Retained Placenta: Causes and Treatments

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▪ Retained Placenta - Epidemiology and Economics

Retained placenta is defined as the failure to pass all or part of the placenta from the uterus within 24 hours of calving. There are several potential causes for placental retention but the effects on the general health of the cow and her subsequent reproductive performance are costly events to the dairyman. The following data include both obvious cases of retained placenta and those of cows sick with metritis with or without obvious placental retention. Retained placenta or metritis requiring systemic therapy occurs in 11 to 18 % of calvings (1, 5, 13, and 16). Cows with toxic early lactation metritis may die and the case fatality rate was estimated from our records at 1% and reported to be 1.5% in 29 California herds (7). Cows not achieving economical milk production and culled due to RP was estimated to occur in 6% of cases (1). We estimate that veterinary examination and treatment occurs in 10% of cases. The time required for veterinary effort was estimated at .25 h. Treatment with systemic antibiotics occurs in 75% of cases (our estimate) with a drug cost of $15. Farmer labor required for daily evaluation and the course of treatments was estimated to be 10 minutes per day for 4 days or .67 h. Bartlett (1) reported average milk discard for 7 d and a total of 102 kg. Milk not made due to RP was estimated to be 265 kg by DeLuyker (3) and 120 kg by Bartlett (1). The authors selected 250 kg milk loss due to RP. Delay in conception after RP has been reported to be 12 d by Halpern (9), 7 d by van Werven (16), 32 d by Borsberry (2), 19 d by Martin (11), and 12 d by Bartlett (1). The authors estimate that 15 d delay in conception is typical.

These losses are summarized based on the average cost per case as follows: deaths $18, immediate culls $49, veterinary fees $5, drug costs $15, farmer labor $7, milk discard of 150 kg $16, lost milk production of 250 kg $58, and delayed conception of 15 d $38. The total average financial loss per case is thus $206 and the average incidence is 15% of calvings for a typical loss of $3090 per 100 calvings per year.

▪ Causes of Retained Placenta

Retained placenta occurs after many cases of dystocia, with milk fever, and with many twin births. In most herds with good management these causes make up the majority of known risk factors for retained placenta and easily lead to the typical 15% incidence. There are occasional herd problems where the incidence is much higher than 15% without being obviously related to the 3 primary predisposing factors. Some of these herds have a problem with subclinical hypocalcemia and others may have selenium or vitamin E responsive problems. In most circumstances, the nutritional management of mature cows for proper body condition and minimal cases of milk fever will also minimize the occurrence of retained placenta. Proper growth rates resulting in heifers calving at 600 kg and selection of calving ease sires are the most important management considerations for prevention of retained placenta in heifers.

Induction of parturition with either corticosteroids, prostaglandin f-2 alpha, or both is sometimes used for management purposes. The incidence of retained placenta is usually about 75% following induced calving.

Why is the placenta retained?

The finger-in-glove fit of the placental cotyledons in the maternal caruncles provides the large surface area necessary for nutrient and gas exchange between maternal and fetal circulations. Collagenase secreted by the placenta at parturition leads to a weakening of the mechanical link between uterus and placenta. The mechanical actions of uterine contraction and compression of the placentomes loosen and begin the separation. After parturition, the shrinking of the cotyledons as the blood drains from the placenta normally allows the now smaller fingers of the placenta to slip from the glove of the caruncles. Mechanical events, inflammatory events, or bad timing due to delayed delivery can all lead to some edema formation in the caruncle and cotyledon that lock the placenta into the uterus. This grip persists until necrosis (read rotting) of the devitalized placenta allows it to detach. Action of leukocytes migrating from the caruncles into the surface of the placenta hasten the necrosis. Some bacteria hasten the necrosis but may also lead to systemic illness for the cow.

▪ Treatment of Retained Placenta

Several trials of interventions after calving have attempted to reduce the incidence of retained placenta. Oxytocin has long been advocated to expel the placenta after delivery. There are other advantages to the use of oxytocin after calving but it does not reduce the incidence of retained placenta. Oxytocin is already being secreted by normal cows at parturition and it helps contract the uterus and expel a placenta that is fully detached. The contraction of the uterus helps control bleeding from the various sites that may have been traumatized

