

# Manually assisted ejaculation in a stallion with erectile dysfunction subsequent to paraphimosis

Charles C. Love, DVM; Sue M. McDonnell, PhD; Robert M. Kenney, DVM, PhD

**P**enile dysfunction is a common sequelae of priapism, penile paralysis, and paraphimosis in association with debilitation,<sup>1,2</sup> anesthesia,<sup>3-9</sup> and trauma.<sup>10,11</sup> Two distinct aspects of penile dysfunction are inability to retract the penis and inability to achieve erection. Loss of erectile function can range from moderate to severe.<sup>12</sup> In a stallion with reset-pine-related penile paralysis and paraphimosis,<sup>6</sup> the penis reached approximately normal length and diameter with partial erection. Semen was collected from this stallion by use of a Missouri model artificial vagina. Similarly, a stallion that had penile paralysis in association with debilitation<sup>2</sup> responded with pelvic thrusting and ejaculation when the extended, flaccid penis was placed in an artificial vagina. In both of these cases, the penis appeared normal with respect to size and sensitivity. In some cases, it has appeared that changes in sensitivity of the shaft and glans of the penis have limited the stallion's response to an artificial vagina.<sup>13</sup> In the past, the prognosis for successful breeding of stallions with this condition has been poor. The stallion of this report was successfully returned to stud, despite severe loss of both erectile function and sensitivity of the glans and shaft of the penis.

An 8-year-old Thoroughbred stallion with an 8-month history of erectile dysfunction and paraphimosis was referred for reproductive evaluation with the goal of determining potential for returning to breeding by natural service. Prior to the onset of the condition, the stallion was used for breeding 2 years, siring 32 foals the first year. The number of foals born in the second year was unknown, but the pregnancy rate was reported to be satisfactory. The stallion had been observed to have an erection before being loaded on a van for transport to a veterinary hospital for minor orthopedic surgery under general anesthesia. Following the stallion's recovery from general anesthesia, the penis was prolapsed and rigid. During the acute stage, the stallion had been given warm and cold hydrotherapy to the penis. At 10, 13, and 14 days after on-

set, the corpus cavernosum penis had been flushed to remove blood clots. Additional treatments included systemic administration of penicillin, gentamicin sulfate, furosemide, vitamin B, dexamethasone, and trichlormethiazide. Afterward, the stallion had not been observed to achieve an erection or to fully retract the penis.

On initial examination at 8 months after onset of the problem, the penis persistently protruded 7 to 10 inches from the prepuce. It was of normal shape, flaccid, and free of lesions and scars. Palpation of the shaft of the penis revealed 2 bilateral fibrous cord-like structures corresponding to the corpora cavernosa. The skin of the shaft and glans penis were free of thickening and keratotic changes typically associated with chronic pendulous exposure of the penis. Ultrasonography of the base, shaft, and glans penis revealed that the area corresponding to the corpora cavernosa extending from the glans to the level of the scrotum to be densely echogenic. Further proximal, the cavernous tissue appeared to have a normal echogenic pattern. When the stallion was sexually aroused, the penis increased slightly in diameter, but the exposed portion remained flaccid.

The stallion was unusually excitable at rest as well as when exposed to a mare. The stallion also exhibited stall-walking, a repetitive back and forth pacing routine in his stall, primarily in association with activity in the barn. When exposed to a mare, the stallion became highly aroused, would rear, strike, and charge toward the mare. An effort was made to control the stallion in a manner that would not inhibit the high level of arousal, yet would permit safe handling in the breeding situation.

Evaluation of the stallion's ability to ejaculate revealed that in response to manual stimulation of the glans and shaft or to an artificial vagina, he did not respond with normal thrusting, despite various levels of temperature and pressure. The penis was small and flaccid, making it difficult to insert into the artificial vagina. The most vigorous coupling and thrusting responses were elicited by manual stimulation with warm towel compresses<sup>14,15</sup> after mounting. This was accomplished with the operator's left hand grasping the distal portion of the

From the Section of Reproductive Studies, School of Veterinary Medicine, New Bolton Center, 382 W Street Rd, University of Pennsylvania, Kennett Square, PA 19348.

shaft near the glans and the right hand applying steady, firm circumferential pressure with the compress to the base of the penis in the region of echogenically normal cavernous tissue. Thrusting was most vigorous in response to hot (45 C) compresses. The stallion responded more vigorously to a live mount mare than to a dummy. In 4 training sessions (15 to 30 minutes) over a 10-day period, the stallion showed consistent, vigorous coupling and thrusting, but failed to ejaculate. The stallion was tolerant of manipulation, maintained excellent libido, and displayed otherwise normal sexual behavior.

