Ejaculation Failure/Dysfunction In the Stallion

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INTRODUCTION:

Ejaculation dysfunction and ejaculation failure, also known as anejaculation, in stallions can be frustrating for owners and challenging to diagnose the exact etiology.[8] Ejaculation can be divided into two components, seminal emission into the urethra and propulsion of the ejaculate. Dysfunction can occur at either of these stages.[4,7,12] Causes of anejaculation can range from physical pain due to lameness, urinary and reproductive system dysfunction, or psychological problems. The majority of cases of anejaculation can be attributed to musculoskeletal or neurological disease; whereas, the majority of cases with true ejaculation dysfunction can be attributed to urospermia.[1,3,7,8,9]

HISTORY AND PRESENTATION:

Typically, stallions will present for a breeding soundness exam with a history of poor reproductive performance, being difficult to collect, or having poor quality sperm.[8,2] A thorough history can help identify if the problem originated from a traumatic event or changes in handling leading to psychological problems in the stallion. Breeding stallions of any age can present for this problem. On presentation, the general appearance of the stallion should first be observed, and any obvious lesions, lameness, or asymmetry can be used to focus your work up from the beginning. Cases involving true dysfunction will often have no overt signs on initial presentation.[1,8,12]

PATHOPHYSIOLOGY:

To understand the disturbances of the ejaculation process it is important to understand the process itself. The normal ejaculation process begins with a reflex of emission stimulated by no

more than 9 thrusts following erection and intromission.[3] The cerebral cortex sends signals to stimulate the thoracolumbar reflex arc. This reflex initiates emission by stimulating alpha-adrenergic receptors to close the internal sphincter of the bladder, initiate the secretion of fluid from the accessory sex glands, and stimulate smooth muscle contractions which facilitate movement of sperm from epididymis to ampulla then into the urethra. The lumbosacral reflex via pudendal nerve produces rhythmic contractions of the muscles of the penis and other pelvic striated muscles to propel the semen out of the urethra. The anal sphincter also contracts at this time in a rhythmic fashion.[3,7,9] Prior to this process a psychogenic component takes places in the cerebral cortex, which leads to sexual arousal, erection, and initiation of ejaculation.[7,9]

Ejaculation dysfunction is disturbance of the process despite normal libido and erectile function.[3] Disturbances can be physical, physiological, or psychological in origin. Physical ailments can cause pain that overrides sexual arousal to inhibit ejaculation, or the defect may lead to contamination of the sperm, for example, hemospermia. Physiological issues are wide ranging among ejaculatory dysfunctions. Internal sphincter failure can be attributed to infection, injury, or pelvic neural control dysfunction. Testicular hypoplasia or degeneration and blockage of the excurrent ducts, whether in the epididymis or ampulla, result from physiological disturbances such as inflammation or age related changes.[7] With psychogenic issues, a traumatic event or mishandling has occurred during the breeding or the collection process, which makes the stallion associate ejaculation with the fearful event.[7,13]The reflex arc responsible for ejaculation requires priming from the cerebral cortex which can be overridden by fear and anxiety.[7,9]

DIFFERENTIAL DIAGNOSES:

Ejaculatory dysfunction is most commonly associated with anejaculation, but can also be due to azoospermia, urospermia, retrograde ejaculation, premature tumescence of the glans penis, and incomplete ejaculation.[1,3,7] Anejaculation is broken into two major causes: psychogenic and physical.[11] Psychogenic causes typically result from mishandling during breeding or collection or from a traumatic event that may have occurred previously during this process.[9,13] The most common physical causes are musculoskeletal or neurological problems. Lameness, ataxia, or incoordination can be the sole cause of ejaculatory failure. Other causes reported include vascular anomalies such as aortic thrombus decreasing blood flow to the hind limbs, gastrointestinal pain associated with colic or prior colic surgery, and lesions of the reproductive or urinary tract leading to hemospermia and/or urethritis.[11,12] These lesions can be due to trauma resulting in lacerations, bruising, or hemorrhage most commonly affecting the urethral process or are idiopathic in origin like a urethral rent which often leads to obvious hemorrhage during erection.[9,11,13]

Azoospermia is the complete absence of sperm within seminal plasma of an ejaculate. Two major categories include spermatogenic failure and obstruction. Spermatogenic failure is attributed to testicular hypoplasia in young stallions or testicular degeneration in older stallions. Obstruction can occur at multiple locations.[1,11] The most common obstruction is blockage of the ampulla either unilateral or bilateral.[7] Midline cysts of the colliculus seminalis have been reported as a cause of intermittent reproductive success with normal stallion behavior. These cysts can be present in asymptomatic horses or can cause problems by occluding the urethra or ampulla.[8] Even more rarely, there can be blockage occurring more proximal involving the vas deferens, epididymis, and efferent ducts of the testes.[11]

