



Post-Prostatectomy Epididymoorchitis: Is It Preventable by No Scalpel Vasectomy?

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Abstract

In spite of newer evolutions in the medical management of benign prostatic enlargement, surgery still continues to be an important modality. A prospective randomized controlled trial study conducted on 50 patients of benign prostate enlargement who were admitted inward from June 2007 to March 2010. Patients with diabetes mellitus or pre-existing epididymoorchitis were excluded from the study. All these patients were planned for prostatectomy (modified Freyer's/TURP) with NSV (study group) or without NSV (control group), each group consisting of twenty five assigned randomly. Preoperative urine culture was positive in 52% of the patients in study group and 48% of the patients in control group. *E coli* was the most common organism in both groups. 4% of patients in study group developed epididymoorchitis while incidence rate of epididymoorchitis was 8% in control group ($p \Rightarrow 0.05$). The difference in the two groups was statistically insignificant. The total number of cases investigated in this study was fifty, so it does not meet the minimum required for statistical analysis. Therefore, a large scale of study should be carried out in future.

Keywords

Catheterization Prostatectomy Vasectomy

Subject Areas: Public Health, Urology

1. Introduction

Prostate can be operated via transvesical, retropubic, perineal and transurethral approaches. Due to lack of effective antibiotics and wide use of gauge packing, the acute epididymoorchitis, an annoying complication of this procedure, has been reported in abundance. Therefore, vasectomy was recommended as a routine procedure for prostatectomy in order to prevent retrograde infection in testis and epididymis and decrease possibilities of epididymoorchitis.

With emergence of novel antibiotics, development of better surgical techniques and utilization of triluminal

catheter, the incidence of post-prostatectomy epididymorchitis decreased gradually and vasectomy as a prophylactic approach disappeared from the scene. Although TURP is considered to be the “gold standard” for benign prostate enlargement, due to inadequate trained urologists and increasing amount of patients requiring surgical intervention, a shortage of TURP therapy exists even today in most rural hospitals of developing countries like India. Therefore, although Modified Freyer’s Prostatectomy with vasectomy is considered as an out-dated procedure, it is still in use in many hospitals to prevent epididymorchitis, a complication caused by retrograde infection from urinary tract in patients with self-retaining catheter. Prophylactic vasectomy becomes again relevant, especially in such centres to prevent epididymorchitis due to retrograde infection in patients with prolonged self-retaining catheters.

A pre-prostatectomy vasectomy reduces incidence of epididymorchitis complication to 1% - 6% [1] [2]. Therefore, our study was designed to investigate the incidence of post-prostatectomy epididymorchitis complication and evaluate the role of vasectomy in prevention of this complication. With practice of No Scalpel Vasectomy, the procedure of vasectomy has become very simple and safe.

2. Aims and Objectives

- 1) To study the incidence of epididymorchitis, following surgery for benign enlargement of prostate (Modified Freyer’s/TURP) in patients with prolonged catheterization.
- 2) To compare the incidence of epididymorchitis with and without NSV. During prostatectomy.

3. Materials and Methods

A prospective randomized controlled trial study conducted on 50 patients of benign prostate enlargement who were admitted in ward from June 2007 to March 2010. Patient with diabetes mellitus or pre-existing epididymorchitis were excluded from the study. All these patients were planned for prostatectomy (modified Freyer’s/TURP) with NSV (study group) or without NSV (control group), each group consists of twenty five assigned randomly. A written informed consent was taken from each patient before enrollment to the study, explaining them about the study purpose, operative procedure, the risk/complications involved and the remedies thereof. Vas was fixed with three finger technique and sacrotal wall was punctured anteriorly at the junction of upper one third and lower two third with NSV forceps. Vas was caught and delivered. Mesentery of vas was swept and both ends ligated with silk and divided with a biopsy of removed vas segment. The same procedure was repeated on other side. Prostatic adenoma was enucleated by blunt dissection with finger and prostatic fossa was packed with wet roll gauze for 5 - 10 minutes. A triluminal Foley’s catheter was put after satisfactory hemostasis and bulb of the catheter was inflated with 30 - 40 cc of normal saline. Irrigation was started with 1.5% glycine after closing urinary bladder in two layers. A retropubic drain was put and abdominal wall was closed in layers. The prostatectomy specimen and the resected segments of vas deferens were sent for histopathological examination. All patient were given antibiotics postoperatively (cefotaxime and amikacin). Irrigation was continued till passage of clear urine. Urinary culture was done on 3rd postoperative day. Foley’s catheter was removed and catheter tip was sent for culture and sensitivity. Postoperative complications were documented as per performa. On follow up, all patients were clinically examined and urine was taken for culture and sensitivity. Postoperative epididymorchitis was treated by scrotal support, analgesics and antibiotics. It got resolved in all cases without any complication.

