

Permanent Urethrostomy for Treatment of Caprine Hypospadias

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Abstract: Hypospadias, a more extreme form of congenital urethral defect, is seen in young phenotypically male goats. In hypospadias, the urethra remains open on the ventral surface of the penis and is visible externally on the preputial midline. **Problem statement:** The purpose of this study was to evaluate the surgical treatment outcome in hypopadiac kids. **Approach:** Thirty six male goat kids with sings of hypospadias were referred to the Animal Hospital of Veterinary Medicine Faculty of Kerman, Iran. The age of patients ranged from one week to 3 months old. The kids were showed symptoms of dysuria and stranguria, during urination. Urine leaked into the subcutaneous tissue of ventral abdominal wall and prepuce. Surgical reconstruction is the only possible therapeutic option for hypospadias. In the current study, permanent urethrostomy operation was carried out for treatment of all kids. **Results:** Two weeks after surgery the goat kids were in good condition. After 2 months, no significant postoperative complications were observed. **Conclusion:** Permanent urethrostomy is a reliable technique to treatment of hypospadiac kids.

Key words: Hypospadias, goat, surgical treatment, urethrostomy

INTRODUCTION

Hypospadias is a rare congenital malformation of the urethra which has been reported in dogs, sheep, goats, cattle, rats, nonhuman primates and human (Alam *et al.*, 2005). Hypospadias is imperfect closure of the external male urethra (Radostits *et al.*, 2007). This congenital defect results from failure of fusion of the urogenital folds and incomplete formation of the penile urethra (Boothe, 2003). Hypospadias is accompanied by hypoplasia of the corpus cavernosum urethra (Fossum, 2002). Urine may pool within the prepuce and subcutaneous space, causing irritation and infection of penis and preputial lining (balanopostitis). The external urethral orifice can occur anywhere of the ventral aspect of the penis from the normal opening to the perineal regions, glandular, penile, scrotal and perineal hypospadias have been reported (Alam *et al.*, 2005; Boothe, 2003; Fossum, 2002).

The etiology of hypospadias is not well-understood, it seems to be multifactorial, may be related to genetic, endocrinological and environmental factors (Silver, 2000). Surgical correction should be considered for treatment of hypospadias (Boothe, 2003). This study, presents surgical management in 36 hypopadiac goat kids.

MATERIALS AND METHODS

Over a 14 month period, from April 2007-June 2008, 36 goat kids with sings of hypospadias Fig. 1, were referred to the Animal Hospital of Veterinary Medicine Faculty, Shahid Bahonar University of Kerman, Iran. The age of patients ranged from one week to three months old. The owners declared that the kids have shown symptoms of dysuria and stranguria, during urination. In physical examination, the most of kids were depressed and Temperature, Pulse and Respiratory Rate (TPR) of all patients were in normal range. All of the kids were male, not hermaphrodites or pseudo-hermaphrodites. The kids were restrained in dorsal recumbency; the preputial skin was retracted caudally and it was observed that the urethral process and glans was lightly adhered to the prepuce in some of cases. The preputial orifice was small and narrow. The most obvious clinical finding was urethral diverticulum in different size, which located in ventral part of penis, caudal to the preputial orifice. Manual pressure on the diverticulum caused dribbling of urine from the urethral orifice. In some cases congenital defect such as ectopic penis, located between anus and scrotum (one case) was seen. In one goat opening of urethra was located in the scrotal region and in the others were in penile position.

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Fig. 1: Hypospadias in goat kids, Urine leaked into the subcutaneous tissue of ventral abdominal wall, ectopic penis



Fig. 2: Permanent urethrostomy in hypospadiac goat

Ultrasonography examination was carried out in some cases and showed that the diverticulum and bladder were fluid-filled, without any abnormality in abdominal cavity.

Blood and urine samples were taken from 14 of 36 cases in different flocks and submitted to Laboratory of Teaching and Research Hospital of Veterinary Medicine Faculty of Kerman, Iran. Results revealed that hematologic (PCV, RBC, Hb, WBC and neutrophil/lymphocyte ratio) and biochemical parameters (BUN, creatinine and total and direct bilirubin) were in normal limits. Urinalysis showed that, in all of cases, specific gravity was in normal range (1.015-1.035) and all urine samples contained normal number of erythrocytes, leukocytes, crystals and a few epithelial cells (in some cases). Microscopic examination revealed that there were no bacteria in urine samples.

Surgical treatment was carried out on all of the referred cases (36 goat kids). The goats were sedated by IV administration of Xylazine hydrochloride (Rompun[®], Bayer), 0.05 mg kg⁻¹, then placed on dorsal recumbency and the caudal abdominal and perineal regions were prepared aseptically for urethrostomy operation. Prepuce and glans were desensitized with topical administration of 2% Lidocaine jelly (Pasture

Institute, Iran). The urethral process and glans penis were exposed with caudal retraction of the prepuce. The narrowed urethral process was amputated with scissors and then the urine was spontaneously voided. A lubricated sterile urine catheter was placed in the urethra.

