

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. Domoso; 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 cyanoacrolate class. We found that isobutyl cyanoacrolate and methyl cyanoacrolate were not readily available and were expensive. Duro Super Glue, which is an ethyl cyanoacrolate 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

preparation and draping, the grooved director was placed through the streak canal into the teat sinus. A three centimeter incision was made through the skin, muscle layer connective tissue and mucosa into the teat sinus. Hemorrhage control was a problem until we started using the elastrator bands. By the use of the bands, hemorrhage can be controlled and most of the blood can be forced out of the teat and a dry field achieved which is necessary for the adhesives to form a good bond. A drop of adhesive is placed on the spatula and applied very thinly to the edge of the laceration. The two edges should be placed in tight opposition immediately and held for 30 seconds. A light application of the adhesive is then applied to the skin over the edges of the wound. The elastrator band is allowed to remain in place for 3 to 5 minutes after gluing, at which time it is cut and taken off.

Complete healing usually took place in two weeks. Some of the skin edges separated more than others but healed dry.

The next case will show the use of super glue in the repair of a teat that has been injured and healed so that the teat orifice was against the wall of the milker inflation and did not milk out.

Following the usual preparation, the fibrotic scar was

removed and the skin edges freshened. With an elastrator band in place a light application of the adhesive was applied and the wound surfaces held in opposition for thirty seconds. A light coating of glue was applied to the edges. Interrupted sutures of prolene 2-00 were placed in the skin to hold the flap and the teat orifice in place. A larson test tube was placed in the teat to support the repair. Tape was applied as a dressing and further support. Healing was by first intention and was complete at freshening time.

Adhesive with tape was used to repair a teat fistula in a dry cow. Many of the udders are infected and it is good practice to culture and test for antibiotic sensitivity before electing to do surgery. After thorough preparation including the instillation of a larson teat tube, the fistulous tract was excised and hemorrhage controlled. Adhesive was thinly applied and the edges held in opposition for thirty seconds. With the elastrator band in place adhesive tape was spirally applied. A larson teat tube was left in place and the cap removed. The elastrator band was cut and removed.

Antibiotic solution was instilled into the quarter once a day for 10 days. The larson tube was removed. The tape was removed in two weeks.

## Don't Under-rate T.B. Testing

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We have a three man practice just outside Phoenix. The average herd size is about 500 cows and it is exclusively dairy practice. Why I asked to present this talk is that we had a couple of herds that had T.B. about 3 years ago and because of my experience in school and some of the experiences I had before I went to Arizona I thought it was worthwhile to talk about TB testing. The experience I had in school was there was no such thing as TB and you would never see a TB reactor! In first practice in New Hampshire I found a couple of reactors to the caudal fold test. I called the state veterinarian and he said, "don't worry about it." No problem. So I didn't do anything about it.

In researching the articles that were published about these two herds I found that there has been some TB in the United States. So it is a disease that is around. I thought we were unique, but there have been some herds depopulated in the last couple of years because of TB.

The first herd that we encountered was in April, 1979. Unfortunately, I was the one to do the previous test on this herd in 1976 and all the cows at that time were negative to the caudal fold test. On this test in April, 1979 there were 28 reactors out of 326 animals tested. In this particular herd these reactions were so gross that you could probably diagnose them from a pickup truck driving down the highway a half a mile from the dairy! The reactors can have

small reactions. I called the state veterinarian and said I had 28 reactors. This was more than normal. I was running less than 1% reactors at this time and I said this is a pretty high percentage of reactors. He said, "probably due to some strange thing." The federal veterinarian came out and did the comparative cervical test and they were all positive and he also said, that it was probably just some strange deal and nothing significant. We contacted the person that developed the comparative cervical test and he said the test was fairly accurate. So they slaughtered these 28 animals. Nineteen had lesions and 9 were condemned at slaughter. About 60 days later, they came out and did the .22 cervical test which is a test they do on the entire herd to determine which animals they are going to pay an indemnity on and they did it on all the animals, all the way down to baby calves—409 of the 618 animals that they tested reacted and 104 of those animals had lesions. Three non-reactors also had lesions so the test is not 100 percent either way for sure. Another interesting factor is that they found that 46 people had been exposed to this herd in the recent history by virtue of drinking raw milk. One of the 21 they were able to find was positive for TB test. About 2 years later I had a phone call from a fellow that had been a herdsman on this dairy about 6 months previous to the time of the test. He was a herdsman on a dairy in Michigan and he said he had TB. "Is it true that the dairy I