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Gelding: the unkindest cut?

Examining the benefits of and risks involved in castrating horses in training

One of my former trainers, Dave Thom, had a saying: "Give me a yard full of geldings and I'll give you a yard full of winners".

Towards the backend of the training season, significant numbers of colts have their testicles removed as they leave behind their two year-old careers. Most trainers perceive geldings to be easier to train than colts, and if they have not shown enough ability for a stud career to beckon by then, there is little to lose.

Once the horse is three, it is fully skeletally developed, although some would argue not totally mature, and removal of the reproductive 'tackle' will have little impact on growth or physique development. Geldings do tend to become lighter and lose some of the secondary sexual characteristics, such as the fat in the crest of the neck, so have their own particular appearance, but in terms of performance, they appear not to be handicapped.

In the National Hunt world the majority of horses entering training as 'stores' will already have been gelded prior to entering training. This is normally done at the end of the yearling year, either standing or following a short anaesthetic.

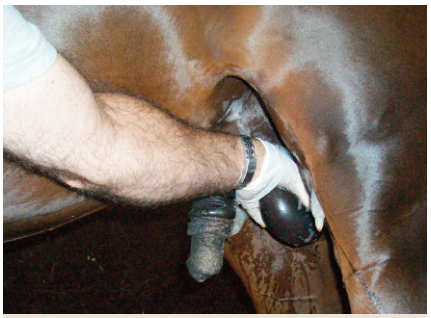
By and large, National Hunt stallions tend to be derived from the longer-distance staying pedigrees of Flat horses rather than because of proven prowess over jumps, and very few 'jumpers' are entire horses.

Once gelded, management of these horses becomes significantly more straightforward. Geldings can be turned out together in a field without fear of them injuring each other by fighting and can even be turned out with fillies or mares, although in some cases they can develop sexual behaviour subsequent to gelding, particularly following a change in location or mixing with horses who they have not been in contact with before.

There have been many 'what if?' stories, where regret is voiced that horses like the great Teleprompter, and indeed the last two winners of the Dubai World Cup, African Story and Prince Bishop, had been gelded, but these horses were transformed by the procedure, and may never have reached these heights left entire.

How is castration achieved?

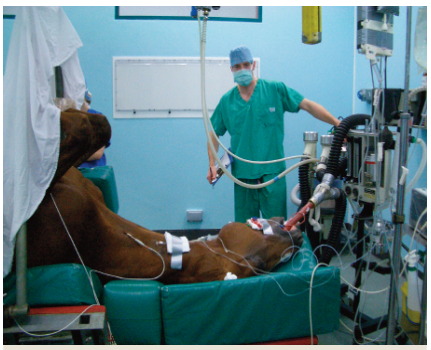
In most cases, racehorse castration is done standing under local anaesthetic with sedation and pain relief as necessary. The testicles and spermatic cords are first injected with local anaesthetic, which is allowed to 'cook' for about 15-20 minutes. Once the tissues are totally desensitised, then a slash incision is made into the scrotum. The testicle is exteriorised, and it is removed with an elaborate piece of surgical equipment called an emasculator. This instrument has a set of interlocking crushing blades with a cutting blade placed at the bottom of the array.



COURTESY OF BEN MASON-ROSSDALES

Standing castration about to be performed by the author. This is a 'clean' procedure, but by no means sterile. The wounds therefore have to be left open to allow drainage of potential infection

Once the testicular cord is clamped in the emasculator the testicle will usually fall off but the cord is retained within the interlocking crushing blades for approximately one to two minutes. This crushing of the tissue has two results. One is it creates trauma to the tissues which cause them to swell once the crush is released. When a tube, such as a blood vessel swells, the internal diameter is reduced, so blood flow will be less. The second effect is for the blood to be held in position long enough to begin the clotting process, which carries on once the clamp is removed.



COURTESY OF BEN MASON-ROSSDALES

A horse fully prepared and draped for castration in the operating theatre. This is sterile surgery, with minimal risk of infection, so the wounds can be sutured, leaving very little evidence of the surgery, and allowing a rapid return to training

An alternative method of castration is to anesthetise the horse and carry out the procedure with the horse on its back, as a completely sterile operation in an operating theatre. This has the advantage of minimal post-castration swelling as there is no infection in the area, which can be a common problem with standing open castrations.

The downside is that all anaesthesia carries a risk of death in the horse. This has been calculated as approximately 1% in equine practice, and can be as low as 0.5% in the major well-equipped equine hospitals. This still means that 1 in 200 routine castrations would be expected to end in the death of the horse for one reason or another. In a large survey published in the *Equine Veterinary Journal* the costs and complications of castration both ways were compared. The mortality from 100 cases of standing castration was zero but from a 100 such procedures done under anaesthetic one horse died, backing up these statistics.

Potential complications

As with all intrusive surgical procedures in the horse there is potential for things to go wrong. With castrations done under general anaesthetic there are all the attendant risks of putting a 500kg animal on its back and up again. In addition to this, occasional cases show prolonged bleeding after the surgery, which results in significant swelling that sometimes has to be resolved by opening the scrotal sac. This negates any advantage of castration in an operating theatre under anaesthesia, as the horse then requires the same aftercare and time off as if done standing in the first place.

