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| ***INTRODUCTION***  The mammary gland is a cutaneous gland and histologically, in advanced mammals it is a compound tubuloalveolar type that originates from the ectoderm.  Although the mammary gland is basically similar in all animals, there are wide species variations in the appearance of the gland and the relative amounts of the components secreted by it.  The location of the mammary glands differ in different species, but in mammals such as cattle, sheep, goats, horses, and camel the mammary glands are located in the inguinal region and are referred to as udders.  Dairy cattle are reared and bred for the sole purpose of producing milk, this is done as a business in order to maximize profits and production, but in order to do this, the cow need to have healthy and functional udders. With that being said, this concept map will highlight some of the defects of the cow’s teat and some methods of correcting them.  Diagnosis and treatment of teat disorders has advanced greatly over time. The most ideal suturing pattern for teat repair has been researched; radiography, ultrasound, and theloscopy have improved diagnostic capabilities; and surgical approaches have been refined to improve precision and reduce invasiveness. Obviously, not all of this equipment is readily available to many practitioners, but the changes in technique are applicable and useful.  ***Anatomy of the udder***  Anatomy +Udder+Cows+udders+have+four+compartments+with+one+test+hanging+from+each.+Cells+remove+water+and+nutrients+and+convert+it+to+milk..jpg***Figure-1-31-Cross-section-of-the-bovine-mammary-gland.png.jfif***  The bovine teat is composed of five primary layers to the lining of teat: the inner most layers of mucosa, submucosa, highly vascularised connective tissue, muscularis and the skin. Innervation of the udder is by fibres of the genitofemoral nerve. The cranial quarters are innervated by the ilioinguinal and iliohypogastric nerves. The caudal quarters are innervated by the mammary branch of the pudendal nerve and the distal branch of the perineal nerve.  The most important support of the udder is the median suspensory ligament (MSL). It divides the udder into right and left halves. The median suspensory ligament is composed of elastic tissue that stretches to allow the udder to expand as it fills with milk.  The lateral suspensory ligament (LSL) is chiefly fibrous and non-elastic. It extends along both sides of the udder and at the intervals send sheets of tissue into the gland to provide support to the inside contents of the udder. |
| **Physical Examination:**  Before any pre operative procedures can be done on an animal for udder surgery both the animal and its udder should be examined. So after physical examination of the animal, the udder and teats are examined with the following techniques:   1. Visual inspection to observe for color, shape, and size of the teat and the type and location of any lacerations present. 2. Careful palpation and rolling of the affected teat between thumb and fingers to determine if any pain is elicited as well as location and size of any obstructive tissue present. 3. Hand milk the animal to determine milk flow and to observe the milk for clinical mastitis. 4. Then carry out a California Mastitis Test to screen for evidence of subclinical mastitis, a strip cup can be used for procedure 3. 5. A sterile milk sample can also be taken and send to the lab for microbial and sensitivity testing if its suspected that a certain teat has mastitis. 6. The teat canal can be probed and the length measured using a cannula and this can also detect any strictures in the teat. |
| **INDICATIONS:**  Teat lacerations are common in dairy cows and can cause severe deficits in milk production.  Lacerations that do not penetrate the mucosa of the teat generally heal rapidly by secondary intention with the aid of topical medication and bandaging.  Teat lacerations that penetrate the mucosa of the teat require suturing to maintain normal teat function for milking and to prevent the development of teat fistulae or acute mastitis and loss of the quarter. As with any lacerations, early attention to the condition improves the success rate.  Another indication for teat laceration surgery is when there is an occurrence complete end obstructions of the teat. This can be congenital or acquired through trauma. |
