

chronic infections. The majority of drugs available, sulfas and antibiotics, can be used for only relative short-term therapy. Isoniazid is unique in that it offers a relatively safe and economical drug for long-term therapy in chronic infections. At our hospital we used Isoniazid seven to eight years ago for the treatment of third phalanx osteomyelitis in horses so I was familiar with its use on a limited basis.

In my practice I use the drug in the treatment of "chronics," diphtheria, actinomycosis and cellulitis or traumatic pharyngitis in cattle. Since Isoniazid is odorless and relatively tasteless, it is readily accepted in the feed, although in my initial treatment I prefer to administer the drug with a balling gun.

Concerning chronic bovine respiratory distress, *Corynebacterium pyogenes* is a secondary invader especially when pneumonia is chronic and it usually causes abscessed lungs. When the decision is made to turn an animal into the chronic pen or to forego our routine treatment program, my treatment is as follows:

1. 60,000 units procaine penicillin G per pound of body weight IM
2. 5 mg of Isoniazid per pound of body weight *per os*

This treatment is used for five days at which time the Isoniazid tablets then are put in the feed, either crushed or

left whole. This treatment seems to work better for smaller feedlots, background lots or farmer feeders; as they can hand feed their chronics. The megadose of procaine penicillin G is used because 78% of the nasal secretions from feedlot cattle with pneumonia are sensitive to procaine pen G. The withdrawal from slaughter I am using is 20 days.

Any diagnosed cases of actinomycosis and cellulitis or traumatic pharyngitis are also put on the Isoniazid treatment of 5 mg per pound of body weight for at least 14 days, in addition to other treatments.

Therapy with Isoniazid has been used for as long as 30 days. Side effects with long-term usage are primarily a deficiency of vitamin B-6 and elevated SGOT indicating potential liver damage.

The Isoniazid I use comes in a 300 mg tablet (1000 tablets per bottle), therefore a 480# calf requires only 8 tablets. My cost per day to treat a 480# calf is 8¢. Currently I am using Bolar Pharmaceutical Co., Inc., Copiague, New York 11726.

The basis of my talk is that here is a drug that is antibacterial with penetrating ability into fibrous tissue. To me, Isoniazid is indicated in chronic respiratory, soft tissue and bone infections in cattle and is definitely an economical addition to my treatment regimen.

Teat Surgery—Stainless Steel Staples

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Teat surgery can be one of the most rewarding services a veterinarian can offer to a dairyman. However, one must use care in selecting the proper cases when attempting surgery. The owner must also be selected and be advised as to the proper aftercare.

After a few years in practice, most veterinarians have adopted certain principles on considerations when attempting teat surgery. To inform the owner of the prospective outcome is of utmost importance. Remember that once a teat or its sphincter is injured, it will never be quite as functional as before. I insist on help from the owner when attempting teat surgery, not only for restraint of the cow, but also to relay the proper aftercare instructions. One cannot be too careful with asepsis during all surgeries. This includes a clean and sanitary surrounding during and after surgery.

Choosing the correct time to open an occluded teat is equally as important. This should always be done only when the gland is lactating, full of milk, and preferably in the morning so that the owner may strip on the teat periodically (every 15-20 minutes) during the day. Use of dilators following sphincter surgery is discouraged.

I have no doubt purchased every teat instrument that has been invented for opening teats. Today, however, I carry

only a blunt teat bistoury (Lichty), a sharp teat bistoury, a mosquito forceps, an alligator forceps, a Moore's teat dilator, a lamb emasculatome, and a surgery pack containing retaining milk tubes and an automatic stapling gun. Restraint is usually accomplished with the head pulled to one side by a halter or nose tongs and the owner applying pressure on the tail. Occasionally an epidural is necessary or a ring block of the teat with lidocaine. Xylazine (Rompun) is used only in extremely nervous individuals.

The majority of teat surgeries may be classified in four categories; namely, the opening of the occluded teat, correcting a teat fistula, suturing a lacerated teat, and the removal of super-numerary teats.