At the end of study, the data was compiled and analysed as per standard statistical methods.

4. Results

Majority of the patients *i.e.* 68% in both the groups belongs to 7th and 8th decade as showed in **Table 1**. Six percent patients were beyond the age of 80 year.

Oldest person was 90 years of age. Mean age in the study and control group was 68.96 and 66.84 years respectively. There was no statistical difference between two groups with respect to the age of the patients ($p = 0.337$).

5. Presenting Symptoms

Table 2 shows that all patients in this study had Foley’s catheter in situ due to retention of urine. Prior to reten-

Table 1. Age distribution.

Age group (Years)	Study group		Control group		Total	
	No. of patients (n = 25)	%	No. of patients (n = 25)	%	No.	%
51 - 60	06	24	07	28	13	26
61 - 70	10	40	12	48	22	44
71 - 80	07	28	05	20	12	24
81 - 90	02	08	01	04	03	06

Table 2. Presenting symptoms.

Serial. No.	Presenting symptoms	Study group		Control group		Total	
		No. of patients	%	No. of patients	%	No. of patients	%
Obstructive							
1	Retention	25	100	25	100	50	100
2	Dribbling	25	100	24	96	49	98
3	Thinning of stream	17	68	18	72	35	70
4	Sensation of poor bladder emptying	08	32	05	20	13	26
5	Hesitancy	05	20	04	16	09	18
6	Intermittancy	02	08	02	08	04	08
Irritative							
1	Nocturia	19	76	13	52	32	64
2	Frequency	19	76	13	52	32	64
3	Burning micturition	13	52	06	24	19	38
4	Urgency	03	12	04	16	07	14

tion almost all (98%) had dribbling of urine. Thinning of stream was the next common symptom in 68% of the cases in study group and 72% of the cases in control group. Sensation of poor bladder emptying and hesitancy were present in 32% and 20% of the cases in study group respectively while 20% and 16% of the cases in control group had these symptoms.

Irritative symptoms (nocturia and frequency) were present in 76% of cases in study group and 52% of the cases in control group. Burning micturition was present in 52% of the cases in study group and 24% of the cases in control group.

6. Preoperative Urine Culture

Table 3 shows that preoperative urine culture was positive in 52% of the patients in study group and 48% of the patients in control group. *E. coli* was the commonest organism in both the groups (40% of cases in study group and 32% of cases in control group). *Klebsiella* was next common organism in control group in 12% of the patients and *Proteus* in 4%. In the study group *Klebsiella*, *Pseudomonas* & *Enterobacter* were seen 4% of the cases each. Urine was sterile preoperatively in 48% of the cases in study group and 52% of the cases in control group.

No patient had mixed organisms in culture. Two groups were comparable statistically with respect to various preoperative urine culture findings ($p = 0.512$).

7. Preoperative Catheter Duration

All the patients in this study were catheterized preoperatively. Preoperative indwelling catheter was there for 1 - 3 weeks in 60% of the cases in study group and 64% of the cases in control group. Patients were in waiting list for surgery with indwelling catheter for more than three weeks duration in 24% of the cases in study group & 28% of the cases in control group. Only 8% of the catheterized patients could be operated in first week in control group as compared to 16% cases in study group. Average duration of catheterization in study group was 21.12 days and in control group was 18.68 days. There was no statistical difference between two groups with respect to the duration of indwelling catheter preoperatively ($p = 0.574$).

Table 3. Preoperative urine culture.

