Case File: Surgical Correction of Urogenital Congenital Abnormalities

Signalment and History
- "Dani," a 3-week-old miniature donkey foal of an "unknown sex" (see Fig. 1), was presented for constipation and suspected pseudohermaphroditism.
- Dani’s owner reported that the donkey had been having difficulties in passing feces since birth. The rDVM performed multiple enemas that would temporarily resolve the constipation, only to have it return. In addition, abnormal urogenital structures were present. Dani was referred to CSU-VTH for further evaluation and possible surgical options for correction.

Physical Examination
- Temperature, pulse and respiratory rate were all within normal limits.
- The foal was bright and alert, and nursing well.
- Weight: 15 kg
- Two descended testicles were palpated.
- Rudimentary teats were present in the inguinal region.
- There appeared to be an elongated vulvar-like structure present in the perineum (see Fig. 2).
- The penis could not be retracted into a prepuceal sheath as one did not exist, and the penis tip was noted to be retroflexed (caudally deviated—see Fig. 2).
- A normal external anal sphincter was not present as tissue from the dorsal and lateral aspects covered where a normal orifice should have been located.
Diagnostic Tests

The foal was sedated for a more complete evaluation of the perineum. A urinary catheter was placed into the bladder with ease from the vulvar-like structure. No urethral opening was present in the penis, and perineal hypospadias was diagnosed. In addition, there appeared to be a “hood” of tissue over the anal orifice resulting in constipation as fecal matter was impacted in the distal rectum. A partial rectal opening was noted on the ventral surface via digital exploration. An enema was performed and feces were passed from the rectum through the ventral opening into the urethra. Since the caudoventral rectal shelf communicated with the urethra forming a type of cloaca, a rectourethral fistula was diagnosed (see Fig. 3).

No other congenital abnormalities were found on examination. CBC and serum chemistry were within normal limits. Blood was submitted for karyotyping. Final results were not able to be obtained from the lab, but preliminary assessment through gene screening test revealed sex was consistent with a male genotype.

A diagnosis of perineal hypospadias was made due to the incomplete closure of urethra over the perineum and absence of a urethral opening within the penis. Atresia ani with a rectourethral fistula was also diagnosed.

Treatment

- Surgical perineal reconstruction and castration
  - Create unobstructed anal orifice (remove tissue flap)
  - Reconstruct a “shelf” between the rectum and urethra (remove the “cloaca”)
    - Similar to a single repair for a third degree perineal laceration (see Fig. 4)
  - Partial closure of the proximal urethra (hypospadias) (see Fig. 4)
  - Penile amputation (see Fig. 5)
  - Closed castration (excised testicles were grossly consistent with testicular tissue)
- Staged procedure was recommended, but the owner wanted to attempt all procedures under one general anesthetic period (see Fig. 6)
- Perioperative medications included: Potassium penicillin (22,000 IU/kg IV q6h), amikacin (20 mg/kg IV q24h), flunixin meglumine (1.1 mg/kg IV q12h)
Postoperatively: 7 days
- Minor dehiscence to the proximal portion of hypospadias resection.
- Firm swelling/mass over the left castration site.
- Ultrasound examination revealed thickened tissue, but no discernible abscess worth draining. The foal was afebrile but antibiotics were continued.

Postoperatively: 9 days
- The foal’s condition was noted as no-improvement to slight-worsening two days later, and surgical debridement and “mass” removal were recommended.
- The swelling was dissected under a second general anesthetic procedure. The mass was determined to be infected spermatic cord remnants. The swelling (and infection) stopped at the ligation performed around the spermatic cord at the first surgery. The infected portions were removed and the incision closed primarily.
- Culture and sensitivity of the infected remnants revealed *E. Coli*.
- Trimethoprim sulfa solution 20 mg/kg PO (48 mg/mL) was prescribed for 14 days following hospital discharge.

Fig. 4: Repair of a 3rd degree perineal laceration. From Techniques in Large Animal Surgery (Turner and Mcllwraith)
Outcome
Dani had no further complications from the castration and penile resection sites. Partial dehiscence at the construction site of the rectourethral shelf did occur; however, this has not affected him as he is able to urinate and defecate normally and has demonstrated no complications since surgery last year (see Fig 7). A second staged repair of this area was suggested but the owner, now in North Carolina, is pleased with the outcome and has elected for the donkey to not undergo another procedure at this time.

Overall Comments
Initial diagnosis of Dani’s congenital abnormalities was a male pseudohermaphrodite, which by definition would mean that he demonstrated gonads of one sex (male in this case) and external genitalia of the other sex. Classified on the bases of their gonads, male pseudohermaphrodites are most common having hypoplastic testes (often in the abdomen or inguinal canal) and an enlarged vulva with a penis like structure in the clitoridal fossa. This case did not quite fit into this category and was more similar to the infrequent reports of hypospadias. Hypospadias occurs when the urethral meatus is not located at the tip of the penis. Depending on the anatomical location, the classification of hypospadias could be glandular, penile, scrotal or perineal. This is only the second known reported case of hypospadias in the equid (the first case is from 1929). Penile hypospadias has been reported in two cases in horses in the past six years but demonstrates a different appearance than this case (see Fig 8).

In addition to the hypospadias, Dani also demonstrated two other congenital abnormalities, atresia ani and rectourtheral fistula. The rectourtheral fistula actually allowed the foal to pass feces, although with difficulty. Reconstruction of a normal anal orifice was essential to life in Dani’s case. The castration and
penile resection procedures could have been performed at a later time; however, the owner requested that all procedures be done at one time to minimize stress later in life. Construction of a rectourethral shelf was considered to be important in limiting contamination of the urethra/bladder with feces. The approach taken was that of repair for a third degree perineal laceration in mares. This approach to perineal reconstruction has not been described for this condition and overall was successful.

The infection of the spermatic cord remnants was not unexpected due the number of surgical procedures attempted under the same general anesthetic period and the fact that despite best efforts, Dani was able to chew at the castration and penile amputation sites. However, the complication resolved with surgical resection of the infected cord. The failure of the most caudal aspect of the rectourethral shelf was also not a surprise due to the attempt of performing the perineal reconstruction in one stage. In mares with rectovaginal tears, this is typically performed in two stages because the caudal aspect of the repair has too much tension and commonly fails. At the time of surgery, we did not know if this complication would occur in this miniature foal.

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Equine News & Events

Open Forum Dinner for Equine Veterinarians Sponsored by Merial
Join us Tuesday, September 10, 6:30 to 8:30 p.m. at the CSU VTH Room 118 for dinner and networking. RSVP by Tuesday, September 3, to katie.briggs@colostate.edu or 970-297-4266.

Arthroscopy - Learn from the Experts
Visit Fort Collins, Colo., in August for these updated Continuing Education courses that include a renewed practical format and laboratories. Attendees will receive hands-on instruction from top-level instructors, and gain practical information on how to perform arthroscopy.

  Basic Arthroscopy, August 22
  Advanced Arthroscopy, August 23–24
  Combined Basic and Advanced Arthroscopy, August 22–24
  Standing Arthroscopy of the Equine Stifle Joint, August 25