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## Original Article

# Outcomes of surgical correction of Peyronie's disease with plaque excision and grafting: Comparison of testicular tunica vaginalis graft versus bovine pericardium graft



Ali Eslahi <sup>a,b</sup>, Faisal Ahmed <sup>c,\*</sup>, Mohammad Reza Askarpour <sup>a</sup>,  
Hossein-Ali Nikbakht <sup>d</sup>, Iman Shamohammadi <sup>a</sup>,  
Payam Ghasemi <sup>a</sup>, Hanieh Alimardani <sup>a</sup>, Bahareh Ebrahimi <sup>b</sup>

<sup>a</sup> Department of Urology, School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

<sup>b</sup> Shiraz Geriatric Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

<sup>c</sup> Urology Research Center, Al-Thora General Hospital, Department of Urology, School of Medicine, Ibb University of Medical Sciences, Ibb, Yemen

<sup>d</sup> Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

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## KEYWORDS

Peyronie's disease;  
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**Abstract** Objective: Peyronie's disease (PD) is an abnormal wound healing in the penile tunica albuginea. After fibrotic plaque excision, different graft materials have been used to repair the defects, but the optimal graft remains unknown. This study aimed to compare the functional outcomes of testicular tunica vaginalis grafts and bovine pericardium grafts in patients with severe PD.

**Methods:** A retrospective comparative study was conducted on 33 PD patients undergoing partial plaque excision and grafting from September 2015 to May 2021. The patients were divided into two groups depending on the type of graft used. For 15 patients in Group B, testicular tunica vaginalis grafts were used to repair the defect, while for 18 patients in Group A, bovine pericardium grafts were used. Data of the patient's age, comorbidities, sexual function, penile curvature, postoperative complications, need for further treatment, change in penile length, and satisfaction were gathered and compared between the groups. Sexual function was evaluated using the 5-item version of the International Index of Erectile Function (IIEF-5), and a

\* Corresponding author.

E-mail address: [fmaaa2006@yahoo.com](mailto:fmaaa2006@yahoo.com) (F. Ahmed).

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reduction in IIEF-5 after the surgery. Similarly, Chung et al. [26] noted a decrease of 5 points in the IIEF-5 scores after PD graft surgery. On the contrary, Ainayev et al. [20] reported a 2-point improvement in the IIEF-5 score within 2 years after the surgery (mean 18.4 [SD 2.5] to 20.6 [SD 2.60]). Likewise, Liu et al. [8] reported improvement in the IIEF-5 score with the follow-up from 12 months to 43 months. Differences between the studies in factors like case selection, surgeon experience, patient orientation, and level of education could explain these disparities in the IIEF-5 scores.

Long-term studies highlight the risks of decreased erectile function in response to the progression of arteriogenic or veno-occlusive dysfunction. For example, Kalsi et al. [27] reported a 22% decreased erectile function within 5 years of follow-up. Taylor and Levine [28] reported a 21% postoperative ED in the follow-up. Additionally, a recent literature review regarding plaque incisions and grafting showed that 4.6%–67.4% of patients required medicine to have erections postoperatively, and 0%–11.8% were utterly unable to achieve erections [29]. On the other hand, current studies suggested penile prosthesis implantation with or without additional straightening maneuvers for severe PD and concomitant ED [6,30].

In our study and within the follow-up period, there were 11 (33.3%) patients (5 vs. 6 patients in groups A and B, respectively) who used PDE5-Is to attempt penetrative sex. The need for PDE5-Is may not reflect ED as a result of the grafting procedure but may also be related to age-related changes occurring over the mean follow-up period [15].

Regarding satisfaction with the results, most patients and their partners were satisfied in both groups without a statistically significant difference (77.8% in pericardium graft vs. 86.7% in tunica vaginalis graft). The overall satisfaction is in accordance with a recent review by Ragheb et al. [5], which reported an overall satisfaction rate of 91.2% in pericardium grafted and 100.0% in tunica vaginalis grafted patients. Another multicenter study also described long-term outcomes for grafting 157 patients with the bovine pericardium, with a 97% satisfaction rate among patients within 2 years after surgery [31]. Case selection might be the key to our research's highly successful outcomes and satisfaction rates. Only those patients who met our criteria underwent surgery. Less strict exclusion criteria might lead to poorer outcomes which should be investigated in future studies. Additionally, we had an extended follow-up period compared to the previous studies, and having a single academic urologist during the follow-up visits helped us monitor and assess our patient's progress carefully while keeping patients motivated and involved in their treatments.

