



Simultaneous Bilateral Anterior Inguinal Herniorrhaphy with Polypropylene Mesh Application and Open Prostatectomy

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Authors' contributions

This work was carried out in collaboration between all authors. Author ND designed the study, performed the surgical operations and managed the analyses of the study. Author AM prepared proposal of study, managed the case selection and outcome analysis. Author JJ contributed in preparing proposal, data collection and patient's follow-up. Author JA wrote the first draft of the manuscript, managed the literature searches and preformed outcome analysis. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Lower urinary tract symptoms (LUTS) are common in aging men. Benign prostatic hyperplasia (BPH) develops with advancing age. The incidence of inguinal hernia also increases with age. A significant number of elderly men with symptoms of BPH have inguinal hernia at the same time. Simultaneous preperitoneal inguinal hernia repair with other pelvic surgeries has been described, but it was not popular among urologists and general surgeons mainly because of high recurrence rate.

Study Design: Prospective study.

Place and Duration of Study: Department of Urology, Tabriz University of Medical Sciences, Imam Reza Hospital, between March 2010 and September 2013

Methodology: We evaluated the outcomes and complications of 37 patients who underwent open transvesical prostatectomy and simultaneous bilateral preperitoneal herniorrhaphy with application of polypropylene mesh.

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Results: Twelve patients with bilateral direct hernia, 24 patients with bilateral indirect hernia and one patient with right side direct and left side indirect inguinal hernia were enrolled in our study. Four patients (10.8%) had bilateral recurrent hernias and 2 others (5.4%) had recurrent hernia on one side and primary hernia on the other side. Mean operation time was 86 minutes (71-110). The mean blood loss during surgery was 578 (240-1250)ml. The median clinical follow-up time was 13.7 months. During follow-up period surgical site infection, hematoma, chronic pain and recurrence were not detected. One (2.7%) lymphocele formation was detected. In all patients, the surgical outcomes were satisfactory.

Conclusion: Simultaneous prostatectomy and preperitoneal herniorrhaphy with mesh application, is a convenient and safe procedure which can be performed easily by urologists. This procedure is both cost effective and time-saving and achieves long term beneficial outcomes for patients.

Keywords: Inguinal herniorrhaphy; polypropylene mesh; prostatectomy; simultaneous.

1. INTRODUCTION

Lower urinary tract symptoms (LUTS) are common in aging men. Several etiologic factors have been proposed for the genesis of urinary symptoms, including the effects of aging on the nervous system and bladder, metabolic disorders, changes in fluids balance, obstruction and overactive bladder [1]. Benign prostatic hyperplasia (BPH) histologically develops with age and its onset begins from 25 to 30 years. After the age of 45, the prevalence of benign prostatic hyperplasia quickly rises, reaching 90% at the age of 90. Benign Prostatic Hyperplasia occurs due to the increase in number of epithelial cells and stromal cells in periurethral area, which is called prostatic urethra. Benign prostatic enlargement occurs in half of men with microscopic benign prostatic hyperplasia, causing obstructive symptoms [2]. Different treatments for BPH are available. Treatment option is chosen according to the severity of symptoms, prostate volume, patient's desire and other factors. Transurethral resection of the prostate (TURP) and open prostatectomy are two common surgical methods [3].

The incidence of inguinal hernia also increases with age. The prevalence in men over 75 years is about 50% [4]. Several factors are involved in its development, including obesity and physical activity resulting in high intra-abdominal pressure, and lower urinary tract symptoms (strenuous effort to urinate). For urologists dealing with such patients is not uncommon [5].

A significant number of elderly men with symptoms of BPH have inguinal hernia. The incidence in patients who are candidate for prostate surgery is about 15-25% [2]. Eleven to thirty percent of the patients with LUTS history, who undergo inguinal herniorrhaphy, have

urinary retention after surgery and consequently need urological intervention [6-9]. Untreated bladder outlet obstruction (BOO) may contribute to recurrence of inguinal hernia [10]. Given that bladder outlet obstruction is one of the etiologic factors for inguinal hernia, there for in patients with concurrent BPH and inguinal hernia, obstruction must be treated by performing TURP or open prostatectomy before than inguinal herniorrhaphy, however both condition can be treated simultaneously [3]. In this study our aim was to evaluate the outcome of transvesical prostatectomy and bilateral inguinal hernia repair performed in a single procedure.

