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EVALUATION STUDY FOR AUTO-LIGATION OF VAS-DEFERENS METHOD TO TEASER BUCKS PREPARATION

Hussein Kareem Ibrahiem
Clinical Sciences Department/Veterinary Medicine Faculty/University of Kufa

ABSTRACT
Three healthy adult local breed Rams were subjected to vasectomy. The sexual desire time, ejaculate volume, mass motility, individual motility and sperm concentration were evaluated before operation as a control sample called (0) period and after 1, 2, 3, and 4 weeks. The sexual desire time was significantly longer ($p<0.05$) after 1-2 weeks of the operation than three, four weeks and control. Ejaculate volume was significantly lower ($p<0.05$) for 1, 2, 3 and 4 weeks as compared with control. Mass and individual motility were significantly lower ($p<0.05$) for 3 and 4 weeks as compared with first, second weeks and control. Sperm concentration was significantly lower ($p<0.05$) after 2, 3 and 4 weeks than the first week and control. The seminiferous tubules were lined by basal membrane with separated from connective tissue and showed damage in interstitial connective tissue, marked slightly proliferation of leydig cells, atrophied, degeneration and necrosis of germinal and sertoli cells. However, the epididymal head and tail were suffering from thickening, fibrosis in connective tissue and accumulation of large mass of sperms in the epididymal ductal lumen, sloughing and degenerative of the epithelia.

KEY WORDS: Teaser Bucks, Auto-ligation of vas deferens, Vasectomy, Vas deferens closure, Testicular histopathological changes.

INTRODUCTION

The term vasectomy is derived from the words “vas” referring to the vas deferens, the tube that transfers sperm from the testicle to the penis, and “-ectomy” the surgical term for dissecting out. So, a vasectomy is the surgical removal of a small piece of the vas deferens. The testicle remains undamaged and will continue to produce the sex hormone testosterone, so the animal will act exactly like a normal entire male animal (Cert, 2012).

As a result of the recent trend toward artificial insemination of purebred, multi ovulation and twins produce programs; a need has arisen for vasectomized buck that can be used to check goats for presence of estrus. A major obstacle to the development of successful artificial insemination programs on the farm has been the difficulty producers have had in detecting estrus. Aggressive, young, mature Bucks are best for detecting estrus in mature goats. However, breeders often hesitate to use these aggressive males for that purpose because they fear that these young Bucks might sire unplanned litters. Vasectomy is a highly effective, simple procedure that restricts the function of heat check males solely to detecting estrus. There are two types of detector animals are commonly used: surgically altered males and hormone treated animals. Vasectomized males are altered surgically so that normal mating may occur, but sperm transport is blocked (Stevenson and Britt, 1977). The procedure vasectomy classic technique was included a 3cm skin incision is made at the base of the scrotum and the vas deferens located by palpation. The vas deferens is moved to the incision and a 2cm length excised flowing double ligation of the two ends (Godke *et al*., 1979). Another technique was included the midline skin incision is made and the tunica dartos is divided until the parietal vaginal tunica is encountered. The testicle is stabilized and Allis forceps is inserted toward a caudal direction into vaginal cavity. The ductus deferens can be grasped in this area. It is separated from the mesoductus and should be ligated as far proximally and distally as possible. A large section of the interposing duct is removed (Lofstedt, 1982). Ligation and excision is the most common method used worldwide, though it is considered by many the least effective (Shih, 2011). Other methods used to improve vasal occlusion have included electrical and thermal cautery of the vas lumen (Mark *et al*., 2011). The vasa deferentia can also be occluded by an Intra-Vas device or "IVD". A small cut is made after which a soft silicone or urethane plug is inserted into each vas tube thereby blocking (occluding) sperm. This method allows for the vas to remain intact (Zhao *et al*., 1992).

No-scalpel vasectomy was developed and first performed in China in 1974 by Dr. Li Shunqiang of the Chongqing Family Planning Scientific Research Institute, located in Sichuan Province. At that time, vasectomy was unpopular with Chinese men, and tubal occlusion was the predominant method of voluntary sterilization. Today in Sichuan, vasectomy outnumbers tubal occlusion by a ratio of four to one; in the rest of China, tubal occlusion outnumbers vasectomy by five to one. More than 10 million Chinese men have already undergone no-scalpel vasectomy (Burket-piccolino and Costa, 1992).

The current birth control choices for men are limited to abstinence, withdrawal, condoms, and vasectomy. A host of new pharmacological and technological contraceptives for men are said to be just around the corner, as they have been for more than 40 years (Barry Rich, 2001). Therefore, the auto-ligation of vas deferens was suggested

to development vasectomy techniques with minimal pricing and side effect.

