

Percutaneous Ligation of Spermatic Cord as an Alternative to Opened Castration in Donkeys

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Abstract

The objective of this study was to describe an alternative technique for opened castration in donkeys with minimal trauma and without any surgical incisions of the scrotum, through ligation of spermatic cord in situ. An experimental study was conducted on, fifteen mature donkeys (1-3 years old) at faculty of veterinary medicine at Moshtohour, Benha University. The animals were divided into three groups (5 donkeys for each). Percutaneous ligation of the spermatic cord using a sterile injectable needle 16 gauge in diameter and 6-10 cm in length was performed unilaterally in group 1 and bilaterally in group 2. The last group (3) was castrated by open traditional technique. Clinical observations were recorded. Scrotal and preputial dimensions were measured before and after ligation. The serum testosterone concentrations were evaluated pre and post-operation. The testes were collected from groups (1&2) 3 months post-ligation by opened castration for gross pathological and histopathological examination. Scrotal and preputial swellings were the only observed short-term complications. Results were revealed a significant reduction in the circumference and length of the scrotum and testicular atrophy post-ligation of spermatic cord. Significant reduction in basal serum testosterone levels 3 months after ligation than pre-ligation levels were observed. Hyalinization of the seminiferous tubules and loss of testicular interstitial tissue were indicative for complete ischemic necrosis. It was concluded that, the technique was simple, quick and non-invasive performed without skin incision and with minimal complications and without need for post-operative care.

Introduction

Castration is one of the most frequent performed surgical procedures in equine practice (3) and (14). Horses are usually castrated to eliminate stallion-like behaviour rendering the horse more docile and manageable. Some other indications for castration include tumours, orchitis, scrotal hernia and testicular trauma (6), (7) and (12). Commonly, equines are castrated between one and two years of age (2) and (32). Castration of the

male animal is accomplished by removal of the testes or by rendering the testes non functional in situ (3) and (14). Several techniques have been described for equine castration: opened, closed and semi-closed (12). The open technique is most frequently used technique in equine practice (33) and (36). The closed and semi-closed techniques have the disadvantage of requiring general anaesthetic, a risk in itself, as well as aseptic theatre facilities, advanced expertise and added expense (7), (12) and (33). Traditionally, castration techniques allow for second intention healing of scrotal wounds; however some have advocated primary closure (4) and (22). Other castration techniques have been described such as scrotal ablation (20), followed by primary closure and laproscopic evolution and removal (10) and (30). Their reported advantages of primary closure include early return to work, minimal postoperative management and a more favorable and early cosmetic outcome with no possibility of eventration (17) and (22). Although castration is a relatively simple procedure in hands of an experienced equine practitioner, complications are not uncommon. Some of these complications such as haemorrhage and eventration may be life threatening. Post-operative swelling and edema of the prepuce and scrotal area are the most common complication of routine equine castration; infection is the most common second complication of castration (12), (18), (19), (21), (24) and (28). Cases of post castration haemorrhage are primarily a result of failure to achieve haemostasis. Haemorrhage may be immediate or delayed up to several days (15) and (24). The most common source of haemorrhage is the testicular artery, less commonly the haemorrhage is from a scrotal vessel (branches of the external pudendal vessels or a vessel within the cremaster muscle (19) and (29). Peritonitis and hydrocel is also encountered as a complication of bloody castration in equines (21). For these reasons some have encouraged primary closure castration techniques. Some owners do not want to care for the incision sites or wait for the open incision to heal. Donkeys and mules have a greater tendency to bleed after castration. It's believed that the larger testicles result in larger blood vessels supplying the testicles and thus the greater amount of tissue to remove during castration and subsequent greater chance of blood lose. Many donkeys have a thicker scrotum and consequently larger blood vessels in the scrotal tissue so; the risk of scrotal bleeding is increased (9). The testes are

supplied by the testicular artery which passes along the lateral abdominal wall in the proximal mesorchium, to the internal inguinal ring where it becomes part of the spermatic cord. It joins the testes at its head (39). Transection, ligation, torsion, crushing of spermatic cord, section – ligation- release (SLR), or laparoscopic intra-abdominal ligation of the testicular artery so that blood flow to the testes is obstructed causing ischemic necrosis of in situ testicular tissue (1),(23),(25),(35),(37) and (40). Accordingly spermatic cord ligation would cause complete ischemic necrosis and atrophy of the testes, rendering it non functional *in situ*. The technique in the present study involved no surgical incision or spermatic cord transection or SLR or crushing (very minimal surgical trauma); it should minimize the risk of complications, like haemorrhage, infection, omental or intestinal eventration. (16) and (26). The purpose of the present study was to describe spermatic cord ligation *in situ* as an alternative method for castration in donkeys using minimal invasive technique.

Materials and Methods

This study was conducted on fifteen mature donkeys (1-3 years old) at the Faculty of Veterinary Medicine, Benha University. These animals were thoroughly examined clinically to confirm descended normal testes. The animals were divided into three groups (5 for each). The technique applied in this study was performed by **Ponvijay (25)** in bulls. Percutaneous ligation of the spermatic cord was applied unilaterally to the right spermatic cord in the first group and bilaterally in the second group. The third group was castrated by open method.

The operated animals were tranquilized by acepromazine maleate (Combistress) ® 0.05 mg/kg intravenous in the jugular vein. The animals were restrained in lateral recumbency. The skin of the scrotum was aseptically prepared, 2% xylocaine Hcl (5 ml) was infiltrated subcutaneously and distributed around and inside the spermatic cord at the level of the scrotal neck and the site of infiltration was gently massaged for release and distribution of the local analgesic injected (27) and (34). At the level of the neck of the scrotum, the spermatic cord was grasped and located