Despite including all PD patients who required graft surgery for 6 years between 2015 and 2021, the small number of cases in this study was our main limitation. We suggest further studies with a more extensive study population and better randomization.

## 5. Conclusion

Our results indicate that partial plaque excision and corporoplasty with testicular tunica vaginalis graft or bovine pericardium graft are equally effective treatments for men with clinically significant PD.

## Author contributions

Study concept and design: Ali Eslahi. Data acquisition: Payam Ghasemi, Hanieh Alimardani, Bahareh Ebrahimi. Data analysis: Hossein-Ali Nikbakht, Iman Shamohammadi. Drafting of the manuscript: Ali Eslahi, Faisal Ahmed. Critical revision of the manuscript: Faisal Ahmed, Mohammad Reza Askarpour.

## Conflicts of interest

The authors declare no conflict of interest.

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## References

- [1] El-Sakka AI, Salabas E, Din,cer M, Kadioglu A. The pathophysiology of Peyronie's disease. *Arab J Urol* 2013;11:272e7.
- [2] Ostrowski KA, Gannon JR, Walsh TJ. A review of the epidemiology and treatment of Peyronie's disease. *Res Rep Urol* 2016;8:61e70.
- [3] Chen R, McCraw C, Lewis R. Plication procedures, excisional and incisional corporoplasty and imbrication for Peyronie's disease. *Transl Androl Urol* 2016;5:318e33.
- [4] Fiorillo A, Droghetti M, Palmisano F, Bianchi L, Piazza P, Sadini P, et al. Long-term outcomes after plaque incision and grafting for Peyronie's disease: comparison of porcine dermal and bovine pericardium grafts. *Andrology* 2021;9:269e76.
- [5] Ragheb A, Eraky A, Osmonov D. A decade of grafting techniques as a sole treatment for Peyronie's disease. *Andrology* 2020;8:1651e9.
- [6] Chung E. Penile reconstructive surgery in Peyronie disease: challenges in restoring normal penis size, shape, and function. *World J Mens Health* 2020;38:1e8.
- [7] Fabiani A, Fioretti F, Pavia MP, Lepri L, Principi E, Servi L. Buccal mucosa graft in surgical management of Peyronie's disease: ultrasound features and clinical outcomes. *Arch Ital Urol Androl* 2021;93:107e10.
- [8] Liu B, Li Q, Cheng G, Song N, Gu M, Wang Z. Surgical treatment of Peyronie's disease with autologous tunica vaginalis of testis. *BMC Urol* 2016;16:1. <https://doi.org/10.1186/s12894-016-0120-3>.
- [9] Das S. Peyronie's disease: excision and autografting with tunica vaginalis. *J Urol* 1980;124:818e9.
- [10] Yuanyuan M, Ning S, Yang W, Xiaoming Y, Lijie Z, Ninghan F. Testicular tunica vaginalis patch grafting for the treatment of Peyronie's disease. *Cell Biochem Biophys* 2015;71:1117e21.
- [11] Rico L, Villasante N, Blas L, Bonnano N, Ameri C. Initial experience in the treatment of Peyronie's disease using testicular vaginal tunica graft. *J Clin Urol* 2021;5:1e7.
- [12] Choi JB, Lee DS. Efficacy of H-shaped incision with bovine pericardial graft in Peyronie's disease: a 1-year follow-up using penile Doppler ultrasonography. *Int J Impot Res* 2021; 33:541e7.
- [13] Hosseini J, Hosseini S, Hosseini MA, Rezaei Y. Pericardium in reconstructive urologic surgeries: a systematic review and meta-analysis. *Urol Int* 2019;102:131e44.