MATERIALS & METHODS

In this study, three healthy adult local breed Bucks were used. The sexual desire time, ejaculate volume, mass motility, individual motility and sperm concentration were evaluated before operation as a control sample called (0) period. The animals Prepared to surgery, clipping and shaving the scrotum area. The Bucks restrained in lateral recumbent position with the help of a sedative (Xyalzine 2%) in a dose of 0.2 mg/kg b.w. and the anterior lateral aspect of the scrotal neck and underlying tunica dartos are infiltrated with 2% lidocaine over a distance of 2-3cm. The neck of the scrotal skin is punctured and dilated by pointed scissor in the anterior lateral aspect of the spermatic cord. The connective tissue is separated by blunt dissection. The cord like vas deferens is palpated up by finger to the under surface of coiled veins and arteries then an opening is made in the vaginal tunic. The vas deferens is separated from the surrounding structures with a pair of curved blunt forceps and lifted through the opening. It is inflected around forceps axis from up to down, inverted toward upper side, the free end is catching after cutting its then, the end is pulling through the torsion part and returning separated portion of vas deferens into the spermatic cord. The same procedure is then repeated for the contralateral vas deferens to making bilateral auto-ligation of the vas deferens. The skin is closed in a routine manner. A course of antibiotic therapy was given for 3-5 days. The sexual desire time, ejaculate volume, mass motility, individual motility and sperm concentration were examined for four periods after operation (1, 2, 3 and 4 weeks) and compared with the control (0), which was taken before operation. The data were subjected to one way analysis of variance (ANOVA) to investigate the significance of periods for both variables. Least significant difference (LSD) was applied to compare between means. Gross examination and histopathological changes was performed on cross sections of testicular tissue one month after castration using $1cm^3$ from upper, middle, and lower part of the testicular parenchyma, as well as the epididymis and vas deferens were used to evaluate the severity of histopathological changes.

RESULTS

There were increased in sexual desire time at first week after the operation because of the pain and stress from the surgical operation. The desire time was return back to the normal levels at the later weeks. These details were showed in table (1) that the time of sexual desire was significantly longer ($p<0.05$) for 1 week after vasectomy (13.44 ± 0.99) than the rest of periods and control. However, the time of sexual desire for 2, 3, and 4 weeks declined with increase in weeks after operation.

TABLE 1: The sexual desire time

Weeks	0	1	2	3	4
Mean ± SE	A	B	C	A	A
	1.99 ± 0.2	13.44 ± 0.99	6.37 ± 0.54	2.49 ± 0.36	2.35 ± 0.1

(Capital letters) The mean difference is significant at the 0.05 level.

The ejaculate volume of semen was less than normal levels at the weeks after operation because of the sperms passage blockage with still the male system glands secretions. Therefore, table (2) revealed that ejaculate volume was significantly lower ($p<0.05$) for 1, 2, 3 and 4 weeks comparing with control.

TABLE 2: The ejaculate volume

Weeks	0	1	2	3	4
Mean ± SE	A	B	B	B	B
	0.78 ± 0.11	0.35 ± 0.07	0.25 ± 0.02	0.22 ± 0.01	0.22 ± 0.01

(Capital letters) The mean difference is significant at the 0.05 level.

The mass and individual motility were suffered from gradually dropping because of the sperms passage blockage with still some amounts from sperms storage in another male system parts. Therefore, the tables (3 and 4) was showed significantly lower ($p<0.05$) for 3 and 4 weeks comparing with first, second weeks and control. However, mass motility for first and second weeks was significantly lower than control. Also, it for first week was significantly lower than control.

TABLE 3: The mass motility

Weeks	0	1	2	3	4
Mean ± SE	A	B	C	D	D
	81.6 ± 6	32.3 ± 1.45	10.3 ± 0.88	0 ± 0	0 ± 0

(Capital letters) The mean difference is significant at the 0.05 level.

TABLE 4: The Individual motility

Weeks	0	1	2	3	4
Mean ± SE	A	B	C	D	D
	80 ± 2.88	28.3 ± 4.4	8.6 ± 0.88	0 ± 0	0 ± 0

(Capital letters) The mean difference is significant at the 0.05 level.

The sperm concentration was suffered from decreased because of the same reasons which said in the mass and individual motility. Accordingly, the table (5) showed that sperm concentration was significantly lower ($p<0.05$) for 2, 3 and 4 weeks comparing with first week and control. Also, sperm concentration for first week was significantly lower than control.

TABLE 5: Sperm concentrations (10^8/ml)

Weeks	0	1	2	3	4
Mean ± SE	A	B	C	C	C
	2.43 ± 0.27	0.93 ± 0.08	0.6 ± 0.05	0.05 ± 0.02	0 ± 0

(Capital letters) The mean difference is significant at the 0.05 level.

