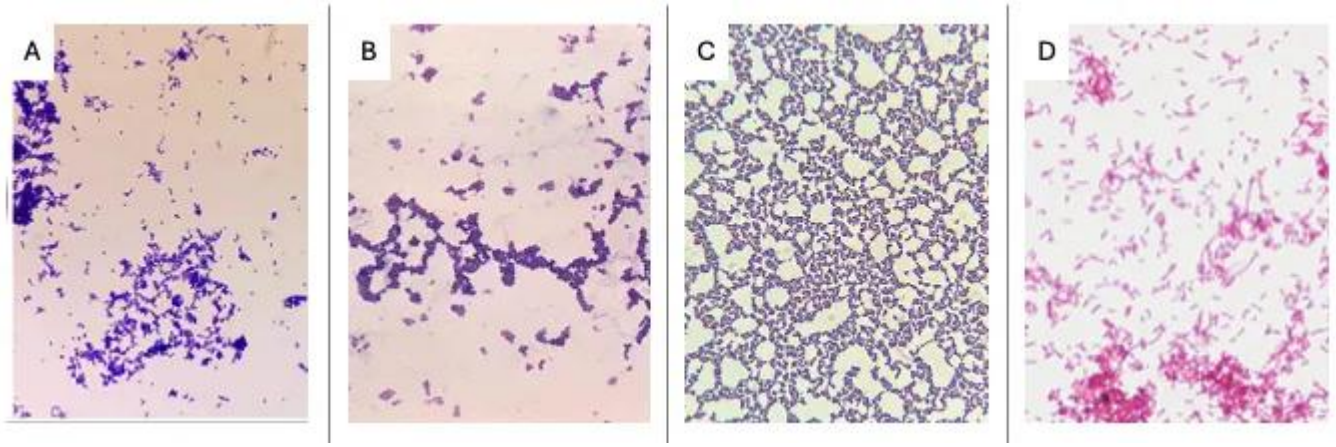

Figure 1. Common pathogens causing skin abscesses in ruminants. Each image is of a Gram stain representing A) *Corynebacterium pseudotuberculosis*, B) *Staphylococcus aureus*, C) *Trueperella pyogenes*, and D) *Fusobacterium necrophorum*.
Credits: A) © 2023 Meng, Chen, Huang, Yang, Zhang, Zhong, Zhou, Liu, Fu, He, and Peng; B) © 1980 Facklam CDC; C) © 2024 Kim, Ji, Park and Choi; D) © 2024 Ibrahim, Fox-Lewis, and Correia.

In superficial infections, *F. necrophorum* often acts in synergy with other bacteria, such as *Trueperella pyogenes*, and is typically found in trauma-related wounds, particularly in moist, contaminated environments like the interdigital spaces of hooves. Lesions involving *F. necrophorum* are often malodorous, purulent, and associated with necrosis, and though not as commonly isolated from simple cutaneous abscesses such as *Staphylococcus aureus* or *T. pyogenes*, its role in complex or chronic wound infections and soft tissue abscessation is significant.

Superficial Abscesses

These are subcutaneous swellings that are easily visible and can be felt upon examination (Figure 2). They often result from external trauma that produces a lesion on the skin, which may become infected by bacteria. Improper injection techniques, such as reusing needles or selecting incorrect injection sites, are a common cause that leads to localized abscess formation. Further information on livestock injections and vaccines can be found in the additional information section.

Clinical Presentation and Diagnosis

A superficial abscess in an animal typically progresses through several distinct stages. Initially, during the early inflammatory stage, the affected area becomes warm, swollen, and painful, often accompanied by redness due to localized vasodilation and infiltration of immune cells. As the infection advances, it enters the suppurative stage, where pus begins to accumulate, consisting of dead white blood cells, bacteria, and tissue debris. During this phase, the swelling becomes more prominent, and the center may soften and fluctuate under pressure. If untreated, the abscess may reach the maturation or encapsulation stage, where a fibrous capsule forms around the pus to contain the infection. Eventually, the abscess may spontaneously rupture, draining pus and potentially relieving pressure, or it may require surgical lancing and drainage. Healing follows with granulation tissue formation (a new connective tissue with microscopic blood vessels that form during the healing process to fill in the wound bed), and if managed properly, the area may heal with minimal scarring. It is essential that the lesion heals from inside out. However, complications such as secondary infections or chronic fistula, which are abnormal channels or passages that connect a fluid-filled area, such as a nodule or infection site, to the skin's surface, can occur if the abscess is not fully resolved. In some cases, systemic signs such as fever, anorexia, and weight loss may be observed.