Other types of dysfunction include urospermia, retrograde ejaculation, premature tumescence of the glans penis, and incomplete ejaculation. Urospermia refers to urine contamination of the seminal plasma leading to subfertility or infertility.[7,9,13] This is a fairly common cause of ejaculatory dysfunction in stallions. There are some methods of managing this problem though no curative treatment is available as the condition is most commonly idiopathic.[9] Retrograde ejaculation is a specific cause of urospermia or can appear as azoospermia if the entire volume of the ejaculate flows retrograde into the bladder. Retrograde ejaculation is not common in the stallion but has been reported rarely.[2,7] Pre-mature tumescence of the glans penis makes intromission difficult often leading to anejaculation or pre-mature ejaculation outside of the female reproductive tract. The cause is unknown at this time, but pre-mature tumescence is seen more commonly in older stallions and stallions with underlying neurological disease. Incomplete ejaculation refers to emission without the propulsion necessary to expel the semen leading to dribbling of semen from the urethra. This dysfunction has been seen more often with electroejaculation and is not commonly observed in stallions.[3,7]

DIAGNOSTIC APPROACH/CONSIDERATIONS:

Many different components must be evaluated to determine the cause of ejaculation failure and dysfunction. Physical assessment of the stallion at presentation should be completed first to determine if any lameness or injuries exist. Following overall physical assessment, the collection process should be evaluated.[1,12] During collection the libido of the stallion is assessed along with his posture when mounting and thrusting. Lastly, evaluating if ejaculation is occurring through direct and indirect assessments. Indirect signs of ejaculation include pulsation of the urethra, flagging of the tail, treading on hind feet, and behavioral change following

dismount.[1] Direct assessment includes evaluation of semen for the presence of sperm or seminal alkaline phosphatase (ALP) levels.[1,10]

When the sample is azoospermic, a series of steps can then be taken to determine the cause. If the stallion appears to ejaculate from indirect evaluation, seminal ALP levels should be measured.[10] ALP levels between 6,913 and 22,180 IU/L are consistent with a normal stallion ejaculate.[1] Each testicle should then be evaluated for size and texture. If the testicles appear smaller than normal and are soft in texture, testicular hypoplasia or degeneration can then be furthered assessed by measuring hormone levels or testicular biopsy. Stallions that appears to ejaculate but have a low seminal ALP levels should be further evaluated for an outflow obstruction or retrograde ejaculation.[1] Rectal palpation and ultrasonography can be useful in determining causes of outflow obstruction such as, ampulla blockage or midline cysts of the colliculus seminalis. Urinary catheterization can be a useful diagnostic tool for determination of retrograde ejaculation.[1,9]

When there is failure of collection or the stallion does not appear to ejaculate, the entire collection process should be evaluated and manipulated. The libido of the stallion should be assessed during collection. Libido can be enhanced through teasing the stallion with multiple mares before collection, if they are accessible, or use of a jump mare. Next, evaluate handling of the stallion during the collection process, rough handling or poorly timed commands by the handler, can prevent timid stallions from collecting or breeding. Along with handling, the collection area is important, solid footing in a quiet environment is more conducive to success. The phantom can be adjusted to a shorter height to place less stress on the back and hind limb suspensory apparatus. The artificial vagina (AV) can be manipulated by changing the temperature, compressive pressure, model of AV, and position at which it is held. If there is still

no success, sensation loss should be considered.[1,9,12] A warm compress with pressure on the base of the penis can enhance tactile sensation; otherwise, allowing him to naturally service a mare will give him maximal sensation and remove the AV as a variable.[1,12] Usually, a sensation problem can be assessed visually as they have short thrusts and difficulty penetrating the vagina on their own.[1]