Adhesions between the scrotal skin and parietal layer of tunica vaginalis and between parietal layer of tunica vaginalis and visceral layer of tunica vaginalis in neck area were observed after castration with enlargement of the head and tail in size of the epididymis. The vas deferens was suffered from enlargement and swelling lesions like sac in the terminal end that containing yellowish milky fluid (Fig. I). The seminiferous tubules were lined by basal membrane with separated from connective tissue and showed destruction of the interstitial connective tissue, marked slightly proliferation of Leydig cells, atrophied, degeneration and necrosis of germinal and sertoli cells (Fig. J). However, the epididymal head and tail were suffering from thickening in connective tissue and accumulation of large mass of sperms in lumen of epididymal duct, sloughing and degeneration in epithelia (Fig. K). But, the vas deferens was showed distorted of connective tissue, sloughing, degeneration and necrosis in epithelial layer (Fig. L).

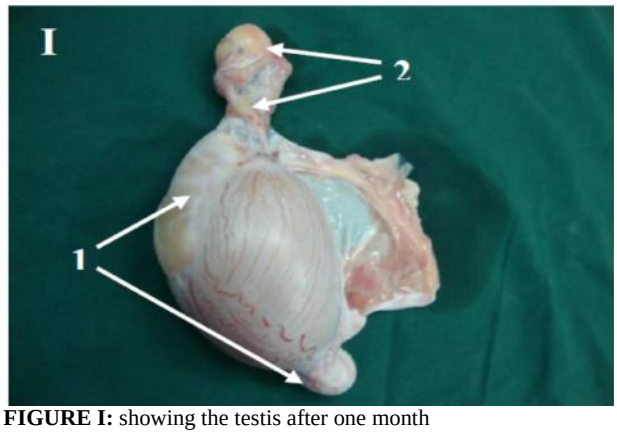

FIGURE I: showing the testis after one month
1) Enlargement head and tail of the epididymis.
2) The vas deferens was enlargement and swelling lesions like sac.

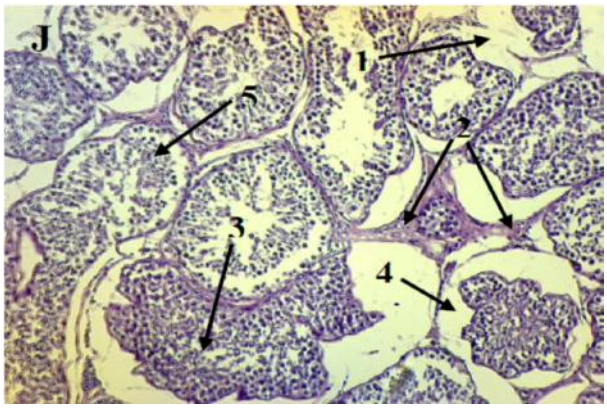

FIGURE J: show cross section of the testicular parenchyma after one month (H&E stain)(X40).
1) Destruction of the interstitial connective tissue.
2) Slightly proliferation of Leydig cells.
3) Atrophied of seminiferous tubules.
4) Seminiferous tubules were lined by basal membrane and separated from connective tissue.
5) Degeneration and necrosis of germinal and sertoli cells.

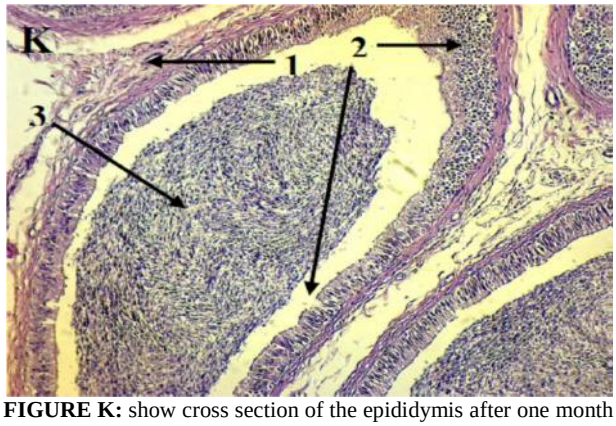

FIGURE K: show cross section of the epididymis after one month (H&E stain) (X40).
1) Thickening of the connective tissue.
2) Sloughing and degeneration of the epithelia.
3) Accumulation of large mass of sperms into epididymal ductal lumen.