Serial. No.	Organism	Study group		Control group		Total	
		No. of patients (n = 25)	%	No. of patients (n = 25)	%	No. of patients	%
1	<i>E. coli</i>	10	40	08	32	18	36
2	Klebsiella	01	04	03	12	04	08
3	Proteus	00	00	01	04	01	02
4	Pseudomonas	01	04	00	00	01	02
5	Enterobacter	01	04	00	00	01	02
6	Others	00	00	00	00	00	00
7	Sterile	12	48	13	52	25	50
8	Mixed	00	00	00	00	00	00

8. Postoperative Complications

Table 4 shows that postoperative hemorrhage was most common complication occurring in 20% patients in study group as compared to 24% cases in control group. Temporary urinary incontinence occurred in 12% patients in study group & 16% cases in control group. Wound infection occurred in 12% cases in study group and 8% cases in control group. Epididymo-orchitis developed in 4% patients in study group as compared to 8% in control group.

Clot retention occurred in 4% cases in each group. Wound dehiscence occurred in 4% of cases in control group as compared to none in control group. No patient developed hematoma in our study. Two groups were comparable statistically with respect to the postoperative complications ($p = 0.884$).

9. Postoperative Urine Culture

Analysis of **Table 5** shows that *E. coli* was the commonest bacteria in urine cultures in 4 cases in study group and in 3 cases in control group on third postoperative day. Catheter tips were sterile in 19 cases in study group and in 15 cases in control group. Enterobacter was next common organism in 1 case of the study group and 3 cases of the control group. Klebsiella was found in 1 case of study group and 2 cases of the control group. No urine culture report showed mixed flora.

10. Discussion

Postoperative epididymo-orchitis is a well recognized complication of prostatectomy. Ligation and section of vas deferens as a prophylaxis against post-prostatectomy epididymo-orchitis was an accepted procedure. Goldstein in 1926 found that epididymitis occurred in 4% cases with vasectomy and was of very mild degree while epididymitis occurred in 20% non-vasectomised patients [3]. Lynn and Nesbit in 1948 reviewed cases of prostatectomy with or without vasectomy to know the incidence of postoperative epididymitis following prostatectomy [1]. Postoperatively, epididymo-orchitis occurred in 2.7% of vasectomised patients as compared to 4% in non vasectomised patients [4]. Schmidt and Hinman revealed that 3.75% cases developed epididymitis in vasectomy group while 15.05% of cases developed epididymitis in nonvasectomy group [5]. Reeves and associates revealed an incidence of 6.2% on non vasectomised side and 2.8% on the vasectomised side [6]. They concluded that patients with sterile or infected urine and on catheter drainage were helped by prophylactic vasectomy. Prophylactic preoperative vasectomy was undoubtedly a worthwhile procedure 30 - 40 years ago. Whether or not it is still necessary, remains a controversial issue. The literature contains many attempts to settle the question but because most studies have been poorly controlled, retrospective, and on numbers too small to detect a significant difference in a problem that occurs in only 1% - 6% of cases, opinion remains divided. For the time being, the available evidence suggests that vasectomy performed prior to any urethral instrumentation reduces postoperative epididymo-orchitis. Keeping in view the above facts, present study was planned.

11. Preoperative Urine Culture

As depicted in **Table 6**, Melchior & Assoc. reported that *E. coli* followed by *Pseudomonas* were most common organisms [7]. Foo reported that *E. coli* and *Klebsiella* as most common organisms [8]. In this study preopera-

Table 4. Postoperative complications.

Serial. No.	Complications	Study group		Control group		Total	
		No. of patients (n = 25)	%	No. of patients (n = 25)	%	No. of patients	%
1	Hemorrhage	05	20	06	24	11	22
2	Temporary urinary incontinence	03	12	04	16	07	14
3	Wound infection	03	12	02	08	05	10
4	Epididymoorchitis	01	04	02	08	03	06
5	Clot retention	01	04	01	04	02	04
6	Wound dehiscence	01	04	00	00	01	02
7	Haematoma	00	00	00	00	00	00
8	Vas granuloma	00	00	00	00	00	00
9	Secondary hydrocele	00	00	00	00	00	00

Table 5. Postoperative urine cultures.

