



SHORT COMMUNICATION

New Surgical Technique for Treatment of Obstructive Penile Urethrolithiasis without Interference with Breeding Capability: Clinical Study on 25 Calves

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ABSTRACT

A clinical study performed on 25 calves suffered from urine retention with intact bladder as a result of lodgment of urinary stone at the penile sigmoid flexure. Paracentesis of the bladder were applied to the cases with over distended bladder. All animals were subjected to dorsal penile urethrotomy for removal of the stone and temporary retrograde catheterization of the bladder using suitable diameter Rayle's tube. The tube was removed 8-10 days post-surgery, and the calves were observed for six months post-surgery. Twenty one calves cured without surgical complications and kept their penile erection and breeding capability. Four calves showed post-surgical complications, two of them suffered from abscess formation at the sigmoid flexure, the third calf had adhesion at sigmoid flexure and the fourth had ruptured urethra. The technique is a rapid simple technique of many advantages over urethrostomy and it has the same cost. The technique can be considered an alternative technique for treatment of urine retention with intact bladder without affecting breeding capability.

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INTRODUCTION

Urethral obstruction in calves is a fatal disease that predisposes to high mortality rate unless the animal is subjected to emergency surgical treatment for correction of the obstruction. Multiple surgical techniques have been described for treatment of such affection including urethrotomy (Singh *et al.*, 2010), urethrostomy (Khan *et al.*, 2009; Azari *et al.*, 2010; Kalim *et al.*, 2011; Shridhar 2011), penile transaction with urethral fistulation (Misk and Semieka, 2003), tube cystotomy (Kushwaha *et al.*, 2007), and laparotomy and urethrotomy (Abdel-Fattah and Sedeek, 2005). In spite of all these surgical techniques, a frustrating situation arises when surgeon has to treat an affected calf, as the surgeon has to weight advantages against disadvantages of each technique and the benefits against the cost of treatment, and to determine the effect of the technique on breeding capability of the calf. Because there was no final statement describes the best method for treatment of obstructive urethrolithiasis with intact bladder with preservation of breeding capability of the calf, this study was designed to evaluate a technique of urethrotomy and bladder catheterization for treatment of urine retention, with intact bladder, in calves

and its effect on the future breeding capability of these calves.

MATERIALS AND METHODS

Twenty five calves suffered from urine retention were subjected to minimal invasive diagnostic procedures to reach definite diagnosis. The animals were prepared for aseptic surgery. Nine animals with over distended bladder were subjected to paracentesis of the bladder to avoid its rupture and the need for celiotomy. Three of them weighing over 200 kg were subjected to trans-rectal paracentesis of the bladder, and six calves of 70-100 kg body weight were subjected to trans-abdominal paracentesis of the bladder after being anaesthetized and restrained gently.

Anesthetic regimen consisted of (a) sedation by intramuscular 0.2 mg/Kg xylazine HCl and intravenous 0.2 mg/Kg diazepam, (b) epidural analgesia by 5-10 ml 2% lidocaine HCl, and (c) local infiltration analgesia by 2% lidocaine HCl.

Following anesthesia and aseptic preparation, the calves were restrained in right lateral recumbency with the left hind limb flexed and abducted. About 5 cm

paramedian skin incision was created lateral to the penis (Fig. 1), then blunt dissection was made to exteriorize the sigmoid flexure of penis containing the stone. The penis was ligated proximal and distal to seat of obstruction and the penis was incised at its dorsal aspect among dorsal penile veins and nerves for exteriorization of the stone (Abdel-Fattah and Sedeek, 2005). Following removal of the stone (Fig. 2), a flexible catheter was passed through penile urethra from urethrotomy seat towards the bladder to ensure presence of no more stones. The catheter was removed, seat of urethrotomy was sutured, the two ligations were removed, and the penis was lubricated with oily antibiotic and anti-inflammatory and placed in its normal position again. The tunica albugenia and fascia were sutured and so the skin incision.

The penis was exteriorized through the preputial orifice and a flexible Rayle's tube supported with flexible multifilament wire was passed through the external urethral orifice towards the bladder (Sedeek *et al.*, 2009). On reaching the bladder (Fig. 3), the wire was removed and the catheter was left in the bladder, the excess length of the catheter was cut and the tip of the catheter was sutured to the glans penis. Only 1 cm of the catheter was left cranial to the external urethral orifice. Follow up included intramuscular injection of oxytetracycline (20%) 1 cm/ 10 kg every three days till removal of the catheter. Massage and protrusion of the penis were performed daily for 8-10 days to avoid adhesion at the level of sigmoid flexure. Animal's water consumption was increased by adding sodium chloride to the ration. Silk stitches and catheter were removed 8-10 days post-surgery. Short-term complications were recorded and managed conservatively. Animals were monitored for six months and capability of erection and protrusion of the penis was tested. This procedure was performed by epidural analgesia for detection of absence of adhesion at sigmoid flexure. Natural mating was tested in some animals to determine capability of erection.

