

Research Article

Modified technique in Freyer's prostatectomy to achieve hemostasis

Swapnil Madankar*, Vijay Kanake

Department of Surgery, IGMC, Nagpur, Maharashtra, India

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***Correspondence:**

Dr. Swapnil Madankar,

E-mail: spmadankar@gmail.com

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ABSTRACT

Background: The ratio of open surgery to endoscopic resection has large variations among different countries like India. Although TURP is considered as the gold standard, it is still out of reach for a vast majority of rural population due to the unavailability of expertise or equipment. One of the major complications of open prostatectomy is persistent bleeding from prostate bed. This study is an attempt to develop a technique by which complete hemostasis can be achieved by giving traction to the Foley's catheter thereby compressing the venous plexus and the avulsed prostate arteries at the bladder neck by the inflated balloon thereby reducing blood loss in open prostatectomy.

Methods: A total of 130 cases of BPH were operated by Freyer's suprapubic trans-vesicle prostatectomy. Bladder mucosa is repositioned below the balloon and the balloon inflated to 60ml of normal saline and traction is applied to the catheter and maintained by strapping the catheter to the thigh of the patient for 24-48 hours.

Results: The average blood loss was 20.9 ml which proves that the Foley's balloon pressure traction method at the bladder neck is effective in achieving hemostasis in patients undergoing open prostatectomy.

Conclusions: The balloon pressure technique is an effective method of achieving hemostasis and avoids blood transfusion in almost all of the patients treated.

Keywords: BHP, Freyer's suprapubic trans-vesicle prostatectomy, Foley's balloon pressure traction, Blood loss

INTRODUCTION

Benign prostatic hyperplasia is the most common benign tumor in men and its incidence is age related¹ Surgery for BPH has evolved from the days of perineal approach to currently popular transurethral resection. Until 20-25 years ago, while open surgery was the most common approach, in the late 1970s, the development of endoscopes gradually reduced the open surgical operations.² The ratio of open surgery to endoscopic resection has large variations among different countries and even among the various areas of vast country like India. Although TURP is considered as the gold standard, it is still out of reach for a vast majority of rural population due to the unavailability of expertise or equipment's. The rate of complications has come down heavily but still complete hemostasis remains an enigma.

History elucidates the continuous attempts done to achieve complete hemostasis. This is because the prostate is deeply situated in the pelvis and its bloody supply comes from the deeper planes. This study is an attempt to develop a technique by which complete hemostasis can be achieved on table by giving traction to the Foley's catheter thereby compressing the venous plexus and the avulsed prostatic arteries at the bladder neck by the inflated balloon. This technique is an innovation in the open prostatectomy which can be widely practiced in rural areas.

METHODS

The present study was conducted from June 2007 to October 2009, in the patients of BPH admitted in surgery ward at the Indira Gandhi Medical College and Hospital,

Nagpur, after the approval from the ethical committee of the above institute and with legal consent of patients. The procedure was carried out under the supervision of senior surgeons.

Patient selection: A total of 130 cases of BPH operated by Freyer's suprapubic trans vesicle prostatectomy. All the patients presented with symptomatic BPH and diagnosed to have prostatomegaly on per-rectal examination and on sonography. They were all admitted and treated as in patients.

Operative workshop: Detailed clinical history of each patient was recorded and AUA symptom score was calculated. All patients were subjected to through clinical examination. Renal function tests, serum electrolytes, urine culture and antibiotic sensitivity were done for all patients. X-ray KUB and USG KUB were done and prostate size was done and prostate size and post void residual urine was calculated. Serum PSA was done only if Digital Rectal Examination was suspicious.

Surgery: After making the bladder full with normal saline by per urethral catheter, a supra pubic midline incision was taken and abdomen opened in layers. Bladder was opened with a stab knife. Prostate was supported with a finger passed per rectally and enucleation of prostate was done. After enucleation of prostate, in addition to index finger, middle finger was inserted and the rectum was pulled caudally. This helps to exert minimum pressure over the venous plexus. A 24 No. Three ways Foley's catheter with balloon capacity of 75-80 ml is placed in the bladder and the bladder mucosa is repositioned below the balloon posteriorly, by the finger. The balloon is inflated to 60ml of normal saline and is kept at the bladder neck and traction is applied to the catheter. Traction is maintained by strapping the catheter to the thigh of the patient with sticking plaster. Hemostasis assured and bladder is closed primarily in two layers. No Suprapubic and retro pubic drain is kept. Irrigation is started as a precautionary measure and wound is closed in layers. Traction is removed after 24 to 48 hours and balloon deflated gradually. Foley's removed on seventh post-operative day and patient is discharged after suture removal on tenth day.