Serial. No.	Postop. duration	<i>E. coli</i>		Klebsiella		Proteus		Pseudomonas		Enterobacter		Sterile		Mixed	
		St	Ct	St	Ct	St	Ct	St	Ct	St	Ct	St	Ct	St	Ct
1	3rd day	04	03	01	02	00	01	01	00	01	03	18	16	00	00
2	Catheter tip	03	04	01	02	00	01	01	00	01	03	19	15	00	00
3	1 wk	02	03	01	02	00	01	01	00	02	00	19	19	00	00
4	2 wk	01	00	00	00	00	00	00	00	00	03	00	00	00	00
5	3 wk	00	00	00	00	00	00	00	00	00	01	00	00	00	00
6	4 wk	00	00	00	00	00	00	00	00	00	00	00	00	00	00
7	8 wk	00	00	00	00	00	00	00	00	00	00	00	00	00	00
8	12 wk	00	00	00	00	00	00	00	00	00	00	00	00	00	00

St = Study group, Ct = Control group, wk = Week.

Table 6. Preoperative urine culture.

Serial. No.	Author	Year	No. of cases (n)	Preop. urine culture	
				Positive (% of total)	Most common bacteria
1	Melchior & Assoc.	1974	2223	23	<i>E. coli</i> Pseudomonas
2	Foo	1980	168	-	Pseudomonas Klebsiella
3	Study group	2010	25	52	<i>E. coli</i> Klebsiella
4	Control group	2010	25	48	<i>E. coli</i> Klebsiella

tive urine cultures were positive in 52% cases in study group & in 48 % cases in control group.

All patients in this study had one or more episodes of acute urinary retention requiring catheterization which is an important source of urinary infection. Moreover, majority of them were catheterized by unqualified practitioners at periphery. *E. coli* followed by Klebsiella were the commonest organisms in both groups.

Melchior & Assoc. in 1974 reviewed 2223 cases with mean preoperative catheter duration of 14 days [7]. All patients in this study were catheterized preoperatively. Preoperative indwelling catheter was there for 1 - 3 weeks in 60% of the cases in study group and 64% of the cases in control group. Mean duration of preoperative catheter in study group was 21.12 days & in control group 18.68 days. Both these groups were comparable in mean duration of preoperative catheterization & had no statistical difference. Majority of these patients were catheterized at peripheral hospitals & reported to our institute after some days or weeks due to late referral, illiteracy, poverty & distant location. Moreover, these patients could not be operated early because of long waiting lists of surgeries & unfitness due to associated medical illnesses. Mean duration of preoperative catheter in present study was more as compared to other studies possibly because of long waiting lists for surgeries.

12. Postoperative Urine Culture

Table 7 shows that Foo in 1980 analyses 168 cases of prostatectomy and found Klebsiella and Pseudomonas as

Table 7. Postoperative urine culture.

Serial. No.	Author	Year	No. of cases	Urine culture
1	Nielson & Assoc.	1981	110	<i>E. coli</i> Staphylococcus
2	KT Foo	1980	168	Klebsiella Pseudomonas
3	Study group	2010	25	<i>E. coli</i> Enterobacter
4	Control group	2010	25	<i>E. coli</i> Enterobacter

most common organism [8]. Nielson & Assoc. in 1981 analysed 110 cases with *E. coli* as commonest & Staphylococcus as 2nd commonest bacteria [9].

In the present study postoperative urine culture showed *E. coli* as the commonest & Enterobacter as 2nd most common bacteria in both groups. *E. coli* was also commonest organism reoperatively. However, Enterobacter had replaced Klebsiella as second commonest organism. It might be due to infection by hospital acquired drug resistant strains of Enterobacter which were resistant to routinely given postoperative antibiotics.

13. Postoperative Complications

Table 8 shows that Foo reported incidence of clot retention, haemorrhage and temporary urinary incontinence in 4.8%, 7.0% & 5.4% cases respectively. Beng & Prabhakaran revealed clot retention in 4% cases and temporary incontinence was noticed in 4.5% cases [10]. Kupeli & Assoc. in 2001 reported haemorrhage in 23% cases and no patient had temporary incontinence [11].

In present study clot retention, postoperative haemorrhage and temporary urinary incontinence occurred in 4%, 20% & 12% cases respectively in study group while 4%, 24%, & 16% in control group which are statistically comparable with literature.