Finally, when other all options have been exhausted, chemical ejaculation can be attempted.[1] Different pharmacological agents have been studied to encourage ex copula ejaculation including alpha adrenergic agonists and beta adrenergic antagonists. However, the physiologic mechanisms of these pharmaceuticals on ejaculation are not fully understood.[9] Imipramine is a tricyclic antidepressant used to lower the ejaculatory threshold, which also has alpha-adrenergic effects. It is most commonly administered orally either 2 hours before collection at a dose of 500-1000 mg or twice daily for two weeks at a dose of 100 mg. It can be used alone or in combination with an alpha adrenergic agonist.[6,9] When evaluated critically, the most consistent results from chemical ejaculation were seen with a combination of oral imipramine at a dosage of 2.2 mg/kg 2 hours prior to intravenous administration of xylazine at dosage of 0.66 mg/kg.[6,8,9,12] Xylazine is used as the ejaculatory stimulating agent.[5,6,9] Typically, with this protocol ejaculation will occur within the first 30 minutes of the xylazine administration.[6,9] Chemical ejaculation can be useful in certain situations; however, the response is stallion dependent and success rates range from 30-75 percent.[9]

TREATMENT AND MANAGEMENT:

Treatment generally consists of managing the underlying cause of the ejaculation failure. A stallion whose dysfunction has a psychological component will benefit from behavioral

modification. These modifications include: only introducing the stallion to mares that are receptive, only introducing them to well-mannered mares, providing positive reinforcement during the breeding or collection process, and taking extra care that the environment is calm and comfortable for the stallion.[4,13] Pharmacological therapy has also been studied for these stallions by use of intravenous diazepam (0.05mg/kg) administered 5-7 minutes before breeding. It has been shown to reduce anxiety to allow for successful breeding.[9]

Surgery is recommended for an idiopathic urethral rent or extensive lesions needing surgical closure. Sexual rest is essential following surgery to allow lesions of the reproductive tract to completely heal. Systemic antibiotics along with topical therapy to the urethra will also assist the healing process. Management of urospermia can be difficult. Encouraging the stallion to urinate prior to collection by placing them in a freshly beaded stall can reduce the amount of urine present in the ejaculate. Furosemide may also be administered to promote urination. To further reduce urine contamination, allowing the stallion to ejaculate directly into semen extender aids by dilution. Collecting the ejaculate in fractions using an open-ended AV has also been successful in eliminating the urine contamination.[2,9,12,13] Pharmacological therapies to assist with closure of the internal urethral sphincter by alpha-adrenergic medications such as imipramine hydrochloride, phenylpropanolamine, and noradrenaline have been used with limited succes.[9]

Management techniques to make collection less painful have been useful in stallion suffering from osteoarthritis. Pain medication, such as phenylbutazone, given prior to collection combined with solid footing, lowering the height of the phantom, ground collection, use of bite straps, and weight loss management can all be used to enhance collection for a painful stallion.[4,9,12] Lateral support of the hips is useful in stallion that are unstable while mounting.

Manipulation of the AV and warm compress will enhance sensation. When all of these options have been exhausted, use of chemical ejaculation methods can be attempted to extend the breeding career of a valuable stallion but the individual variation in stallion response limits this management strategy greatly.[4,12]

EXPECTED OUTCOME AND PROGNOSIS:

The prognosis for ejaculation dysfunction is largely dependent on the type of dysfunction and the underlying cause. Lesions of the reproductive tract can have guarded to good prognosis, depending on the extent of damage, the complexity of therapy, and whether the stallion is given an adequate period of sexual rest. Idiopathic causes of urospermia have a poor prognosis for complete resolution because the underlying mechanism for urine contamination is rarely identified. However, stallions with urospermia can be managed successfully for breeding with the options discussed previously.[9,13] The prognosis is guarded for stallions with psychogenic ejaculatory dysfunction as these can be some of the hardest and most time consuming to successfully manage. The prognosis for causes of sperm accumulation syndrome is good with proper management such as frequently breeding or collecting.[12] The prognosis for other causes have not been discussed.

CONCLUSION:

Ejaculation dysfunction can be a frustrating situation for the stallion, the owner, and the reproductive professional. Cases usually present as a workup for a normal breeding soundness exam following poor reproductive performance or difficulty collecting. It is first important to

attain a good general and reproductive history and evaluate the stallion's overall appearance and behavior. Sexual arousal can then be assessed through teasing before collection. Collection is usually the limiting factor in determining the problem. Careful observation should be performed during this entire process. Based on the stallion's behavior and results of the collection, different diagnostic approaches can be used to narrow down the differentials and progress to a presumed or definitive diagnosis. Management and therapeutic options can be used for the committed owners but range from short-term sexual rest and environmental modification to extensive, long-term management. Ultimately, the value of the horse as a breeding animal often decides the amount of resources invested into his production of offspring. The prognosis is extremely variable ranging from poor to good depending on the cause of the dysfunction.

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