The diagnosis is generally based primarily on clinical examinations. However, further testing such as bacterial culture and antibiotic susceptibility testing could be recommended in cases of persistent or recurrent abscesses, especially when antimicrobial therapy is indicated.

Therapeutic Management

Surgical Drainage and Debridement

Once the abscess matures, lancing under sterile conditions is the preferred method of treatment. Drainage should be followed by flushing with sterile saline solution (0.9% sodium chloride) or properly diluted antiseptics such as chlorhexidine or iodine-based solutions.

Further details on how to properly incise and drain an abscess in livestock, can be found at the end of this article.

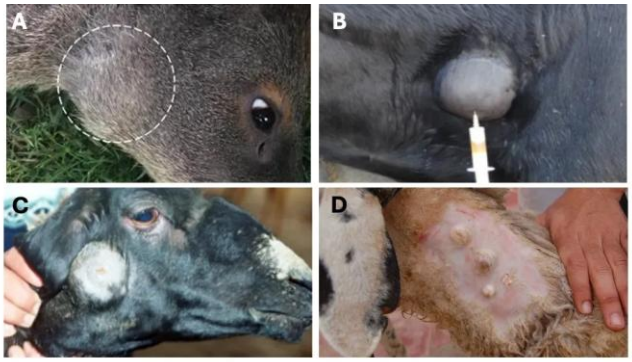

Figure 2. Common abscess presentation in ruminants. Displayed are four common presentations of abscesses in livestock. Panel A) is a superficial abscess caused by *Trueperella pyogenes* on face of a Pudu deer. Panel B) represents the most frequent presentation of an abscess, a large swollen area under the skin with defined edges and a pronounced head. In this panel, the abscess is being aspirated. Panel C) represents a clinical abscess but on the head of a goat. Panel D) displays caseous lymphadenitis in a goat caused by *Corynebacterium pseudotuberculosis.* Credits: Panel A: © 2020 Llanos-Soto, González-Muñoz, Opazo-Capurro, et al; Panels B and C: © 2020 Misk, El-Sherry, Misk.; panel D: © 2013 Mahin.

Antimicrobial Therapy

Systemic antibiotics are indicated when an infection is extensive, located deep beneath the skin, or has become systemic. The selection of an appropriate antimicrobial is typically made empirically by a veterinarian or technician, guided by clinical judgment and experience. Commonly used antibiotics include penicillin, oxytetracycline, and ampicillin, along with newer antibiotics approved for use in livestock, such as Tulathromycin (Draxxin®), Gamithromycin (Zactran®), Enrofloxacin (Baytril®), and others. Most antibiotics are regulated by federal law, which restricts their use to licensed veterinarians or those acting under their direction.

Supportive Treatment

Non-steroidal anti-inflammatory drugs (NSAIDs) may be administered to reduce pain and inflammation. Isolate infected animals to prevent transmission in herd settings.

Prevention and Control

Preventative strategies include:

- Maintenance of hygiene in housing and equipment.
- Proper wound care and immediate treatment of injuries.
- Use of sterile technique during injections or procedures.
- Quarantine of new or symptomatic animals.
- Vaccination against *C. pseudotuberculosis* in endemic areas.

Keeping the environment clean and checking the animal's health regularly are important steps to prevent abscesses from happening or coming back. Additionally, it is essential to collect, clean, and disinfect any fluid or pus that has leaked onto the ground or floor. Skipping this step can lead to the area becoming contaminated, which increases the likelihood of future infections and problems.

