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New developments in ultrasound evaluation of the stallion’s reproductive system

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Ultrasound techniques have been used to evaluate the scrotum and internal genitalia in stallions for many years. Greyscale ultrasonography is a reliable tool for imaging testicular parenchyma, vaginal tunics, spermatic cord and epididymides. It allows accurate measurement of testicular dimensions important for calculating testicular volume, and expected daily sperm production. Pathological changes of the stallion testis, such as testicular tumours, hydrocele/haematoma, inguinal hernia and torsion of spermatic cord can be visualised using ultrasonography. More recent developments with colour-flow Doppler have provided useful information regarding normal and abnormal blood flow to the testis.

Colour Doppler ultrasound

Colour Doppler ultrasonography (CDU) of the stallion testis was introduced into veterinary practice several years ago. The technique is very useful for visualising the testicular vasculature in stallions and obtaining objective measures of testicular perfusion. We have described the application of this technique in detecting impairment of testicular blood flow in ageing stallions, in cases of mild torsion of spermatic cord and in severe hydrocele. Increased resistivity of the blood with obvious reverse blood flow in diastole was clearly seen in all cases. More recently, CDU and power Doppler imaging was used for monitoring changes in various scrotal pathologies, following physiological changes in testicular perfusion affected by season, as well as in detecting the effects of various treatments on testicular blood flow in stallions. This technique is a leading diagnostic method in assessing the degree of impairment of testicular perfusion, especially in cases with torsion of the spermatic cord. Clinically significant rotation of a scrotal testis is not as common in stallions as it is in man. Veterinary surgeons do not attempt salvaging affected testes due to the concern of potential damage to the contralateral testis. The breeding stallion has to produce large quantities of spermatozoa every year in order to meet the high demands of the equine industry while men are usually expected to father just a few children in their lifetime. Therefore, in man, the scrotum is usually explored if there is any indication of possible testicular ischaemia coming from the history, clinical appearance and CDU.

Transrectal ultrasonography

Transrectal ultrasonography (TRUS) is a well established method commonly used in the diagnosis of various pathologies of internal genitalia in men and stallion. This method plays an especially important role in the diagnosis of obstructive disorders of the ejaculatory apparatus in man and stallions. The main symptom of complete EDO is infertility associated with azoospermia, but also other symptoms include haematospermia or painful ejaculation. Partial obstruction may cause oligospermia or oligoasthenospermia. In rare cases, EDO may lead to necropermia with normal sperm numbers. Transrectal ultrasonography (TRUS) and TRUS-guided dynamic techniques have become a classic diagnostic modality for this condition in man.

There is a common belief in veterinary medicine that EDO in stallions is usually functional and has a transient nature. Theriogenologists often see stallions which have a tendency to develop occlusion of ampullae at the beginning of each breeding season. The majority of these can be successfully treated with oxytocin injection, transrectal massage and frequent multiple ejaculations. Common changes in semen include transient azoospermia, oligospermia or oligoasthenospermia. In some cases, accumulation of spermatozoa in the distal aspect of semen excurrent system in stallions may lead to formation of hard plugs which may occlude deferent ducts. These plugs, as well as dilatation of the terminal, ampullary portion of deferent ducts, can be visualised using TRUS. In addition, TRUS is often used in monitoring any changes in degree of dilatation of ampullae of deferent ducts after treatment and ejaculation. This modality has been useful in detecting the presence of various cystic structures in the pelvic region of the stallion.

The most common cystic structure seen in the stallion using TRUS is the uterus masculinus, which is a remnant of the Müllérian duct. This cystic structure is often seen between the terminal parts of ampullae and usually does not pose any problems. However, occasionally, it may be large enough to affect the processes of emission and ejaculation. We have recently described cysts detected in the pelvic urethra, caudal to the terminal portion of distal ampullae of the vas deferens. Subsequently, we have shown that this cyst is located exactly at the colliculus seminalis and may be a cause of EDO in stallions. We have seen a number of stallions with these cysts presented to our clinic. There were cases where this was only an incidental finding during a routine BSE, not associated with any ejaculatory problems. However, there were also some stallions with fertility problems, associated with poor semen quality and no other abnormalities found during clinical evaluation than midline prostatic cyst. The effectiveness of transurethral surgical procedures correcting physical obstructions of the ejaculatory ducts should also be explored in order to add to our treatment options for stallions with severe ejaculatory problems due to physical causes.

In summary, there continues to be progress in the development and application of various diagnostic and treatment techniques in human and veterinary andrology. ‘Human’ andrologists and equine theriogenologists should continue working on new developments in clinical andrology in addition to the new developments in semen analysis and processing.

Further reading