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ORIGINAL ARTICLE

Small Transverse Scrotal Incision for Penile Prosthesis Implantation, Novel Technique

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Abstract

Background: ***Currently, penile prosthesis placement remains a third-line therapy for erectile dysfunction. Infection remains the most challenging complication among patients post-PPI.***

Aim of the work: ***Compare the validity and outcomes of the pure scrotal approach versus the classic penoscrotal incision for malleable PPI in our institute.***

Patients and methods: ***100 Participants candidates for malleable PPI were randomized after informed consent into two groups. Group (A) (n 50) underwent PPI through the scrotal approach, and group (B) (n 50) underwent the procedure through the Peno-scrotal approach. Both groups were studied for post-operative pain, wound healing, validity of the approach and post-operative complications.***

Results: ***We found a significant variance regarding pain duration, wound healing and regaining sexual activity between both groups in favour of group A (p-value < 0.001). Wound scarring in patients of group B was (100%) while no observed scar in group A (0%). There was a significantly higher incidence of post-operative penile oedema and wound dehiscence in group B compared to group A.***

Conclusion: ***The small transverse scrotal approach is a valid, straightforward approach for malleable PPI with a lower incidence of post-operative complications and satisfactory patient outcomes.***

Keywords: Scrotal incision; penile prosthesis; PPI complications

1. Introduction

Penile prosthesis implant (PPI) surgery is a practical management approach for several sexual dysfunctions, including medication-refractory erectile dysfunction (ED).[1]

PPI surgery has advanced dramatically in recent years. However, it still has certain dangers, both cosmetic and psychological, and might have unintended repercussions in patients who are not adequately screened and agreed upon. [2,3,4]

Advantages of the traditional penoscrotal approach over the infra pubic approach include avoiding dorsal nerve damage and increasing corporeal exposure, which are benefits of any ventral approach. The penis's dorsal sensory nerves are located on the side of the body away from the penoscrotal incision, keeping them safe from harm. With the Peno-scrotal technique, the dartos fascia is opened transversely. Then, the lower flap is dissected from the bulbous urethra and both crura, offering a good view of these structures.[5]

Patients with ED can be treated with small transverse pure scrotal incisions for PPI without using the traditional penile or penoscrotal approach.[6,7]

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With this transverse scrotal incision for malleable PPI, we expect to have the same previous advantages of the traditional penoscrotal technique in addition to a lower incidence of postoperative pain. This hypothesis is based on the lower sensitivity of scrotal skin and the possibility of tension-free, rapid wound closure and wound healing. The difference in embryologic origin of penile and scrotal skin has been suggested as a rationale for this hypothesis. The simplicity of this approach might provide a short learning curve even for junior urologists.

This research aimed to compare the outcomes of the pure scrotal approach versus the classic penoscrotal incision for malleable PPI in our institute.

2. Patients and methods

This was interventional randomized research done at Al-Hussein and Sayed Galal, Al-Azhar University Hospital in Cairo, Egypt, from September 2022 to November 2023. This study was conducted on 100 candidates for PPI and was randomized into two groups of 50 participants each. Group (A) underwent PPI through the transverse scrotal approach, and group (B) underwent the procedure through the standard penoscrotal approach.

Inclusion criteria: Male patients aged 18 years or older, diagnosed with ED and were candidates for (PPI) prepared to undergo malleable PPI.

Exclusion criteria: previous PPI or any other major penile surgery, active genitourinary infection and untreated bladder outlet obstruction.

Method: All patients were subjected to complete medical history fulfilment, including the International Index of Erectile Function 5 (IIEF5) and sexual satisfaction index (SSI) score; physical examination and laboratory investigations, including urine analysis and HbA1c, as well as penile duplex US.

Surgical Procedure of small transvers scrotal approach: Parenteral broad-spectrum antibiotic was given with induction of anaesthesia. Shaving of the genital area in the operation room and scrubbing for 10 minutes with chlorhexidine–alcohol preparations. Draping was done carefully to maintain sterilization. A sterile urethral catheter was inserted. As shown in Figure 1, a 2-cm curved scrotal incision was done horizontally, 2 cm posterior to the penoscrotal junction. Opening of the dartos fascia by electrocautery. Blunt dissection was carried out, and retraction of the incision was done distally to reach the sub-dartos space and expose Buck's fascia at the level of the mid-penile shaft. Dissection through each fascia layer was done, and each layer was lifted from the tunica albuginea. They placed two stay sutures in the tunica albuginea of each corpus to make a 2-cm longitudinal incision in between them into the corpus.