| **TEAT LACERATIONS:**  • Teat lacerations are **categorized** as:  • Acute (less than 6 hours)  • Chronic (more than 12 hours old).  • Surgical intervention on the teat is best performed during the first 12 hours following the injury.  Teat lacerations are **classified** as:   * simple or complex (inverted “Y” or “U”),   • Longitudinal or transverse, and proximal or distal.  • The orientation of the blood supply of the teat is longitudinal.  • A transverse laceration results in more damage to the blood supply resulting in more edema, avascular necrosis and dehiscence post-operatively compared with a longitudinal laceration.  • The more circumference is involved, the worse is the prognosis.  • Distal injuries involving the streak canal are also regarded as having a poor prognosis.  • Proximal and transverse lacerations are difficult to repair. At this location, the mucosa is difficult, the suture and the teat swell more post-operatively.   * being partial thickness (skin to submucosa)   • Full thickness (skin to mucosa with milk leaking out of the incision). |
| ***DRUGS AND EQUIPMENTS FOR ANAESTHESIA PREP:***  Xylazine Chloride Butorphanol  Lidocaine  NSAID (Flunixin Meglamine)  Antibiotic (Penstrep) |
| ***INSTRUMENTS:***  ***The procedure should be as aseptic as possible, therefore the instruments use should be sterilized.***     1. Cornell teat curette 2. and C- Hug’s tumor extractor 3. Teat bistoury 4. Device used to occlude the teat sinus and venous plexus. 5. Alligator Forceps  * Teat knife * Hug’s tumor extractors * Scalpel handle (#3) * Small metzenbaum * Scalpel blade (#10) * Absorbable suture with an atraumatic needle point (no. 3-0/4-0) * Non- absorbable suture (no.2-0) * Adson-brown tissue forceps * Teat cannula * Self-retaining teat tube * Doyen clamp * Gauze     Metal teat cannula    Metzebaum scissor |
| ***ANAESTHESIA PROTOCOL:***  The methods of restraint and anesthesia are important in any teat surgery because the repair must be meticulous. A tilt table, ideal for restraint but it is generally not available to most practitioners because they have to deal with teat lacerations in the field.  Xylazine hydrochloride is a useful means of restraining the cow in lateral recumbency for teat surgery.  Many surgeons prefer positioning the cow in dorsal recumbency for teat procedures. Butorphanol (0.5 mg/kg) may be added for very fractious animals.  If the cow’s disposition is good, teat surgery may be attempted with the cow in the standing position using local anesthesia.  Physical restraint: The cow can be restrained in a stanchion with a halter on and a nose lead. The cow’s front and hind legs can be restrained with rope.  However, results are more predictable if the cow is tabled or cast and are neither uneasy nor kicking. Local anesthetic can be injected around the base of the teat (circle or ring block) is the most common technique for anesthesia.  Topical anesthetic can be infused directly into the teat canal to supplement ring block anesthesia. For topical anesthesia, 2% lidocaine (not procaine) should be used. Epidural anesthesia is an effective alternative for teat surgery. To control hemorrhage and milk flow, a rubber tourniquet may be applied to the base of the teat. Doyen forceps clamped across the base of the teat can also be used successfully.  When lacerations involve the base of the teat, suturing has to be performed without the benefit of a tourniquet. The udder and surrounding teats should be washed thoroughly. Harsh disinfectants should be avoided because they can cause further tissue necrosis if they contact the lacerated tissue. The affected teat can be draped with a slit drape, so it protrudes from the opening in the drape. Once the borders of the laceration have been assessed carefully, a prognosis can usually be given.  Extra info and references:  \* teat cistern infusion with local anaesthetic, inverted V-block, ring block, or intravenous regional anaesthesia of the teat may be appropriate  <http://wildpro.twycrosszoo.org/S/00Man/VeterinaryTechniques/PainRumIndTech/Local_Analgesia_Teat.htm>  \*Perineal nerve block may be used for surgery on the caudal teats and the escutcheon of the udder.  <http://wildpro.twycrosszoo.org/S/00Man/VeterinaryTechniques/PainRumIndTech/Perineal_block_Rum.htm>  **OTHER TYPES OF TEAT BLOCKS:**   * Inverted “v” block over the surgical area * Teat cistern infusion * Vascular (local) infusion technique   loo.PNG |
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