

Surgical Correction of Hematoma of the Penis in Bulls

Robert S. Hudson, D.V.M., M.S.

*Department of Large Animal Surgery and Medicine
School of Veterinary Medicine
Auburn University
Auburn, Alabama 36830*

Introduction

Rupture of the tunica albuginea of the penis of bulls occurs at a very predictable location, i.e., on the dorsal aspect of the distal bend of the sigmoid flexure (7). The rupture probably occurs as a result of extreme bending of the erect penis during an inept copulatory thrust. The location of the rupture has been described as the point at which a fulcrum (the preputial orifice) is applied to the erect penis (5). However, experimental rupture of 25 cadaver penises with hydraulic pressure at the predicted site with or without bending indicated an intrinsic weakness at the rupture site (3). The tunica albuginea has been described as focally thinner at this point (4). The angioarchitecture of the distal bend of the sigmoid flexure with its relatively large cavernous spaces (1) may also contribute to the predisposition. The force for the rupture comes from within the corpus cavernosum penis (CCP) and may be facilitated by the proposed bending. Whereas normal copulatory CCP pressure frequently reaches 200-400 lbs. per sq. in. (psi) (2), the pressure required for the rupture of cadaver penises was ca. 1486 psi (3). At rupture a jet of blood under this pressure serves as a highly traumatic force, which accounts for the severity of the lesions encountered on surgical exposure. The blood tears and displaces the surrounding elastic tissue layers and collects en masse along variable planes of the elastic tissue. The blood may invade the sheaths of the retractor penis muscles. The sensory nerves and vessels dorsal to the penis are vulnerable to injury. The resultant hematoma formation in the excavated surrounding tissue gives the clinical condition its popular name.

The size of the hematoma is variable from case to case. There is no appreciable bleeding from the flaccid penis and the amount of blood required to fill the CCP is ca. 100 ml (3). It is probable that a variable number of repeated attempts at copulation following the rupture cause the variation in volume of extracorporeal blood. Some of the blood gravitates to the prepuce, causing it to prolapse and take on a purplish color. The surface of the prolapsus is usually glistening due to intracutaneous lymph collection. The blood may also cause blotches of discoloration of the skin on the ventral aspect of the sheath and abdomen.

Diagnosis

The hematoma appears as a firm, symmetrical circumscribed swelling that uniformly encases the penis just cranial to the scrotum. There may be a proximal extension of the swelling along the sheaths of the retractor penis muscles. The swelling usually tapers distally. This description should aid in differentiation from retropreputial abscess which is more distally located and does not surround the penis. Collection of urine following rupture of the urethra presents a large, diffuse swelling all along the sheath. The suspected hematoma should not be aspirated via needle puncture because of danger of inoculating the mass of blood. If the animal is seen within five to seven days of the injury, the discolored preputial prolapse and purplish blotches of skin on light-skinned bulls will further support the diagnosis.

Treatment

Management of cases of hematoma of the penis requires consideration of the value of the bull and the desires of the client in relation to general prognosis, surgical facilities available and the length of time expired since the injury. Bulls of marginal value may be restored by allowing sufficient time (60-90 days) for spontaneous recovery augmented by a ten-day course of broad spectrum antibiotics to reduce chance of abscessation of the clot. The clot will be resorbed without other treatment or manipulation. Surgical correction provides an accurate closure of the rent in the tunica albuginea, reduces the chance of cavernosal-venous shunt formation, and probably reduces convalescent time. Surgery should be attempted only if aseptic technique can be accomplished, due to the susceptible nature of the area if seeded with pyogenic organisms. It is preferable to perform surgery in five to seven days after injury. If surgery is delayed as much as two weeks, the procedure is quite difficult due to organization of the hematoma and difficulty in exposing the penis. The conservative approach is preferable in delays of this length. If the conservative approach is elected, sexual rest is indicated for 60 days but the penis may be manually extended after thirty days to determine progress.

Prognosis is difficult to assess at the time of initial examination. In order to return to satisfactory ser-

vice, the bull must present an intact penis, capable of full extension and erection and with an intact sensory nerve supply. Experience indicates that most bulls return to service.

Surgical Procedure

Inhalation general anesthesia is preferred to aid maintenance of aseptic technique. A 48-hour fast aids significantly in avoiding regurgitation.

The patient is placed in right lateral recumbency to avoid undue pressure on the rumen. The left rear leg is flexed and raised to expose the inguinal area. Thorough surgical preparation of the operative field is mandatory.

The left lateral aspect of the swelling is draped for an oblique cranioventral incision extending from just cranial to the rudimentary teats almost to the ventral midline. As the skin and connective tissue layers superficial to the clot are incised, careful hemostasis will prevent subsequent bleeding into the cavity of the clot. The incised skin edges are covered by towels clamped in place. Since the objective is repair of the tunica albuginea, clot removal is incidental to exposure of the penis. Meticulous removal of the clot in the many small irregular pockets of damaged tissue is unnecessary and will induce troublesome hemorrhage. As the initial portion of the clot is removed the violent nature of the trauma will be observed. This is to be expected and merely indicates rupture of the tunica albuginea has occurred rather than rupture of superficial vessels under systemic blood pressure as has been reported elsewhere (5). The author has not experienced seeing the latter condition.