In ninety-five percent of the occluded teats, I use a blunt teat bistoury to weaken the damaged sphincter with one cut. The less damage one may do while opening the teat, the less formation of scar or connective tissue will result. The use of curette or drill bit to widen the streak canal only results in the formation of more scar tissue. This is my opinion.

When suturing was required in the early years of my practice, I used a non-absorbable material in the skin closure such as silk, nylon non-filament fish line, or vetaphil. All worked quite well and can be used today. More recently I

have employed stainless steel staples. With the advent of the automatic stapling guns, suturing a lacerated teat, repairing a teat fistula, or removing an extra teat from a springing heifer is really a pleasure and much faster.

Procedure—Lacerated Teat

1. Proper lighting.
2. Ring block the teat at the base of the udder with Lidocaine. Use Rompun if extremely nervous.
3. Scrub and Disinfect udder and teat. Use Nolvasan or tamed Iodine.
4. If wound is not fresh (2 hours), debride the edges of the wound until hemorrhage occurs.
5. Suture inside mucosa with 3-0 catgut if wound is more than 2.5 cm. Be sure to bring knots to the outside.
6. Apply steel staples to skin.
7. Insert a retaining milk tube.
8. Infuse quarter with an antibiotic tube.
9. The cap of the milk tube is usually not replaced between milkings, especially in cows with heavy production so no pressure builds up within the teat.
10. Antibiotic infusion instilled daily.
11. Remove staples with the instrument in 7 to 8 days.
12. Remove milk tube when staples are removed.

Procedure—Teat Fistula

1. Repair of teat fistula is best accomplished when dry.
2. Procedure for preparation—same as above.

3. Debride fistulous tract with a Bard-Parker Knife or scissors. Apply staple.
4. No retaining milk tube needed when dry—only when lactating.
5. Infuse a dry cow antibiotic tube into the quarter.
6. Remove staples in 10 days.

Procedure—Supernumerary Teats (Dry cows or springing heifers.)

1. Procedure for preparation—same as above.
2. Remove extra teat by cutting longitudinally with the udder, not laterally. The scar will blend with the folds of the udder.
3. Staple with stainless steel.
4. No retaining tube needed.
5. I have done this within 10 days of calving and had them heal by first intention.
6. Staples work extremely well on webb teats—a fifth teat superimposed on the side of a normal teat.

Two other suggestions in teat surgery.

1. Small lacerations may be put into apposition and held with the use of super glue—disposable tubes. This works better than tape. Put only on the skin, not inside wound edge.
2. Swelling in severely bruised teats may be removed with the use of a mixture of 3 oz. Domsol; 15 ml. dexamethasone; 15 ml chloramphenicol.

The Use of Tissue Adhesives in Teat Surgery

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According to the D.H.I.A. records for the state of Michigan in 1981, 3% of the cows removed from the herd were removed for udder related problems other than mastitis. Teat injuries and conditions that would require surgery are likely to be the most numerous.

Complications following teat surgery, whether it be elective or necessary as the result of trauma, are a failure to maintain an adequate teat diameter due to inflammation or scar synthesis.

The leakage of milk due to wound dehiscence and/or fistula formation, or the extension of infection into the mammary gland result in acute mastitis that is resistant to treatment or chronic mastitis with the resultant fibrosis.

The traditional methods for handling teat wounds have been by:

The excision of the torn away flaps, and trimming the wounds.

In some cases of fresh trauma and certainly with elective

surgery, suturing with various materials and patterns is practical and has been extensively used.

Grafts and special tape are also used in the repair of teat wounds.

Our investigation has been to try and introduce some new methods and materials into the handling of teat wounds. We investigated the use of adhesives of the cyanoacrylate class. We found that isobutyl cyanoacrylate and methyl cyanoacrylate were not readily available and were expensive. Duro Super Glue, which is an ethyl cyanoacrylate ester, is readily available and inexpensive. We have used this adhesive alone, with suturing, with taping, and with suturing and taping.

Super glue alone was used on some dry cows. For anesthesia we used 10 ml 2% lidocaine. 5 ml were used as a ring block and 5 ml instilled into the teat sinus. The equipment used included a scalpel, grooved director, elastator, small teflon coated spatula, and super glue. After