Calculation of blood loss: Study of intraoperative blood loss was calculated by weight of sponges³ pre and post operatively soaked with blood. This gives the amount of loss in sponge (1 gm = 1 ml)³ to which the amount of blood in the suction bottle was added. Study of post-operative blood loss was done by calculating the urine for 24 hours and calculating the urine hemoglobin by photoelectric calorimeter by sinemethhaemoglobin method. Post-operative blood loss is calculated by formula.⁴

$$\text{Post-operative blood loss} = \frac{\text{Hb\% Urine}}{\text{Hb\% Patient}} \times \text{Volume of urine (24 h)}$$

RESULTS

The blood loss was calculated by above formula for all patients. Mean amount of postoperative blood loss was 20.9 ml. All patients had blood loss in range of 0 to 50 ml. None of the patient had blood loss greater than 50 ml.

Table 1: Blood loss.

Blood loss in cc	Study group
0-50	130
>50 cc	-
Average blood loss	20.9 ml

DISCUSSION

McGill and Belfield described suprapubic transvesical partial enucleation of prostate in late 1800s. Fuller and Frayer popularized the technique of complete enucleation of gland.⁵ However hemostasis from this procedure was far from satisfactory as bleeders were not directly visible. The concept of control of hemorrhage by separation of the bladder neck from the prostate fossa was presented by Lower and Harris using non absorbable bladder neck sutures.⁵ Hryntschak modified and popularized the technique in 1951. Dela Pena and Alcina proposed separation of bladder cavity from the prostate fossa using a removable purse string suture in 1962.⁵ Malement popularized the removable partition suture, which is recommended only in cases of excessive bleeding in textbooks.^{6,7}

The average blood loss in our study was 20.9 ml. All patients in the study group had blood loss ranging from 10 to 50 ml. In our study, two patients required blood transfusion as the hemoglobin was less than 9% preoperatively. Naninga and O'Coner in their study noted blood loss of more than 100ml is just 15% patients treated with balloon traction technique which is little more in comparison with our study.⁸

Condie et al., reported 1 % blood transfusion rate which is comparable with our study⁹ Sheen and Quinlan used early suture control at 3 o'clock and 9 o'clock for achieving hemostasis. They reported a mean blood loss of 841 ml in their study.¹⁰ This is significantly higher than our study. This shows that Foley's pressure traction technique achieves better hemostasis than direct suture control. Similarly, Moon reported a blood transfusion rate of 83.3 % in patients undergoing Freyer's Prostatectomy when standard technique was used.¹¹ This is significantly higher than our study.

Table 2: Comparison of blood loss.

Study group	Blood loss (ml)
Sheen and Quinlan	841
Present study	20.9

Ceylan K reported a significant blood loss rate of only 3.2 % in his study. He has used both 3 o'clock and 9 o'clock position as well as traction at the bladder to achieve hemostasis. As a corollary, it can thus be inferred that while suture technique alone is ineffective in achieving hemostasis, traction at the bladder achieves hemostasis.¹²

Traction at the bladder neck also has the advantage of allowing normal involution of prostatic fossa and thus aids in ensuring complete hemostasis which is the significant advantage over the technique of keeping inflated balloon in the prostatic fossa, wherein this normal involution is hampered and rebound hemorrhage is common. Goodyear and Beard have shown by the means of serial postoperative urethrograms of prostatic fossa, like the uterus, contracts to 50 percent of its size within few minutes, to 25% in 6 to 12 hours and gradually it contracts completely. This is an important mechanism to achieve hemostasis postoperatively.¹³

In contrast to packing of prostatic fossa which interferes with its normal involuntary response, the Foley's balloon pressure traction technique not only allows the normal contraction of prostatic fossa but also aids it.

CONCLUSION

The balloon pressure technique is an effective method of achieving hemostasis and avoids blood transfusion in almost all of the patients treated. Hence, open prostatectomy with Foley's balloon pressure traction technique for BPH is an acceptable option with a high degree of safety and efficacy in areas where the TURP equipment or the surgical expertise is lacking and out of reach of rural population.

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Conflict of interest: None declared

Ethical approval: The study was approved by the ethics committee of Indira Gandhi Medical College and Hospital, Nagpur

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