A fresh 15-blade scalpel is used to open the corpora. Scissors are used to improve the sub-tunical plane proximally and distally. Irrigation of corpora using normal saline mixed with gentamicin was done repeatedly throughout the procedure. Serial dilatation was done using Hegar dilators. Dilatation was done distally until the dilator fit well beneath the glans and proximally till it was held up at the ischial tuberosity. The prosthetic length was determined by measuring the length of the corpora using the implant sizer. Prosthesis insertion began at the proximal end. The tip was bent into a loop or circle to insert it into the distal corpora. The length fit should be checked. Removing the prosthesis and cutting off a further half a centimetre was done just in case it caused the corpus to curve. Adding suitable rear tip extenders was done if the glans hung down. Closure of the corpora utilizing 2-0 self-absorbable sutures (SAS). 4-0 S.A.S. used to close the subcutaneous tissues. Closure of skin with 4-0 SAS. Light compression dressing was done to be removed after 24 hours. The parenteral antibiotic was given for one week postoperatively.

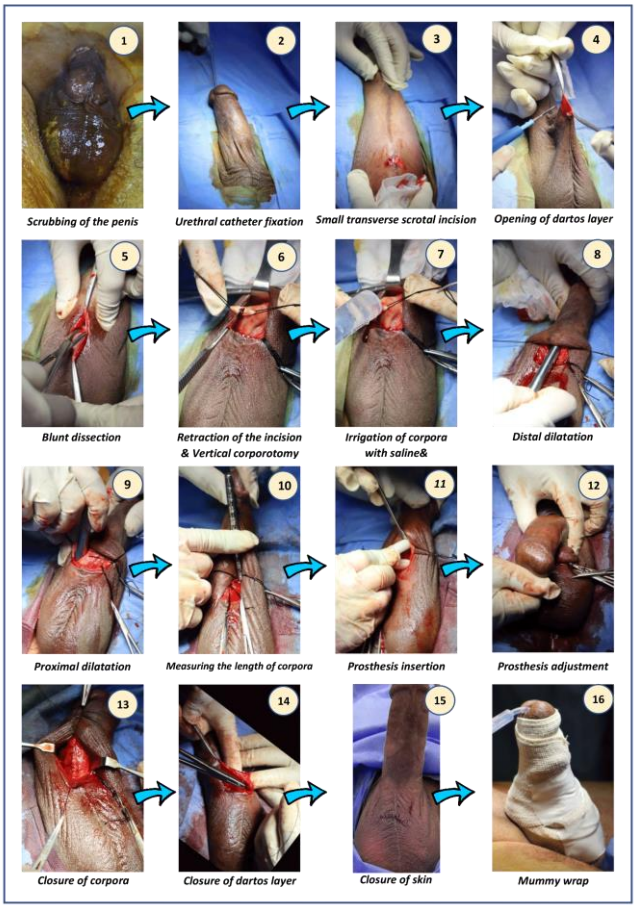

Figure 1. Steps of PPI through transverse scrotal approach.

Surgical Procedure of the traditional penoscrotal approach: The steps were done as previously mentioned in scrotal approach except the skin incision was done vertically or transversely at the penoscrotal junction.

Post-operative evaluation: The patients were discharged after 24 hours and the urethral catheter was removed as early as possible before discharge. Parenteral antibiotic was given for one week postoperatively. Regular wound dressing with careful weakly evaluation for 2 months for the following: post-operative pain severity using Numeric Pain Rating Scale (NPRS), pain duration, duration of wound healing, time for regaining sexual activity and cosmetic appearance after healing (visible scar or not). Post-operative complications were evaluated as delayed implant perforation, penile edema and wound dehiscence.

Ethical consideration: The research was thoroughly discussed with the patients prior to their participation in the trial. Before enrolling, the patients provided informed written permission. It was made clear that the cases had the freedom to leave the research at any time.

Statistical Analysis: For statistical analysis, Version 24 of the Statistical Package for Social Sciences (SPSS) was used. to express the qualitative data, percentage and frequency were utilized. Since the quantitative data were not normally distributed, the inter-quartile range (IQR) and median were presented

3. Results

All procedures were smooth and uneventful & the follow up data were summarized in tables. As shown in Table 1 we found no statistically significant difference amongst studied groups as regard age, pre-operative HbA1C level and DM.

Table 1. comparison of demographic data between studied groups.

		GROUP A (N = 50)	GROUP B (N = 50)	STAT. TEST	P-VALUE
AGE (YEARS)	Median	52.5	56	MW = 1048	0.164 S
	IQR	37 – 58.25	44.25 – 61.25		
DM	No	25 50%	25 50%	X^2 = 0.0	1.0 NS
	Yes	25 50%	25 50%		
HBA1C (%)	Median	6.3	5.9	MW = 1127.5	0.397 NS
	IQR	5.5 – 7.3	5.57 – 7.6		

MW: Mann Whitney U tests.

X2: Chi-square test. NS: p-value > 0.05 is considered non-significant.