2. PATIENTS AND METHODS

Patients with BPH and bilateral inguinal hernia who were referred to the urology clinic of Imam Reza hospital, Tabriz University of Medical Sciences, from March 2010 to September 2013 were enrolled in our study after full explanation and patients' informed consent. Physical examination, Blood biochemical tests, urine culture and ultrasound examination of the urinary system were done. Patients with prostate volume greater than 70cm³ were submitted to open transvesical prostatectomy and bilateral inguinal hernia repair. The hernias were identified by physical examination and ultrasonography was performed for all patients. A, suprapubic transverse incision (Pfannenstiel incision) was made, and the bladder exposed. Behind the rectus abdominis muscles, Retzius space was extended laterally as far as the iliopsoas fascia. At the lateral side of the anterior abdominal muscles on both sides, internal rings, inguinal canals, origin of inferior epigastric arteries, external iliac arteries, femoral canals, spermatic cords' elements and indirect hernia sac(s) were exposed (Fig. 1).

In patients with direct inguinal hernia, the site of hernia defect between the symphysis pubis and internal ring was determined and exposed and in patients with indirect inguinal hernias, the floor of the canal between symphysis pubis and internal ring was exposed and the elements of the spermatic cord were isolated from hernia sac. Then sac was driven into the abdomen (Fig. 2).

Two pieces of 10x14cm polypropylene meshes were prepared and incised longitudinally to the mid-part, and a circle was made at the center of the each mesh in order to cross the spermatic cord extent through it (Fig. 3).

The meshes were placed on the internal ring surrounding the spermatic cord and distended to cover both direct and indirect hernia defects. Then their inferolateral borders were fixed to the superior border of femoral canal, the inferomedial borders were fixed to posterior side of symphysis pubis, the superior borders were fixed to the medial aspect of anterior rectus sheath at two extreme points at the inferoposterior aspect of the incision line in each side. Then the bladder was opened longitudinally. After evaluating the ureteral orifices, the bladder neck was

circumferentially incised inferiorly and the prostate gland was enucleated. After haemeostasis, two way urethral Foley catheter No.22Fr was inserted and suprapubic drainage was made using a two way No.24 Fr Foley catheter. The bladder was sutured by 0 chromic in two layers in a watertight manner. Next a Foley catheter No.20 Fr was embedded perivesically as a drain. Layers were stitched anatomically. On the third post-operative day, the suprapubic drainage (cystostomy) catheter and drain were removed. If there was no evidence of surgical site infection, urine leakage and gross hematuria, the patient was discharged from hospital with the urethral catheter on the fourth day and on the seventh post-operative it was removed.

Postoperative complications were recorded and patients were followed for 10-19.5 months. Complications included hematoma and wound infection during the first month also chronic pain and recurrence during the follow up period. Chronic pain assessment was based on visual analogue scale (VAS). Results were collected and statistically analyzed using SPSS version 18.