during delivery. If the placenta is not detached from the caruncles oxytocin will not hasten its passage (12). Low rates of retained placenta during an experiment that required induction of calving was reported with the use of 10 mg of dinoprost tromethamine (Lutalyse, Pharmacia and Upjohn Co.) given within a few hours of calving (8). I conducted a trial in a client herd with 400 calvings to evaluate this as a prevention. There was no difference between the prostaglandin treatment and the placebo. A follow up trial was conducted with induced calvings and either dinoprost or cloprostenol and no reduction in the incidence of retained placenta was observed (6). The use of prostaglandins at parturition has yielded mixed results. The use of Lutalyse (Pharmacia & Upjohn) at calving does not reduce the incidence of retained placenta (14). However, the use of a longer acting prostaglandin, fenprostalene - no longer marketed in the USA, did result in a shorter duration of placental retention and a reduction in subsequent metritis (10). An experimental injection of collagenase into the placental end of the umbilical artery has been shown to facilitate separation of the placenta from the uterus (4). This mode of therapy is specific and appropriate for releasing the placenta from the uterus but has not evolved into a practical treatment.

Many medications have been placed into the uterus of cows with retained placenta. Veterinarians have sometimes devised very detailed protocols requiring sequential placement of antibiotics and other chemicals into the uterus on various days after calving. To date there is no data supporting the beneficial effects of intrauterine therapy for retained placenta. Some cows do not become sick, do not stink, and require no therapy whatsoever. Most cows do become systemically ill and require antibiotic and adjunctive therapy. The aim of therapy is both to minimize illness at the start of lactation so feed intake and milk production will get off to a good start and to reduce the reproductive inefficiency at the start of the breeding period.

I work with many large dairies where therapy of routine problems is administered by the herd staff under my guidance. To insure consistency in treatment programs, protocols have been developed to cover most common conditions including retained placenta and metritis. Fresh cow monitoring is a part of the daily routine on these dairies. Whether your dairy is large or small, the principles of systematic approaches to health problems will help insure that the right cows are treated and with logical interventions. The following is a portion of a typical herd protocol.

▪ Sample Herd Protocol

Fresh Cow Examinations

Lock up the fresh cows and observe their attitude about feed. Top dressing the TMR with good hay often makes lock-up easier.

- Check rectal temperature.
- Collect urine for ketone test.
- Observe for retained placenta or malodorous vaginal discharge.
- Check for a DA ping on left and right.
- Examine manure consistency.
- Check udder for mastitis.

Retained Placenta

Treatment is based on the degree of illness demonstrated by the cow. Take the cow's temperature daily. If the temperature is more than 39.7 give 40cc Penicillin or 15cc Excenel daily for at least 3 days. If the temperature remains elevated or the cow does not appear to improve after 3 days of Penicillin or Excerel switch to 60 cc of Oxytetracycline in dextrose IV once per day for 3 days. Some cows will be treated with antibiotics who do not have a fever, have no other problems identified, but are still "sick".

Place red leg bands on both rear legs.

- Milk holding time for Penicillin — 12 milkings (4 days)
- Milk holding time for Excenel — none
- Milk holding time for Oxytetracycline — 12 milkings (4 days)

Cows with poor appetite or mild ketosis will be pumped daily with Bubba Mix[1].

Put cow on the "Dump List" for prostaglandin injections every 14 days starting at 20 to 27 days.

One of the currently favored adjunctive treatments for retained placenta is estradiol cypionate or ECP (Pharmacia & Upjohn). This old product, labeled for use at 10mg per dose, was used for a variety of uterine and ovarian diseases

[1] Bubba Mix is a nutrient and electrolyte solution combined with 5 kg of alfalfa meal. It is mixed with 40 liters of warm water and administered with a McGrath pumping system or equivalent.

before the availability of prostaglandins and gonadotrophins. With the newer therapeutic hormone products finding efficacious uses, ECP was largely ignored. In addition, ECP was associated with infertility due to scarring of the oviducts and ovaries that was thought to be due to extrusion of infectious material from the uterus towards the ovaries. A practitioner from California, Dr. Lynn Upham, suggested it be part of the routine for early treatment of retained placenta at a recent meeting of the American Association of Bovine Practitioners. His recommended dose was 4mg on days 2 and 5 after calving. This therapy has been widely adopted by veterinarians throughout North America but has not been evaluated by appropriate clinical trials. The benefits of estrogenic stimulation of the uterus might be increased blood flow, greater recruitment and activation of leukocytes, and enhanced contractility of the myometrium. While these actions should be beneficial to a cow with a retained placenta the actual effect of extra estrogen is not known.

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