Table 2. comparison of operative time between studied groups.

		GROUP A (N = 50)	GROUP B (N = 50)	STAT. TEST	P-VALUE
OPERATIVE TIME (MIN)	Median	60	60	MW = 1173	0.581 NS
	IQR	60 - 65	60 – 67		

As shown in Table 2 both procedures consumed nearly similar operative time with no statistically significant difference.

Table 3. Comparison of post-operative data between studied groups.

POST-OPERATIVE		GROUP A (N = 50)	GROUP B (N = 50)	STAT. TEST	P-VALUE
NUMERIC PAIN RATING SCALE (NPRS)	Mild	41 82%	16 32%	X^2 = 27.2	< 0.001 HS
	Moderate	9 18%	26 52%		
	Severe	0 0%	8 16%		
PAIN DURATION(DAYS)	Median	4.5	11	MW = 214.5	< 0.001 HS
	IQR	3 - 7	7 – 15		
WOUND HEALING(DAYS)	Median	14	21	MW = 173	< 0.001 HS
	IQR	10 – 15	15 – 30		
REGAINING SEXUAL ACTIVITY(DAYS)	Median	45	60	MW = 432	< 0.001 HS
	IQR	40 - 60	60 – 62.5		

When we compare post-operative data of both approaches, we detect statistically significant difference as regard pain score after 1 day, duration of pain, wound healing time and onset of regaining sexual activity in favor of group A as illustrated in Table 3.

Table 4. comparison of post-operative complications between studied groups.

	GROUP A (N = 50)		GROUP B (N = 50)		X^2	P-VALUE
Penile edema	3	6%	16	32%	10.9	0.001 S
Dehiscence	0	0%	6	12%	6.4	0.012 S
Visible scar	0	0%	50	100%	100	< 0.001 HS

Also, there were higher incidence of post-operative complications as penile edema, wound dehiscence and post-operative scarring in group B as detailed in Table 4.

Figure 2. Follow up case with penile prosthesis through scrotal approach with no scar and complete healing of the wound.

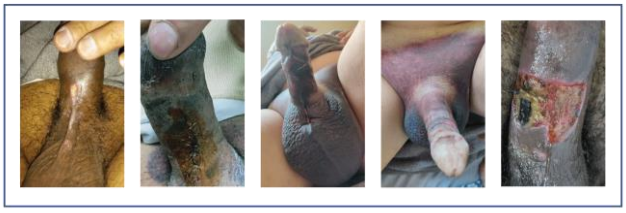

Figure 3. Follow up cases with penile prothesis through traditional penoscrotal approach with wound dehiscence, ecchymosis and ugly scars.

4. Discussion

Penile prostheses are subjected to continuous development and have gained better mechanical reliability and safety during the last decades.[8] However, complications of the prosthesis, together with the well-known complications of PPI, still can occur.[9]

This study was conducted on 100 candidates for PPI and was randomly divided into two groups of 50 participants each. Group (A) underwent PPI through the transvers scrotal approach, and group (B)underwent the procedure through the standard penoscrotal approach.

There was no statistically significant difference between the studied groups regarding age, pre-operative HbA1C level, and DM.

Our finding revealed that there was no statistically significant difference (p-value = 0.581) between the studied groups (group A and group B) as regards operative time, there was a highly statistically significant difference between the studied groups concerning NPRS with lower pain scores in group A (p-value< 0.001), there was statistically significant increase concerning pain duration, duration of wound healing and sexual activity regaining amongst patients of group B (P-value < 0.001), there was a significant increase in post-operative penile edema, wound dehiscence, and post-operative visible scar in group B (p-value 0.001, 0.012 and < 0.001 respectively) & none of study participants developed delayed cylinder perforation or forced to explant the prosthesis.

Our study used a malleable penile prosthesis, which has lower complication rates than an inflatable penile prosthesis. Regarding Kisa et al., [10], who wanted to compare complication rates between malleable (group 1) and inflatable (group 2) PPI using 131 cases, they found that malleable PPI was associated with lower complication rates compared to inflatable PPI, mainly because of mechanic failure.

According to Wilson et al., [11], a high scrotal transverse incision was popularized by Montague in the 1990s for inflatable PPI. It has advantages over the vertical penoscrotal or a transverse incision precisely on the junction of the penis and scrotum. Wound healing is better because there is no possibility of penile flexion stressing the incision, and access to the proximal corpora is more accessible.

In our results, we observed that the scrotal approach to wound healing has a better cosmetic appearance, with no visible scar. In addition, the duration of wound healing was shorter than that of the penoscrotal approach.

The percentage of penile edema and wound dehiscence is lower in the scrotal approach than in the penoscrotal approach. This confirms the finding of Marumo et al., [12], who reported a 32.4% incidence of penile edema in a group of 34 patients who underwent PPI through a subcoronal incision.