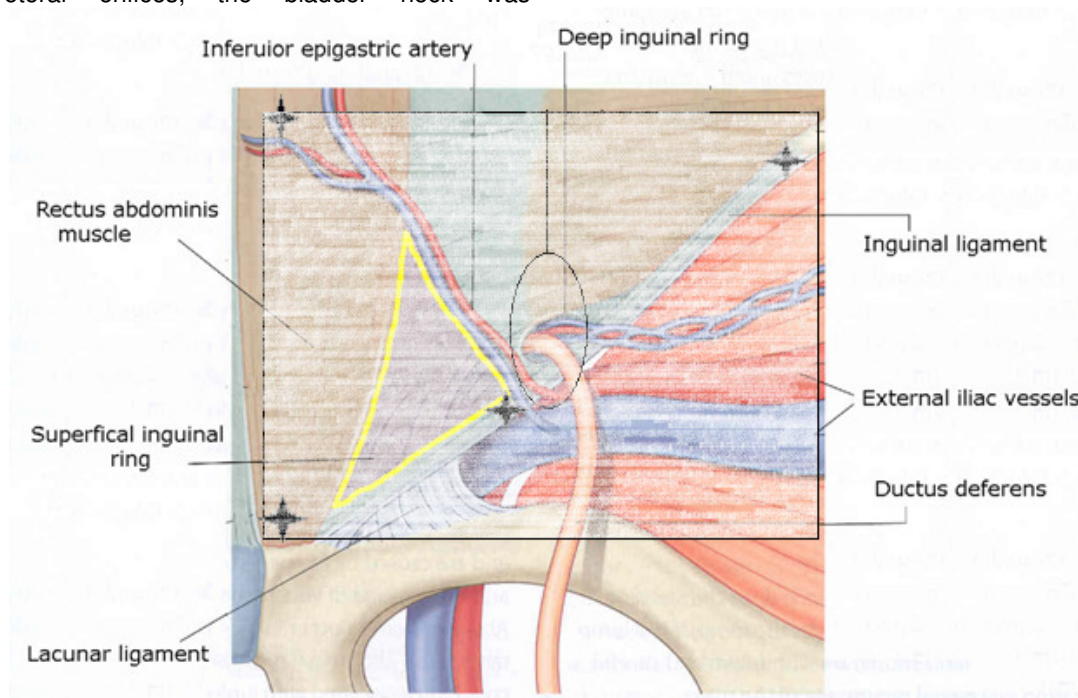


Fig. 1. Schematic view of inguinal canal with mesh placement (painting) and fixation (stars)