How to Incise and Drain an Abscess in Livestock Properly

The following instructions are for informational purposes only. For advice, diagnosis, or treatment, always consult a veterinarian. The University of Minnesota College of Veterinary Medicine provides an excellent guide on this procedure with narrated videos that can be found here: Abscess – Large Animal Surgery.

1. Prepare the Equipment

- Sterile scalpel or surgical blade (any size works well)
- Antiseptic solutions (for example, chlorhexidine or povidone-iodine)
- Clean towels or gauze
- Gloves (preferably sterile)
- Syringe with flushing solution (sterile saline or diluted antiseptic)
- Optional: local anesthetic (lidocaine) and sedation if the animal is large or stressed
- Protective clothing for the handler

2. Restrain the Animal Safely

Use a chute, halter, or the help of an assistant to safely restrain the animal. For deer, full chemical immobilization is recommended to ensure safety for both the animal and handler.

3. Locate and Assess the Abscess

Confirm that the abscess is mature: it should feel soft/fluctuant (fluid-filled) and warm, and it may be bulging. Do not lance the abscess before seeking veterinary advice if it is hard, small, or deep. Small, hard, or deep abscesses may not be ready, and they may involve vital structures.

4. Clean and Prepare the Site

Clip away hair around the swelling if needed, and thoroughly disinfect the area with antiseptic, following instructions on the label. Make sure to wear gloves to prevent exposure to possible pathogens and protective eyewear or a face shield in case the abscess bursts.

5. Make the Incision

Locate the lowest point on the abscess to allow gravity drainage. Using a sterile scalpel, make a clean, vertical incision about 3–5 cm long through the skin and abscess wall. The optimal size of the incision will vary depending

on the size of the abscess. Allow the pus to drain freely. Be cautious, as pressure can cause it to spray. Avoid cutting over joints or where scarring could interfere with movement or cause damage to underlying structures.

6. Drain and Flush

Let all the pus drain out. Gently press around the abscess by hand to help it drain completely and irrigate the cavity with sterile saline or a diluted antiseptic solution using a syringe or catheter.

Do not use hydrogen peroxide inside the abscess. Hydrogen peroxide is cytotoxic to healing tissue, which means it can damage or kill cells, hindering the healing process.

When cleaning a lanced abscess, the safest and most effective solution is warm normal saline (0.9% sodium chloride), which is non-toxic and promotes healing by gently flushing the cavity. For additional antimicrobial action, diluted povidone-iodine (for example, 1:10 with sterile water) or diluted chlorhexidine (around 0.05%) can be used cautiously on the surrounding skin, but these solutions should not be used in deep wounds.

These solutions provide broad-spectrum antimicrobial coverage without significantly harming tissue healing. Avoid using harsh substances like hydrogen peroxide, full-strength iodine, alcohol, or undiluted chlorhexidine. They can damage healing tissue and slow down recovery. In most cases, good drainage and gentle cleaning with saline or a properly diluted antiseptic are the most effective ways to support healing.

7. Post-Drainage Care

Leave the incision open to allow continued drainage; do not suture or staple it closed. If possible, the cavity should be flushed daily for several days or until drainage ceases and monitored for signs of infection or recurrence.

Optional: Antibiotic and Supportive Therapy

Systemic antibiotics are only necessary if the infection is spreading or systemic signs (for example, fever, lethargy) are present. Non-steroidal anti-inflammatory drugs may be administered to reduce inflammation and pain.

If any drug is used, make sure to follow withdrawal period recommendations if the animal is for meat or milk production.

When to Call a Veterinarian

- If the abscess is deep or located near sensitive organs or joints
- If the animal becomes febrile or lethargic, stops eating, or loses weight
- If the abscess does not resolve or comes back frequently

Conclusion

Skin abscesses in livestock represent a manageable yet economically relevant health issue. Early identification, proper treatment, and strategic prevention are essential components of effective control.

Additional Information

Livestock Vaccines: Principles, Types, and Important Factors to Consider at ask.ifas.ufl.edu.

Foundational Small Ruminant Management and Husbandry at ask.ifas.ufl.edu.

Abscess Drainage Video at open.lib.umn.edu.

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