14. Post-Prostatectomy Epididymoorchitis

Table 9 shows that Lynn & Nesbit reported epididymoorchitis in 2.7% of the cases with vasectomy and in 4% of the cases without vasectomy [1]. Schmidt & Hinman found Epididymoorchitis in 2.7% case with vasectomy & in 9.1% cases without vasectomy [5]. Graham & Grayhack reported epididymoorchitis in 1.5% of the cases with vasectomy & in 6.2% of the cases without vasectomy [12]. Reeves & Assoc. revealed epididymoorchitis in 2.8% of the cases with vasectomy & in 6.2% of the cases without vasectomy [6]. Mebust and associates reported 0.2% incidence of epididymoorchitis after TURP [13]. Holtgrewe and Valkstudy in TURP cases found that 6.1% patients developed epididymitis [14]. Beng and Prabhakaran in 1977 evaluated cases of TURP and open prostatectomy and results of both methods of surgery were presented and analysed [10]. There were equal number of positive urine cultures in both groups but more cases of symptomatic urinary tract infections and epididymoorchitis (9% & 2%) were noted in the open group. Rinker and associates in 1970 reviewed 1029 cases of prostatectomies [15]. A conventional vasectomy was done which reduced incidence of postprostatectomy-epididymoorchitis from about 4% to 1%. Foo in 1980 analysed 168 cases (TURP and open) and Epididymoorchitis developed in 1.2% cases. Mebust and associates in 1989 reported the morbidity and mortality in 3885 patients reviewed retrospectively. Prophylactic vasectomy was done in 10.5% of the patients which reduced incidence of epididymitis from 0.2% to 0.18%. Fournier and associates in 1995 reported two cases of acute epididymoorchitis developing 4 to 6 weeks after cryoablation of prostate cancer [16]. Kuzaka and associates in 2007 retrospectively reviewed 6811 patients with BPH treated during the last 24 years who underwent suprapubic and transurethral prostatectomy to evaluate the incidence of postoperative epididymitis [17]. Acute epididymitis was diagnosed in 0.64% of the patients, more common in transvesical prostatectomies (1.53%) than transurethral prostatectomies (0.11%). Inflammation of the verumontanum appears necessary for the entry of bacteria into the ejaculatory ducts [18]. Bacteria travel up the ejaculatory ducts to reach the seminal vesicles which get infected and force bacteria up the tail of epididymis. This study supported the belief that epididymitis occurring after vasectomy was probably due to pre-existing deposits of infectious material in epididymis and not due to ascending infection.

In present study post-prostatectomy epididymoorchitis developed in 4% of the cases in study group & 8% of the cases in control group. The difference between two groups is statistically nonsignificant (p value => 0.05). In present study, all patients had one or more episodes of acute urinary retention requiring catheterization which

Table 8. Postoperative complications.

Study	Year	No. of cases (n)	Clot retention (%)	Haemorrhage (%)	Temporary urinary incontinence (%)
Foo	1980	168	4.8	7.0	5.4
Beng & Prabhakaran	1977	200	4.0	None	4.5
Kupeli & Assoc.	2001	100	None	23	None
Study group	2010	25	4.0	20.0	12.0
Control group	2010	25	4.0	24.0	16.0

Table 9. Post-prostatectomy epididymoorchitis.

Serial. No.	Author	Year	Total cases	Epididymoorchitis incidence	
				Vasectomised	Non vasectomized
1	Lynn & Nesbit	1948	600	2.7%	4%
2	Reeves & Assoc.	1964	421	2.8%	6.2%
3	Graham & Grayhack	1962	194	1.5%	6.2%
4	Schmidt & Hinman	1950	508	2.7%	9.1%
5	Study group	2010	25	4%	-
6	Control group	2010	25	-	8%

is important source of urinary infection. Moreover, majority of them were catheterized by unqualified practitioners under unsterilized conditions at periphery. Large size of prostate & associated urinary infection leads to cascade of urinary stasis & inflammation of prostate & urethra.

15. Conclusion

Post-prostatectomy epididymoorchitis developed in 3 cases in present study, one case in study group and two cases in control group. The difference in the two groups was statistically insignificant. Since total number of cases in present study was fifty only which was too small a number to draw any reliable conclusion. Therefore, a large study is recommended to draw any statistically significant conclusion.

