

Surgical Restoration Of Breeding Bulls

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Surgical Pathology of the Reproductive Organs

Injury or disease involving the reproductive tract of bulls is a significant cause of economic and genetic loss to cattle producers. An abattoir survey of 550 bulls in Northern Australia found that preputial (prolapse 3.1%, abscess 0.54%, papillomatosis 0.18%) and penile injuries (persistent frenulum 0.36%, hematoma 0.54%, fractured penis 0.18%, abscess 0.18%) were common. Spitzer *et al* examined 862 yearling bulls and found that 109 failed breeding soundness examination. Abnormalities in the 109 yearling bulls included persistent penile frenulum (16.5%), fibropapilloma (1.8%), and penile abnormalities (1.8%). Chenoweth *et al* found breed differences in the occurrence of abnormalities of the reproductive tract. Herefords had larger and firmer seminal vesicles, Brahmans had testicular hypoplasia more frequently, Brahmans had smaller seminal vesicles, Shorthorn Hereford cross cattle had more preputial ulcerations, and Brahman cross cattle had preputial prolapse more frequently.

Surgical Pathology of the Prepuce

Injury of the prepuce is most commonly observed in pasture breeding bulls, but bulls maintained in semen collection facilities occasionally suffer these injuries as well. The prognosis for bulls with preputial injury varies greatly with the location and type of injury. The most common lesions include preputial prolapse, laceration, abscess, trauma, avulsion, and adhesion or fibrosis. Congenital lesions include persistent frenulum and preputial stenosis. Desrochers *et al* found that success rate for surgical correction of preputial injury was best when the penis could be extended at surgery (88% vs 36% if extension was not possible), if a posthioplasty could be performed (90% vs 43% when circumcision was required), and when surgery was performed under general anesthesia in a clean surgery suite (100% vs 63% for surgeries performed under injectable or local anesthesia). Sexual rest of at least 60 days is enforced by isolation housing.

Preputial lacerations may be treated medically or by a combination of medical and surgical therapy. The most common mistake in surgical treatment is performing surgery too soon after injury (since essentially all injuries are infected by the time they are diagnosed). **I prefer to treat preputial wounds for anywhere from 10 to 60 days before performing surgery.** Patient selection for surgery is the primary determinant of the success of the procedure. The bull is sedated (xylazine, acepromazine, etc), a local block done (ring block, pudendal nerve block, xylazine epidural, etc) and restrained or is placed under general anesthesia (triple drip, halothane, etc). The penis is extended and grasped with towel forceps placed between the apical ligament and the tunica albuginea proximal to the glans penis. Small lacerations may be locally excised and sutured closed. Larger lacerations and circumferential scars require circumferential posthioplasty. Posthioplasty is performed by dissecting the superficial epithelium and damaged tissue free from the underlying elastic layer of the prepuce. Two circumferential incisions are made, one proximal and one distal to the damaged tissue. Then, these incisions are connected by a longitudinal incision and the epithelium elevated. The two remaining end of the prepuce are sutured together using No 2-0 PDS or chromic gut. In cattle with extensive preputial damage which prevents exteriorization of the penis, a circumcision, or preputial amputation, is indicated. Preputial amputation is done by placing overlapping mattress sutures around the based of the affected portion of the prepuce after which the damaged segment is amputated. After surgery, a preputial retaining tube is taped onto the prepuce and is left in place for 10 to 14 days after surgery. Antibiotics are administered for 10 days after surgery.

Kasari *et al* described a decision analysis model for the cost-effectiveness of treatment of bulls with preputial problems. Based on an assumed success rate of 59% for medical therapy and 85% for surgical treatment, the decision to cull was more economically advantageous. This model makes several critical assumptions that should be considered when using it for

clinical decision analyses. These include that the bull's genetic value can be replaced, that the injured bull will only be used for 2 breeding seasons after recovery, that the bull is used in a single breeding season per year, and that treatment will be performed at a hospital facility (potentially higher costs than on-farm treatment).

Surgical Conditions of the Penis

Persistent frenulum and penile hematoma are the two most common abnormalities for which surgery is indicated. Vascular shunts and penile deviations are less common. Resection of a persistent frenulum can be performed with the bull standing or recumbent. I prefer to perform this surgery with the bull recumbent and restrained on a tilt table. The bull may be held off feed for 12 hours prior to surgery and sedated with xylazine HCL (0.05 mg/kg body weight, IV) and acepromazine (0.03 mg/kg, IV). The penis is extended and the frenulum grasped at its attachment to the penis and prepuce. Then, the frenulum is resected using Mayo scissors. Bleeding is usually minimal, but may be controlled using electrocautery or suture ligation. The bull should be rested for 10 to 14 days before breeding activity is resumed. Penile hematoma is usually seen in inexperienced bulls and is caused by impact of the penis with the cow's perineum during maximal engorgement. This causes dorsal bending of the penis particularly opposite the attachment of the retractor penis muscles. This results in extremely high pressures within the corpus cavernosum penis (exceeding 400 lb/in²) occasional rupture of the CCP. The rupture arises from the dorsal or crural canal and tunica albuginea of the CCP (not the dorsal artery of the penis).