Our adoption of a no touch technique and good antibiotic prophylaxis regimen minimize the overall rate of complications, as reported by Pozza et al., [13]

Our scrotal approach is valid for both malleable and inflatable PPI.

Near results were obtained by Roth et al.,[14], who hoped to report on a modified procedure for a penoscrotal inflatable penile prosthesis (IPP) that would allow direct viewing of the reservoir implantation. They used a cohort of 157 cases, out of 165 total, who had IPP implantation and utilized a modified approach. The median age of their research participants was 66 years old (with a range of 30-83), and the standard deviation was 9.66 years.

In contrast to our results, Roth et al.,[14] demonstrated a higher mean operating time (72.8 minutes) than our results, owing to the use of an inflatable penile implant and the longer time needed to insert an IPP reservoir utilizing a direct vision technique.

In our research, we are the first to use the transverse scrotal incision for malleable PPI &

we found that the superiority of this scrotal approach over the penoscrotal approach for malleable PPI as it has the same advantages as the traditional penoscrotal approach as avoiding dorsal nerve injury and better corporeal exposure in addition to it has more advantages as lower incidence of postoperative pain owing to the lower sensitivity of scrotal skin and tension free wound closure, rapid wound closure and wound healing than traditional Peno-scrotal approach owing to the difference in embryologic origin of the penile and scrotal skin, less postoperative complications. It is valid for malleable and inflatable prosthesis implantation.

4. Conclusion

The small transverse scrotal approach is a valid, straightforward approach for malleable PPI with a lower incidence of postoperative complications and satisfactory patient outcomes. The cases that underwent PPI through the small transverse scrotal approach had superior outcomes than those that underwent PPI through the traditional penoscrotal approach.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

All authors have a substantial contribution to the article

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There are no conflicts of interest.

References

1. Carvalheira A, Santana R, Pereira NM. Why Are Men Satisfied or Dissatisfied with Penile Implants? A Mixed Method Study on Satisfaction with Penile Prosthesis Implantation. J Sex Med. 2015;12(12):2474-2480.
2. Colonnello E, Limoncin E, Ciocca G, et al. The Lost Penis Syndrome: A New Clinical Entity in Sexual Medicine. Sex Med Rev. 2022;10(1):113-129.
3. Cilio S, Pozzi E, Fallara G, et al. Premature ejaculation among men with erectile dysfunction-findings from a real-life cross-sectional study. Int J Impot Res. 2023;35(6):558-563.
4. Polchert M, Dick B, Raheem O. Narrative review of penile prosthetic implant technology and surgical results, including transgender patients. Transl Androl Urol. 2021;10(6):2629-2647.
5. MUNDY, Anthony R. and ANDRICH, Daniela E. Lower urinary tract. Oxford Textbook of Urological Surgery, 2017; 344.
6. Wang VM, Levine LA. Safety and Efficacy of Inflatable Penile Prostheses for the Treatment of Erectile Dysfunction: Evidence to Date. Med Devices (Auckl). 2022;15:27-36.
7. Dalkin BL, Wessells H, Cui H. A national survey of urinary and health related quality of life outcomes in men with an artificial urinary sphincter for post-radical prostatectomy incontinence. J Urol. 2003;169(1):237-239.
8. Bettocchi C, Palumbo F, Spilotros M, et al. Patient and partner satisfaction after AMS inflatable penile prosthesis implant. J Sex Med. 2010;7(1 Pt 1):304-309.
9. Sadeghi-Nejad H. Penile prosthesis surgery: a review of prosthetic devices and associated complications [published correction appears in J Sex Med. 2007 Sep;4(5):1520]. J Sex Med. 2007;4(2):296-309.
10. Kisa E, Keskin MZ, Yucel C, Ucar M, Yalbuzdag O, Ilbey YO. Comparison of penile prosthesis types' complications: A retrospective analysis of single center. Arch Ital Urol Androl. 2020;92(4): 10. 4081.
11. Wilson SK, Perito P, Park SSH, Mulcahy J. Unexpected nuances of the penoscrotal inflatable penile prosthesis. Int J Impot Res. 2022;34(5):416-423.
12. Marumo K, Tazaki H, Kaneko S, et al. Nihon Hinyokika Gakkai Zasshi. 1992;83(7):1071-1077.
13. Pozza D, Marcantonio A, Mosca A, Pozza C. Penile prosthesis and complications: Results from 577 implants. Arch Ital Urol Androl. 2020;92(4):10.4081/aiua.2020.4.302.
14. Roth JD, Monn MF, Shelton TM, Mellon MJ. A novel technique for direct visualization of reservoir placement for penoscrotal inflatable penile prostheses using a single incision. Indian J Urol. 2018;34(4):283-286.