References

- [1] Lynn, J.M. and Nesbit, R.M. (1948) The Influence of Vasectomy upon the Incidence of Epididymitis Following Transurethral Prostatectomy. *Journal of Urology*, **59**, 72-75.
- [2] Drach, G.W. (1978) Diagnosis & Management of Infectious Complications of Urologic Surgery. In: Wagenkur, E.M.E., Ed., *Urology in Practice*, 1st Edition, Little Brown and Co., London, 484-485.
- [3] Goldstein, A.E. (1927) Bilateral Ligation of the vas Deferens in Prostatectomy. *Journal of Urology*, **17**, 25-35.
- [4] Fowler, C.G. (2004) Testis and Scrotum. In: Russell, R.C.G., Williams, N.S. and Christopher, J.K., Eds., *Bailey and Love's Short Practice of Surgery*, 24th Edition, Arnold, London, 1403-1416.
- [5] Schmidt, S.S. and Hinman, F. (1950) The Effect of Vasectomy upon the Incidence of Epididymitis after Prostatectomy: An Analysis of 810 Operations. *Journal of Urology*, **63**, 872-881.
- [6] Reeves, J.F., Scott, R. and Scott, F.B. (1964) Prevention of Epididymitis after Prostatectomy by Prophylactic Antibiotics and Partial Vasectomy. *Journal of Urology*, **92**, 528.
- [7] Melchior, J., Walk, W.L. and Foret, J.D. (1974) Transurethral Prostatectomy and Epididymitis. *Journal of Urology*, **112**, 647-649.
- [8] Foo, K.T. (1980) Aspects of Transurethral Resection of Prostate for Obstructing Prostatic Adenoma. *S'pore Medical Journal*, **21**, 620-626.
- [9] Nielson, O.S., Maigaard, S., Fridmodt, M. and Madson, P. (1981) Prophylactic Antibiotics in Transurethral Prostatectomy. *Journal of Urology*, **126**, 60.
- [10] Beng, K.S. and Prabhakaran, K. (1977) Transurethral Resection of Prostate and Open Prostatectomy—Experiences in General Surgical Unit. *S'pore Medical Journal*, **18**, 237-241.
- [11] Kupeli, S., Yilmaz, E., Soygur, T. and Budak, M. (2001) Randomized Study of Transurethral Resection of the Prostate and Combined Transurethral Resection and Vaporization of the Prostate as a Therapeutic Alternative in Men with be-

- nign Prostatic Hyperplasia. *Journal of Endourology*, **15**, 317-320. <http://dx.doi.org/10.1089/089277901750161935>
- [12] Graham, J.B. and Grayhack, J.T. (1962) Epididymitis Following Unilateral Vasectomy and Prostatic Surgery. *Journal of Urology*, **87**, 582.
- [13] Mebust, W.K., Holtgrewe, H.L., Cockett, A.T.K. and Peters, P.C. (1989) Transurethral Prostatectomy: Immediate and Postoperative Complications. A Cooperative Study of 13 Participating Institutions Evaluating 3885 Patients. *Journal of Urology*, **141**, 243-247.
- [14] Holtgrewe, H.L. and Valk, W.L. (1962) Factors Influencing the Mortality and Morbidity of Transurethral Prostatectomy, a Study of 2015 Cases. *Journal of Urology*, **87**, 450-459.
- [15] Rinker, J.R. and Henderson, W.D. (1970) A Statistical Study of Unilateral Prophylactic Vasectomy in the Prevention of Epididymitis: 1029 Cases. *Journal of Urology*, **104**, 303.
- [16] Fournier, G., Indudhara, R., Gajendran, V., Huang, E. and Narayan, P. (2009) Epididymorchitis after Cryoablation of Prostate for Prostate Cancer. *Journal of Endourology*, **9**, 349-351. <http://dx.doi.org/10.1089/end.1995.9.349>
- [17] Kuzaka, B., Borkowski, T., Kuzaka, P. and Czaplicki, M. (2007) Epididymitis after Prostatic Adenomectomy—24-Years Observations. *Przegląd Lekarski*, **64**, 1018-1021.
- [18] Rolnick, H.C. (1925) Mechanism of Epididymitis. *SurgGynaeObst*, **41**, 15-20.