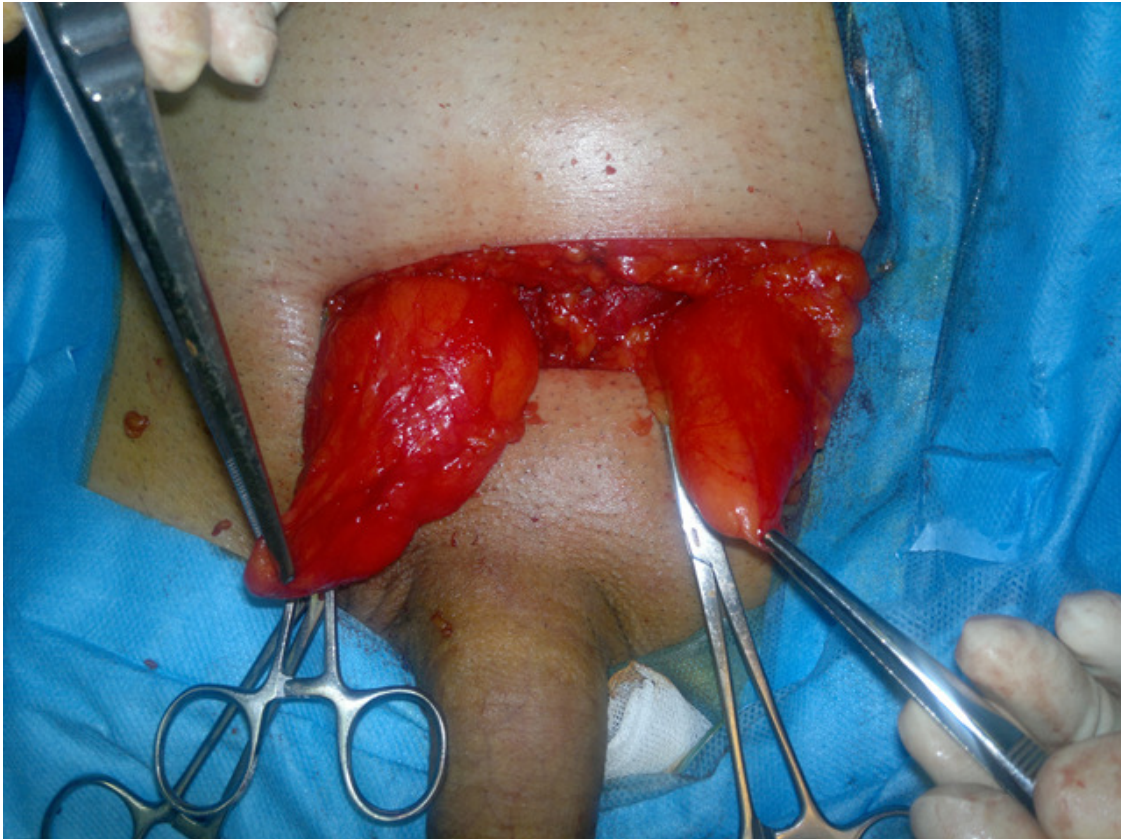


Fig. 2. Hernia sacs exposed in surgical field

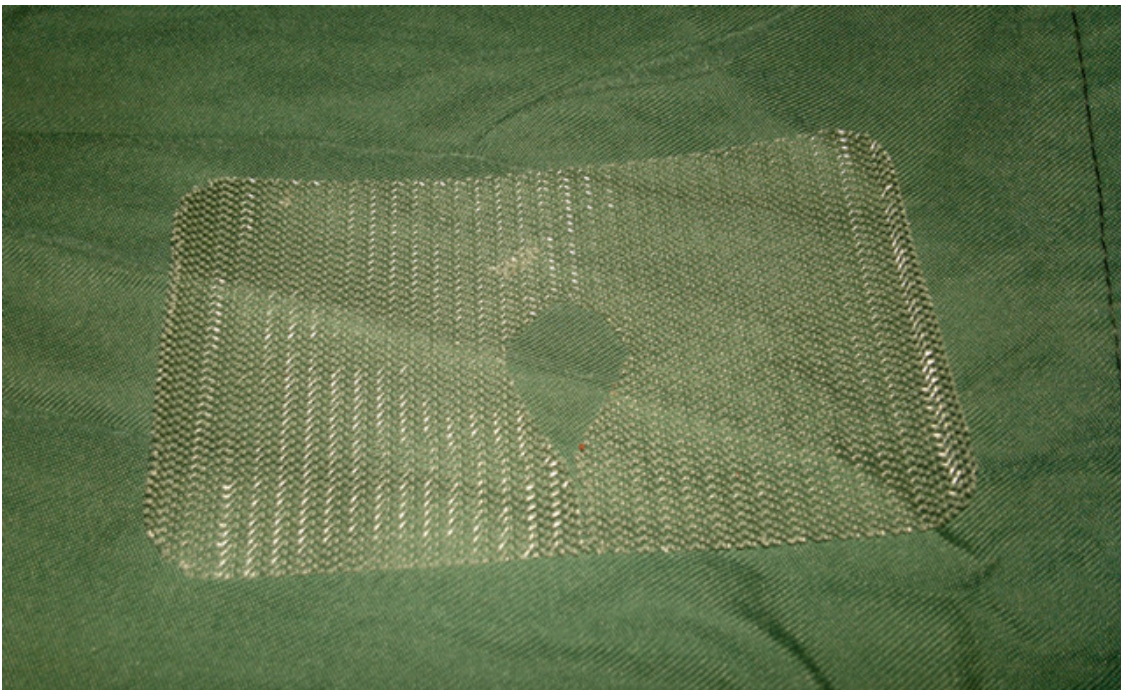


Fig. 3. Applied polypropylene mesh

3. RESULTS

In this study, 37 patients entered the study and were followed up after surgery. The mean age was 70.4 ± 7.10 years (range 55 to 87). Mean follow-up time was 13.7 months (range 10–19.5). 12 patients (32.4%) had bilateral direct inguinal hernia, 24 (64.9%) patients had bilateral indirect inguinal hernia and one patient (2.7%) had right side direct inguinal hernia and left side indirect inguinal hernia. Four patients (10.8%) had bilateral recurrent hernia and 2 others (5.4%) had recurrent hernia on one side and the other side had a primary hernia. Three patients also had concomitant bladder stones and one patient had bilateral hydrocele.

Mean operation time was 86 minutes (range 71–110 minutes). The mean blood loss during surgery was 578 (240–1250) milliliters and the mean decrease in hemoglobin level from before (13.7g/dl) to first post operation day (11.4g/dl) was 2.3g/dl. Mean prostate size was 85.2 ± 24.6 ml in preoperative ultrasonography. Average enucleated tissue was 68.7 ± 31.2 gm.

Surgical site infection and hematoma (as early complications), chronic pain and recurrence were not seen in any of the patients during the follow-up period. Mean VAS was 1.3; mild lymphocele formation was detected in one case (2.7%), which was conservatively managed. Average length of hospital stay was 4.10 ± 0.38 days.

4. DISCUSSION

In the early 19th century, it was believed that hernia was due to “mechanical disparity between visceral pressure and abdominal muscle strength” and “diminished abdominal wall strength due to defect, disability or aging”. Common factors that affect the development of hernia are: ascites, benign prostatic hyperplasia, constipation, cough, obesity, pregnancy, and heavy lifting. A simple explanation for the association of BPH and inguinal hernia is that patients with obstructive voiding symptoms strain to void. This strain over the time may have impact on the abdominal wall, resulting in the development of inguinal hernia. Another description for this association is that inguinal hernia and BPH are part of the aging process [2]. Inguinal hernia in patients undergoing prostate surgery was common and seen in about 15–25%.