For permanent urethrostomy, local anesthesia was used by circumferential injection of 1% Lidocaine hydrochloride solution (Pasture Institute, Iran) around the diverticulum. Then a small elliptical incision (1.5-2 cm) was carried out on the midline skin at urine pool region. The skin and subcutaneous tissue was excised and after control of bleeding, penile urethrostomy was performed by suturing the urethral mucosa to the skin with 3-0 nylon (Teb Keyhan, Iran) or 3-0 Polyglycolic Acid (PGA, Teb Keyhan, Iran) sutures in a simple interrupted pattern Fig. 2. Immediately after operation the kids urinated incontinently, without difficulty, after that the urethral catheter was removed.

Postoperative treatments included intramuscular injection of Penicillin-Streptomycin (20000 IU kg⁻¹ to 20 mg kg⁻¹) for 5 days, daily lavage of wound with normal saline and topical administration of Nitrofurazone ointment. After 2 weeks, there were no significant complications in surgical region and all kids were completely normal. Two months after operation, there is no complaining about postoperative complications from goat's owners.

RESULTS AND DISCUSSION

Hypospadias, a more extreme form of congenital urethral defect, is seen in young phenotypically male goats. In hypospadias, the urethra remains open on the ventral surface of the penis and is visible externally on the preputial midline (Smith and Sherman, 1994). In human, hypospadias is the second most common congenital abnormality after cryptorchidism (Pierik *et al.*, 2002). With an incidence of 1:300; hypospadias is one of the most common genital anomalies in human male new borns (Djakovic *et al.*, 2008; Leung and Robson, 2007), but occurs rarely in domestic animals (Bleul *et al.*, 2007).

Surgical reconstruction is the only possible therapeutic option for hypospadias (Leung and Robson, 2007). In human medicine, the goal of hypospadias surgery is to create a straight penis that is adequate for sexual intercourse, to reposition the urethral meatus and establish good cosmetic results that include a conically shaped glans. Base on anatomical position of urethral orifice and kind of abnormalities, many procedures have been designed for the repair of hypospadias and no single

procedure is suitable for all cases (Djakovic *et al.*, 2008; Leung and Robson, 2007).

Alam *et al.* (2005) reported surgical treatment of 3 hypospadiac calves. In his study, urethrostomy associated with castration was carried out for treatment of the patients. He suggested that the calves urinated normally postoperatively (Alam *et al.*, 2005).

The urethral process is commonly amputated therapeutically and sometimes prophylactically in small ruminant breeding male (Smith and Sherman, 1994).

Hypospadias is thought to be inherited in sheep and dogs but this has not been confirmed because there have not been sufficient cases to study (Dennis, 1974; Hayes and Wilson, 1986). Radostits *et al.* (2007) suggested that no genetic influence was suspected and the cause was unidentified in animals. In cattle hypospadias is attributable to a genetic defect in only 25% of affected animals (Bleul *et al.*, 2007). Similarly, only 31% of men with hypospadias have a genetic or chromosomal defect (Boehmer *et al.*, 2001). Because a heritable component for hypospadias cannot be ruled out, affected animals should be castrated (Bleul *et al.*, 2007). It is recommended that do not use animals with hypospadias for breeding (Fossum, 2002).

In our previous study, Sakhaee and Azari (2009) suggested that grazing in pistachio orchards may play an important role in this abnormality, because the most of the hypospadiac goats were fed by pistachio leaves and outer shells.

Early complications of hypospadias repair include bleeding, hematoma, wound infection, wound dehiscence and urinary tract infection (Stokowski, 2004; Synder *et al.*, 2005). Some late complications include urethrocutaneous fistula, urethral stricture, balanitis and urethrocele (Nuininga *et al.*, 2005; Soomro and Neal, 1998). Alam *et al.* (2005) stated that postoperative complications in hypospadias calves included partial wound dehiscence in one calf (of 3 calves), resulting in second intention healing of the incision (Alam *et al.*, 2005).

In our study, there was no major complication such as significant wound infection, complete dehiscence of sutures, obstruction in the artificial opening and dysuria after urethrostomy operation in operated kids. In 2 cases partial suture dehiscence were observed that has been allowed to repair in second intention wound healing.

In Canine scrotal or prescrotal urethrostomy techniques, Bjorling (2003) suggested that the urethra is sutured to the skin using monofilament nonabsorbable suture material, whereas Fossum (2002) recommended absorbable suture materials. Monofilament nonabsorbable suture material is used to appose the

edge of the urethral mucosa to adjacent skin adge for urethrostomy in goat (Tibary and Van Metre, 2004). Alam *et al.* (2005) was used nylon for suturing of urethra to skin in hypospadias calves. Suture removal is performed two weeks after surgery when the nonabsorbable suture material is used (Tibary and Van Metre, 2004).

In our study, Nylon sutures were removed 12-14 days after operation and Polyglycolic acid sutures were left in the surgical site. The kind of suture materials had no significant effects on occurrence of postoperative complications.