In an attempt to lower the ejaculatory threshold, gonadotropin-releasing hormone<sup>a</sup> (GnRH; 50 µg, SC) was administered at 2 hours and again at 1 hour before breeding. Following the first treatment, the stallion ejaculated on the first mount, using the breeding routine described. The level of sexual arousal appeared higher than without treatment, and the penis, although remaining flaccid, appeared to elongate somewhat during teasing. The stallion was given GnRH treatment before each of 3 more collection attempts at 1- to 2-day intervals. The stallion ejaculated on 2 occasions, in 3 and 2 mounts, respectively, and within <5 minutes on each occasion. Ejaculation occurred with the normal sequence of semen and gel fractions. The sperm morphologic characteristics were approximately 70% normal, with progressive motility also 70%.

Over the next 2 weeks, the manual stimulation procedure was repeated 8 times, without GnRH treatment. The stallion was teased with a mare next to his stall for at least 10 minutes before being taken to the breeding shed. This resulted in a level of sexual arousal similar to that following treatment with GnRH. On each occasion, the stallion ejaculated after 1 to 10 mounts in less than 15 minutes. Sexual behavior, including the number of mounts and thrusts, as well as latency to ejaculation were within the range of normal.<sup>16</sup> The ejaculates were collected by use of a funnel attached to a bottle<sup>17</sup> and evaluated according to Kenney et al.<sup>18</sup> All semen measures were within normal ranges.

A method for breeding was developed that would satisfy breed association requirements for natural service. The stallion was trained to couple more closely to the mare so that the penis could be manually inserted into the vagina as ejaculation became imminent. This was done by applying increased stimulation to the base of the penis only when the stallion coupled closely to the mare. When the stallion stepped back from the mare, pressure was withdrawn. Using this method, the stallion ejaculated within the mare's vestibule, and there was considerable reflux of semen. To direct the ejaculate through the cervix and retain spilled semen, a plastic examination mitt was used as a

vaginal liner, extending from the vulva to the internal os of the cervix. The spilled semen was then aspirated for infusion into the uterus as reinforcement breeding, according to breed association rules.

The referring veterinarian was instructed in the technique of manual stimulation, and the stallion was returned to stud. With the vaginal liner and use of the manual stimulation breeding aids, the stallion was bred to 20 mares, 18 of which were subsequently confirmed pregnant.

There are several reports of stallions with erectile dysfunction being bred by artificial insemination.<sup>1,6,12</sup> To our knowledge, the return to natural service of a stallion with severe erectile dysfunction has not been reported. Even when a stallion does not respond to an artificial vagina, it may be possible to elicit ejaculation with manual stimulation of the base of the penis. This is consistent with observations that glans stimulation is not a prerequisite for ejaculation.<sup>19</sup> In our laboratory, it has been found (SMM) that stallions trained to respond to manual stimulation for collection of semen<sup>15</sup> will thrust and ejaculate with the penis flaccid. In the stallion of this report, ejaculatory function seemed to be enhanced by tight constriction of the base of the penis. Increased pressure on the corpora cavernosa proximal to the point of manual constriction may have approximated that which occurs with normal erection, and thus have facilitated the ejaculatory reflex.<sup>20</sup>

An important aspect of this case was the stallion's strong libido. He achieved and maintained a high level of excitement during initial breeding attempts and subsequent manipulations. Initially, his excitable nature made him a challenge to handle, but this excitable nature appeared to play a positive role in that he persistently remounted and tolerated necessary manipulations. In another report,<sup>12</sup> the importance of patience when retraining stallions with incomplete erection was stressed. This case also highlights the progress that can be made with a systematic, patient approach. The first ejaculation was reached 10 days after admission, and with <2 hours of actual training time in the breeding shed. Daily ejaculation was established within the next 10 days and with <1 hour training time.

Experimental evidence indicates that GnRH, by increasing blood testosterone concentrations, and by directly influencing the CNS, may enhance sexual arousal and ejaculatory function in stallions.<sup>21,22</sup> In the stallion of this report, treatment with GnRH appeared to increase the level of arousal and may have reduced the ejaculatory threshold leading to the first ejaculations.

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<sup>a</sup>Cystorelin, CEVA, Overland Park, Kan.

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