Comprehensive evaluation increases the detection of inguinal hernias before prostatic

surgeries and simultaneous repair of these with prostatic surgery significantly decreases the risk of developing post-prostatectomy clinical hernias [11].

Baumert et al. [12] reported in their cases open transvesical prostatectomy operation time was 54 minutes. The average operative time of unilateral preperitoneal inguinal herniorrhaphy in Karatepe et al. [13] study was 44.56min. Mean operation time in this study was 86 minutes, which is less than separate operation times.

Mean total blood loss in transvesical open prostatectomy in Baumert’s study was 643ml [12]. The mean blood loss during surgery in our study was 578 milliliters and the mean decrease in hemoglobin level was 2.3g/dl. These results indicated that hemorrhage and blood loss in simultaneous surgery was rational.

In our previous study, we compared the results of simultaneous preperitoneal inguinal hernia repair with suturing, without mesh application and open prostatectomy in 83 patients with isolated inguinal herniorrhaphy in 54 patients in the period from 1998 to 2005. Early complications such as hematoma and wound infection were not seen in concomitant open prostatectomy and inguinal herniorrhaphy. In these patients four cases had recurrence of inguinal hernia (4.2%). However, in patients with inguinal herniorrhaphy, there was only one case of hematoma (1.5%) and also chronic inguinal pain (1.5%). Recurrence rate for inguinal hernia in these patients was 3% [3].

Kramer and colleagues performed simultaneous prostatectomy and inguinal herniorrhaphy on 18 patients in 1979. In their study, one case had wound infection (5.6%) and no recurrence was detected. Finally they conclude that simultaneous procedure had several advantages (less hospital stay, anesthesia frequency, surgical site infection and costs) in comparison with separate operations. Also this procedure was well tolerated by patients [14].

Savetski et al. performed simultaneous inguinal hernia repairs with open radical prostatectomy on 108 patients with prostate cancer. 75 patients had unilateral (69%) and 33 patients (31%) had bilateral inguinal hernia. Only one patient had postoperative complications (perineal discomfort, bilateral paresthesia) probably due to inguinal hernia repair. There was no surgical site infection in patients who underwent simultaneous hernia repair. Of these 141 inguinal hernias, at median

follow up of 16 months, four (2.8%) recurrences occurred [15].

Othman and Abdel-Maguid compared combined transurethral prostatectomy and inguinal herniorrhaphy in 15 patients with separate operations. Wound infection with delayed wound healing occurred in 1 patient (6.67%) in simultaneous operation group. Mesh infection and recurrence of hernia were not seen in both groups. They concluded that combined TURP and inguinal herniorrhaphy is a safe and effective surgical procedure with less hospitalization days and cost, anesthetic procedure, and convalescence [16].

Teber et al. [17] evaluated simultaneous laparoscopic mesh prosthetic herniorrhaphy during laparoscopic radical prostatectomy. Fifty laparoscopic mesh prosthetic herniorrhaphy procedures were done on 37 patients (13 bilateral and 24 unilateral inguinal hernias). In patients with simultaneous surgery mean operating time and the total amount of narcotic analgesic requirements were significantly higher than laparoscopic radical prostatectomy alone. There was no significant difference in the complication rate of two groups.

In another study, Krush et al. [18] performed simultaneous prostatectomy and herniorrhaphy on 34 patients during 1965 to 1973. They concluded that this procedure can be done without an increase in postoperative complications.

Wei et al. [19] performed a study on 21 patients with BPH who underwent simultaneous prostatectomy and inguinal herniorrhaphy. In four cases propylene mesh was applied. Two patients (9.5%) had recurrence; there were no other complications such as surgical site infection and pain.

In our study 37 patients with BPH and concomitant bilateral inguinal hernia underwent simultaneous surgery with pfannensteil incision. In this experience there were no complications such as hematoma, surgical site infection, chronic pain and hernia recurrence. The low complication rate of this study might be explained by the relatively low number of patients with bilateral inguinal hernia and concurrent BPH. However overall results were similar to previously mentioned studies.

5. CONCLUSION

In patients with BPH and inguinal hernia, simultaneous prostatectomy and preperitoneal herniorrhaphy with mesh application, is a convenient and safe procedure which can be performed easily by urologists. This procedure is efficient and achieves satisfying results that can reduce treatment costs, hospital stay and risk of anesthesia with better cosmetic results.

CONSENT

All authors declare that written informed consent was obtained from all patients for enrolling the study and publication of accompanying images.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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