RESULTS AND DISCUSSION

Following surgery, two calves suffered from infection with abscess formation at the surgery site and around the sigmoid flexure, and they were subjected to urethrostomy and conservative treatment of the abscess. These two calves lost breeding capability permanently because of urine diversion, obliteration of the distal urethra and adhesion at the level of sigmoid flexure with inability to protrude penis (phimosis). Another calf showed signs of adhesion at the level of the sigmoid flexure and phimosis without evident signs of infection at seat of operation. Only one calf showed signs similar to ruptured urethra 3 days after removal of the catheter. The swelling extended from the scrotum to the umbilicus with clear signs of moist gangrene. The animal was subjected to urethrostomy under the request of the owner with scarification of the swelling and conservative treatment of the gangrene, but he succumbed five days post-surgery as a result of the gangrene and sloughing of large piece of skin at the abdomen. The rest of the calves retained their normal erection and breeding capability, and had no episodes of re-obstruction.

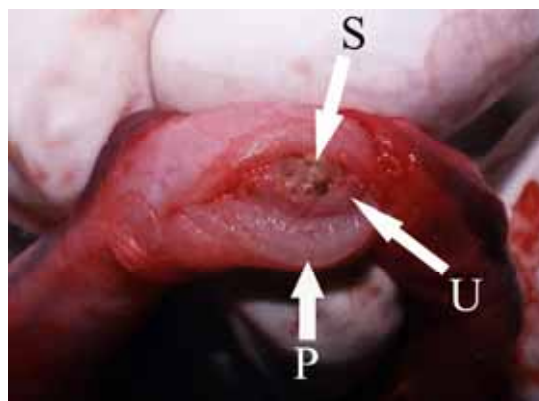


Fig. 1: Pre-scrotal skin incision of 5 cm length, for exteriorization of the sigmoid flexure.



Fig. 2: Dorsal urethrotomy for removal of stone. S: Stone, U: Dorsal wall of urethra, and P: Body of the penis.



Fig. 3: Retrograde catheterization by Rayle's tube No. 10. Notice the supporting wire in position, and the voided urine from the catheter.

Urethrolithiasis with intact bladder is a critical condition that requires immediate surgical intervention for correction of the condition to avoid rupture of the urethra or the bladder, or even death of the calf (Kalim *et al.*, 2011). Surgeons in such situation prefer rapid simple technique that required minimal hospital setting, associated with minimal complications, and when possible of low cost. However, the used technique in this study has all of these advantages and moreover, it can be used under field condition. In spite of the observed complications

with this technique, it can be considered a better technique than urethrostomy from different points of view. This in fact is due to many reasons, as urethrostomy permanently divert the urine and the semen so the calf losses breeding capability forever, and used for fattening (Misk and Semieka, 2003). The cost of the technique was as low as that of urethrostomy, and the complications of urethrostomy like urine scalding, dehiscence of wound, or stricture of the created fistula (Sedeek and Bakr, 2009) have not been recorded in this study, moreover it is associated with very low incidence of urethral rupture controversial to ventral urethrotomy technique (Abdel-Fattah and Sedeek, 2005). The observed rupture urethra is not in agreement with the recorded results of this technique (Abdel-Fattah and Sedeek, 2005), however, during urethrostomy we could not determine the seat of urethral rupture or urine leakage.

Stricture of the urethra months after removal of the urethrolith may ensue as a result of urethral trauma by the stone and it may require perineal urethrostomy for relieve of dysuria, and absence of this complication in this study can be explained in the light of incising the dorsal surface of the urethra through penile body, that is followed by suturing of the body of the penis without involvement of the urethra and this in turn predisposed to urethral dilatation rather than stricture at urethrotomy site (Abdel-Fattah and Sedeek, 2005).

Conclusion: It was concluded that dorsal urethrotomy and retrograde catheterization are alternative techniques that can be considered as surgical option for the treatment of

calves suffering from obstructive urethrolithiasis with intact bladder, under field condition. The technique is a rapid-simple technique, of low cost and complications, and neither requires laparotomy nor causes diversion of urine and semen pass way. The technique can be used when it is planned to use the calf as a bull in the future.

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