For standing castrations, problems include prolonged bleeding, which can occur irrespective of the length of time the cord has been clamped for. This can become serious enough to require a further surgery to identify the bleeding vessels and tie them off, but this is rare. Another rare complication is herniation of intestines through the potential space left in the inguinal canal with removal of the testicle. The intestines can either get trapped under the skin producing severe colic, or worse still dangle out of the abdomen and become contaminated and contused. This presents a very serious risk to the

COURTESY OF MATT SMITH-NEH

A horse undergoing standing laparoscopic surgery at the Newmarket Equine Hospital. The horse is standing in stocks, under the green plastic sterile drapes, to the right, and the surgeons are working on the internal organs by using a small camera and video display. 'Rig' castrations are now often done in this way

horse's survival and requires immediate surgery to attempt to clean the exposed bowel and return it to the abdomen. Fortunately this is extremely rare in the thoroughbred.

The most common complication is infection at the site of the castration. This procedure leaves an open wound and obviously the horse can lie down in bedding full of urine and faeces on the same day it has been castrated, therefore potentially contaminating the open surgical site. Almost all open castrations will become infected to a degree, and this produces a mild amount of swelling and inflammation in the site. Because the wounds are left wide-open these infections can normally drain and resolve themselves, but occasionally the scrotal wounds will heal prematurely, trapping in infection and creating a large 'bag' of infected fluid that has to be released, sometimes on more than one occasion, before the infection will fully resolve. This can add expense to the procedure.

'Rigs'

We take it for granted that in a normal male mammal the testicles will be contained in a sac between the hind legs called the scrotum, but that is not where they start out in life. Because all vertebrate mammals descended in the first place from fish, via the amphibians and reptiles, the reproductive tissue begins life in the mammalian embryo next to the kidney which lies just under and either side of the backbone. Fish still have their reproductive organs in this site.

During the long evolutionary history of the mammal, at some stage it became a biological advantage for the testicle to be situated outside the body cavity, presumably because of increased fertility when the testicles are held at a lower temperature than the core temperature of a mammal. Not all mammals have a scrotum – the elephant being a prime example of one in which the testicles are intra-abdominal. Most however do, and the testicle begins its descent from adjacent to the spine to its position in the scrotum by migrating along a tissue 'cord', leaving the abdomen via a potential 'hole' called the inguinal canal, where the layers of muscle tissue which overlap as the body wall leave a potential site of transit. The inguinal canal is also commonly the site of hernia formation, both in man and in the horse, where some of the abdominal contents that are not supposed to pass through it do so.

A rig is a male horse in which one or both testicles have failed to make this journey from adjacent to the kidney into the scrotum successfully. The testicle can be held up at any site along its route of transit. In some horses it is found still adjacent to the kidney having never set off. In others it will often be just inside of the inguinal canal, having successfully made the descent that far, but then for some reason failed to get through the canal and into the scrotum.

Rigs present three main potential problems: firstly, they can give the external appearance of being geldings, with no apparent testicles, but retain the behaviour of fully developed colts or stallions, so can be dangerous. Secondly, some trainers believe that having one testicle retained within the abdomen inhibits the performance of a male horse at full stretch because of the feeling of 'dragging' as the cord in the inguinal canal tightens. Whilst it is difficult to prove this, many trainers prefer to have the retained testicle removed, even if they leave the normal testicle in-situ. This has to be declared on the horse's passport, even if one testicle is left in the scrotum.

The highly successful stallion Selkirk is perhaps the best-known example of this. He didn't show much in his early career, but blossomed after removal of the abdominal testicle. He was equally successful at stud, both in terms of fertility and progeny, proving beyond doubt that having only one testicle does not necessarily impact on a breeding career at stud.

Finally, because most colts end up being gelded at some stage in their career, for horses with a retained testicle, this transforms the normally straightforward standing procedure into a much more complicated affair. This either involves laparoscopy (*see left*) or general anaesthesia and an abdominal operation, where the missing testicle has to be manually searched for within the abdomen, and then removed.

What terms are acceptable in the description of male horses at sales?

Under the Conditions of Sale at Tattersalls the definitions of different classes of male horses is as follows:

"A stallion is a male horse at stud. A gelding is a male horse which has been castrated (i.e. had both testicles removed in their entirety). A colt is a male horse up to and including the age of four years provided that he is not properly describable as a Stallion or Gelding. A Horse is a male horse five years of age or over not properly describable as a Stallion or Gelding. The description Stallion or Colt or Horse does not exclude a rig or crypt-orchid (the term rig or crypt-orchid applies to male horses in which one or both testes do not descend into the scrotum from the abdomen at the usual time)."

Under these conditions of sale, therefore, a rig can still be described as a colt or horse in the catalogue, and it is up to the purchaser to ascertain prior to the sale whether the horse has both testicles present or not, as there is no return clause for this condition.

Laparoscopic rig castration

In recent years, horses that have one or more retained testicles have been increasingly subjected to laparoscopic surgery, rather than a general anaesthetic, and exploration of the abdomen through a large incision. In laparoscopy the horse remains standing and sedated and the skin of the flank is desensitised by injection of local anaesthetic. A small incision is made and a telescope inserted into the abdomen to locate the retained testicle, which can be removed using specialist laparoscopic equipment inserted through a second entry portal. The advantage of laparoscopic surgery is that the horse does suffer the innate risk of general anaesthesia. The disadvantage is that the horse has to be starved for a couple of days prior to examination so that the abdomen is empty enough to see the organs within it. Downtime however is minimal and once the stitches have been removed from the skin incisions, normal training can recommence.