A loop of the penis, with as much surrounding elastic tissue as possible, is pulled through the skin incision. The confluence of the retractor penis muscles with the penis is located. Occasionally the sheaths of the muscles are filled with clot which should be carefully removed. The rupture should be on the dorsum directly across from the attachment of the retractor muscles. The larger mass of clot may be located external to several layers of elastic tissue in which case a relatively small hole in the elastic tissue may be the only communication between hematoma and the tear in the tunica albuginea. Care should be taken to avoid identifying the elastic tissue erroneously as the tunica albuginea which is dull white and firm collagenous tissue. The tunica albuginea is exposed by careful longitudinal dissection of the elastic tissue directly on the dorsal midline to avoid trauma, even transection, of the sensory nerves that lie in elastic tissue superficial to the penis. These nerves are often obscured by damaged tissue and clot. Superficial vessels are also to be avoided.

The rent in the tunica albuginea is usually transverse in direction although it occasionally will be oblique. The frayed fibers are trimmed and debrided and the torn edges are apposed with No. 1 synthetic absorbable suture in a simple continuous

pattern. The immediately overlying elastic tissue, damaged or not, is sutured with 000 chromic gut to provide a smooth channel for the penis. The penis is then returned to its natural position. Sterile physiological saline at 40°C is poured into the cavity to wash out bits of clot. The saline is removed. It is helpful at this time to have an assistant outside the sterile field to extend the penis.

The damaged superficial connective tissue cannot be reconstructed and a cavity will remain. The subcutaneous tissue is sutured with 0 chromic gut and the skin is sutured with non-absorbable suture. A seroma will occupy the cavity but should be resorbed in about two weeks.

Aftercare includes prophylactic administration of broad spectrum antibiotics for ten days and skin suture removal in about 14 days. Manual extension of the penis may be attempted at 10-14 days but only firm gentle force should be applied. If the free portion of the penis can be exposed, sensation should be tested. Any demonstration of sensation is laudable; lack of sensation indicates a guarded prognosis. Return of sensation may be delayed or may never occur. The bull should have 45-60 days of sexual rest prior to re-entry into service. A fibrotic mass may be palpable dorsal to the penis for many months.

Complications

Whether the conservative approach or surgical correction is used, the possibility of abscessation and subsequent fibrosis with inability to extend the penis must be considered. Occasionally the flaccid penis may be extended to its apparent full length. However, the erect penis increases in length and circumference by 15% and requires less fibrotic restriction than the flaccid penis (3). In such cases, bulls have been observed to show pain at breeding. If this condition persists, surgical removal of the restricting fibrotic tissue is indicated.

Lack of sensation, whether by initial nerve injury as evidenced by observing divided nerves at surgery or by imprudent surgical trauma, will result in the bull's inability to make intromission or to ejaculate.

Sometimes there is failure of sufficient erection to allow for copulation. Previously this was thought to be due to occlusion of the corpus cavernosum with scar tissue. In recent years bulls with erection failure following convalescence with conservative treatment have, via contrast cavernosography (8), been determined to have developed cavernosal-venous shunts at the rupture site which preclude effective erection. This condition has not been observed following suture closure of the tunica albuginea. The shunts have been effectively repaired with a procedure similar to that for primary rupture of the tunica albuginea.

References

1. Ashdown, R. R.: The Angioarchitecture of the Sigmoid Flexure of the Bovine Corpus Cavernosum Penis and Its Significance in Erection. *J. Anat.*, 106, (1970): 403-404. - 2. Beckett, S. D., Walker, D. F., Hudson, R. S., Reynolds, T. M., and Vachon, R. I.: Corpus Cavernosum Penis Pressure and Penile Muscle Activity in

the Bull During Coitus. *Am. J. Vet. Res.*, 35, (1974): 761-764. - 3. Beckett, S. D., Reynolds, T. M., Walker, D. F., Hudson, R. S., and Purohit, R. C.: Experimentally Induced Rupture of Corpus Cavernosum Penis of the Bull. *Am. J. Vet. Res.*, 35, (1974): 765-767. - 4. Goldston, R. T.: The Bovine Penile Hematoma. In *Proceedings, Conference on Reproductive Problems in Animals*, Univ. of Georgia, Athens, Ga. (1969): 63. - 5. Hafez, E. S. E.: In *Reproduction in Farm Animals*. Lea and Febiger, Philadelphia, Pa. (1962). - 6. Noordsy, J. L., Trotter, D. M., Carnahan, D. L., and Vestweber,

J. G.: Etiology of Hematoma of the Penis in Beef Bulls - A Clinical Survey. *Proc., VI Int. Conf. on Cattle Diseases* (1970): 333-338. - 7. Walker, D. F.: In *Textbook of Large Animal Surgery*. Ed. by F. W. Oehme and J. E. Prier, Williams and Wilkins, Baltimore, Md., U.S.A. (1974): 486-487. - 8. Young, S. L., Hudson, R. S., Walker, D. F.: Impotence in Bulls Due to Cavernosal-Venous Shunts. I. Diagnosis by Cavernosography. *J.A.V.M.A.* (Submitted for publication).



President Allenstein and Bert Hawkins, who represented the American National Cattlemen's Association at the AABP convention.