CONCLUSION

In present study, the aim of urethrostomy operation in goat kids was relief of dysuria, stranguria and other complications following hypospadias and also in order to economic purpose for animal owners. Since the operated animals were in high risk for involvement of ascending infections in urogenital tract, it was recommended to the owners, the animals sacrificed after fattening for feeding purpose.

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REFERENCES

- Alam, M.R., S.H. Shin, H.B. Lee, I.H. Choi and N.S. Kim, 2005. Hypospadias in three calves: A case report. *Vet. Med. Czech.*, 11: 506-509. <http://old.vri.cz/docs/vetmed/50-11-506.pdf>
- Bjorling, D.E., 2003. The Urethra. In: *Text Book of Small Animal Surgery*, Slatter, D. (Eds.), 3rd Edn., WB Saunders Company, Philadelphia, USA., ISBN: 0-7216-8607-9, pp: 1640-1643.
- Bleul, U., F. Theiss, M. Rutten and W. Kahn, 2007. Clinical, cytogenetic and hormonal findings in a stallion with hypospadias-A case report. *Vet. J.*, 173: 679-682. DOI: 10.1016/j.tvjl.2006.03.005
- Boehmer, A.L., R.J.M. Nijman, B.A.S. Lammers, S.J.F. de Coninck and J.O. Van Hemel *et al.*, 2001. Etiological studies of severe of familial hypospadias. *J. Urol.*, 165: 1246-1254. PMID: 11257695
- Boothe, H.W., 2003. Penis, Prepuce and Scrotum. In: *Text Book of Small Animal Surgery*, Slatter, D. (Eds.), 3rd Edn., WB Saunders Company, Philadelphia, USA., ISBN: 0-7216-8607-9, pp: 1535.

- Dennis, S.M., 1974. A survey of congenital defects of sheep. *Vet. Rec.*, 95: 488-490. PMID: 4155810
- Djakovic, N., J. Nyarangi-Dix, A. Ozturk and M. Hohenfellner, 2008. Hypospadias. *Adv. Urol.*, 2008: 1-7. DOI: 10.1155/2008/650135
- Fossum, T.W., 2002. Surgery of the Male Reproductive Tract. In: *Small Animal Surgery*, Fossum, T.W., C.S. Hedlund, D.A. Hulse, A.L. Johnson and H.B. Seim *et al.* (Eds.), 2nd Edn., Mosby, Inc., Elsevier Science Company, USA., ISBN: 0-3230-1238-8, pp: 662-663.
- Hayes, H.M. and G.P. Wilson, 1986. Hospital incidence of hypospadias in dogs in North America. *Vet. Rec.*, 118: 605-607. PMID: 3487876
- Leung, A.K.C. and W.L.M. Robson, 2007. Hypospadias: An update. *Asian J. Androl.*, 9: 16-22. DOI: 10.1111/j.1745-7262.2007.00243.x
- Nuininga, J.E., R.P.E. de Gier, R. Vetschuren and W.F. Feitz, 2005. Long-term outcome of different types of 1-stage hypospadias repairs. *J. Urol.*, 174: 1544-1548. PMID: 16148649
- Pierik, F.H., A. Burdorf, J.M.R. Nijman, R.E. Juttman and S.M.P.F. de Munick Keizer-Scharama *et al.*, 2002. A high hypospadias rate in the Netherlands. *Hum. Reprod.*, 17: 1112-1115. PMID: 11925415
- Radostits, O.M., C.C. Gay, K.W. Hinchcliff and P.D. Constable, 2007. *Veterinary Medicine*. 10th Edn., Saunders Co., London, ISBN: 0-7020-2777-4, pp: 573.
- Sakhaee, E. and O. Azari, 2009. Hypospadias in goats. *Iranian J. Vet. Res. Shiraz Univ.*, 10: 298-301. http://www.sid.ir/en/VEWSSID/J_pdf/102320092816.pdf
- Silver, R.I., 2000. What is the etiology of hypospadias, a review of recent research. *Delaware Med. J.*, 72: 343-347. PMID: 10984977
- Smith, M.C. and D.M. Sherman, 1994. *Goat Medicine*. 1st Edn., Lea and Febiger, Williams and Wilkins, USA., ISBN: 0-8121-1478-7, pp: 388-389, 393.
- Soomro, N.A. and D.E. Neal, 1998. Treatment of hypospadias: An update of current practice. *Hospital Med.*, 59: 553-559. PMID: 9798545
- Stokowski, L.A., 2004. Hypospadias in neonate. *Adv. Neonatal Care*, 4: 463-472. PMID: 15368213
- Synder, C.L., A. Evangelidis, G. Hasen, S.D. Peter and D.J. Ostlie *et al.*, 2005. Management of complications after hypospadias repair. *Urology*, 65: 782-785. PMID: 15833528
- Tibary, A. and D. Van Metre, 2004. Surgery of the Sheep and Goat Reproductive System and Urinary Tract. In: *Farm Animal Surgery*, Fubini, S.L. and N.G. Ducharme (Eds.). Saunders, Elsevier, USA., ISBN: 0-7216-9062-9, pp: 539-540.