A penile hematoma forms dorsal to the distal sigmoid flexure and is located proximal or immediately cranial to the base of the scrotum. Rarely, penile hematoma may be seen ventral to the penis, at the mid-body of the penis, or may cause disruption of the urethra. The penile hematoma prevents extension of the penis initially because of the space occupying mass and later because of adhesions to the penis. Surgical intervention has proven most successful for large penile hematomas. Musser *et al* reported success rates of approximately 80% for either surgical or medical treatment of penile hematomas < 20 cm diameter. Hematomas that were > 20 cm diameter had success rates of 75% after surgery and 33% after medical treatment. Surgical management is best performed with the bull under general anesthesia to optimize sterility. If the penile hematoma becomes infected, the prognosis decreases to near 0%. I place all affected bulls in which treatment will be done (medical or surgical) on procaine penicillin G (22,000 U/kg, IM, 10 days), phenylbutazone (5 mg/kg, po, 10 days), and warm water hydrotherapy (BID, 30 minutes, 10

days). Monitoring should include observation for preputial prolapse secondary to venous congestion and dependent edema caused by the hematoma. Vascular shunting of blood out of the corpus cavernosum penis or occlusion of the CCP may cause failure of penile erection and impotence. Vascular shunts are diagnosed by positive contrast corpus cavernosography. Surgical treatment of vascular shunts is difficult but Young *et al* had a 50% return to service after resection of the affected portion of the tunica albuginea. However, several of these bulls required multiple surgeries to achieve success.

Penile deviations may include spiral, ventral, and S-shaped deviations, all of which are caused by abnormalities of the apical ligament of the penis. Two surgical techniques have been described for reinforcement of the apical ligament: 1) apical ligament splitting and interweaving and 2) fascia lata autografting. I do not recommend apical ligament splitting and interweaving (longitudinal incision in the apical ligament followed by isolation of a 2 mm wide portion of the ligament which is threaded onto a needle and passed through the tunica albuginea in a bootlace or interweaving pattern) because this technique may result in the formation of vascular shunts. I use the fascia lata autograft because the technique is simple, easy to perform if the bull is anesthetized, has a good success rate, does not promote vascular shunts, and has worked well for me (thanks to Dr. Wolfe who has advised me in the use of this technique!). A 2-cm wide, 20-cm long segment of fascia lata is obtained from the craniolateral aspect of the thigh. Then, the apical ligament is divided on the dorsal midline to expose the tunica albuginea. The autograft is customized to the dorsal penis and sutured to the tunica albuginea using 3-0 monocryl (or 2-0 PDS). The apical ligament is sutured back and anchored to the autograft. Sexual rest of a minimum of 60 days is enforced for all surgeries of the prepuce and penis.

Seminal Vesiculitis

Seminal vesiculitis is a common finding in young bulls during pre-breeding soundness examinations. Septic seminal vesiculitis (wbc's in semen, positive bacterial culture, poor semen characteristics) has a low response to medical therapy (parenteral antibiotics, intravesicular antibiotics, intravesicular caustic agents). Therefore, methods for surgical treatment have been developed. Surgical removal of the seminal vesicles has resulted in a fair prognosis for return to breeding soundness.

Unilateral Orchiectomy

Unilateral orchiectomy may be performed because of testicular trauma, septic orchitis or periorchitis, epididymitis or fibrosis, or as part of the treatment for

unilateral scrotal hernia. Unilateral orchiectomy caused no significant change in semen characteristics in 9 healthy bulls. Unilateral orchiectomy returned 5 of 8 (63%) bulls with testicular abnormalities to breeding soundness.

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Abstract

Fatal marijuana poisoning in cattle

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Marijuana, the narcotic produced from *Cannabis sativa*, is considered a weak poison for animals. Marijuana toxicosis is not rare in dogs that have access to the drug, although many cases probably go unreported because of legal implications. Clinical signs in dogs resemble those seen in humans: odd behaviour, weakness, tremors, incoordination, salivation and nausea.

A Brazilian veterinary scientist reported a case of marijuana toxicosis in five cattle that were grazed with access to mysterious, plastic-wrapped bales of dried leaves. The farmer believed the bales to be poor-quality hay. Signs of toxicosis started at about 20 h after ingestion and included muscle tremors, frothing from the

mouth, incoordination and reluctance to move. Four cattle died within 3 days. One survived without treatment.

Three of the cattle were necropsied and plastic bags were found in the rumens. Autolysis made detailed examination difficult but no inflammatory lesions were observed. Analysis of the forestomach contents revealed tetrahydrocannabinol in two of the cattle.

The author estimated that the cattle between them ate about 35 kg of marijuana. They were in poor body condition and the pasture contained little hay. Although it is not a strong poison, marijuana may be lethal to cattle if consumed in large quantities.