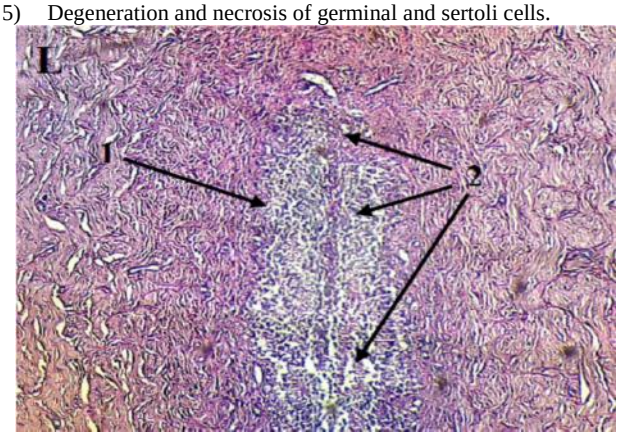

FIGURE L: show cross section of the vas deferens after one month (H&E stain) (X40).
1) Distorted of the connective tissue.
2) Sloughing, degeneration and necrosis of the epithelial layer.

Interaction of Obatanpa variety and sulfur rate of 10kg S/ha produced higher maize grain S content in 2007 though at par with its interaction with 5kg S/ha. When EV-99 interacted with 5kg S/ha higher maize grain S content was produced though at par with its interaction with 0kg S/ha, and 10kg S/ha.

DISCUSSION

The animals showed longest time of sexual desire after one week of vasectomy due to pain, fear and stress factors of the operation while in 2, 3 and 4 weeks after operation returns to normal because of the absence of these factors. This result is accorded with the result obtained by Manikandan *et al*., 2004 and Plant *et al*., 1979. The ejaculate volume of semen was less than normal levels at the weeks after operation because of the sperms passage blockage with found the male system glands secretions. Janet *et al*., 2001 were showed in the first ejaculate obtained 14 days post vasectomy all rams have a significant ($P<0.05$) drop in mean volume (from 1.2 to 0.5 mL). The sperm concentration, mass and individual motility were suffered from gradually dropping because of the sperms passage blockage with remaining some amounts from sperms storage in another male system parts. This sign agreed with that of Barone *et al*., 2003. As well as Sokal *et al*., 2004 was observed the primary outcome measure was time to azoospermia. Additional outcome measures were time to severe oligozoospermia (<100.000 sperm/mL) and vasectomy failure based on semen analyses. While Dhar *et al*., 2006 discovered the semen analysis was requested at 2 and 3 months after vasectomy in all 436 patients; 75% provided a semen specimen at 2 months, of which 75% were azoospermic and 25% had semen containing sperm. Bucks were suffered from pain and swelling in the portion of vas deferens ligature as well as the tail and head of the epididymis before the blockage area was resulted from semen accumulation in that parts. Manikandan *et al*., 2004 were considered that scrotal pain results from obstruction, increased pressure, induration and stagnation that may result in distension of the epididymis and possibly perineural fibrosis. The seminiferous tubules were lined by basal membrane with separated from connective tissue and showed damage in interstitial connective tissue, marked slightly proliferation of Leydig cells, atrophied, degeneration and necrosis of germinal and sertoli cells. Al-Maghrebi *et al*., 2011 were scored that based on the premise that with testicular damage, there is successive disappearance of the most mature cell type, with progressive degeneration of germinal epithelium: first, spermatozoa and spermatids, then spermatocytes and finally Sertoli's cells disappear in that order. Also Kong *et al*., 2004 were observed induced damage to spermatogenesis as primarily sloughing of spermatogenic cells with a greater reduction in the number of advanced (adluminal) cells in vasectomized of male Japanese white rabbits. And Sarrat *et al*., 1996 were said the hypertrophy was due to an increase in the collagen connective tissue content although we did not notice a proportional increase in the number of Leydig cells. This hypertrophied connective tissue seemed like a mould that drew the outline of the tubules in their first normal shape and situation. The epididymal head and tail were suffering from thickening in connective tissue and accumulation of large mass of sperms in lumen of epididymal duct, sloughing and degeneration in epithelia. But, the vas deferens was showed distorted of connective tissue, sloughing, degeneration and necrosis in epithelial layer. Chen and Ball, 1991 were observed mild ductal dilatation, interstitial fibrosis and spermatic granulomas were seen in the head (efferent ductules) and the tail (epididymal duct) to a similar degree. The vas deferens often appeared closely with severely angulated and distorted myelinated nerves surrounded by dense fibrous tissue. There is also a dense lymphocytic infiltrate associated with the presence of vasitis nodosa and spermatic granulomatosis.

CONCLUSION

The vasectomized Buck by auto-ligation of vas deferens method can be used to prepare the male detector of female estrus.The sexual desire, motility and concentration sperms as well as the histopathological changes in this method was similar to other vasectomy techniques because the blockage and semen accumulation before ligation part was pressured on that area.

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