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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

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KEYWORDS
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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 versus 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, a bovine pericardium graft was 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-

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As for complications using a tunica vaginalis graft, Helal et al. [23] reported that 8.3% of cases present scrotal hematoma and glandular hypoesthesia after surgery. In the study by Rico et al. [11], scrotal hematoma, glandular hypoesthesia, orchialgia, and orchitis were reported in 17.3%, 56.5%, 8.3%, and 8.3%, respectively. The reported complication of bovine pericardium graft was cyst formation, graft contraction, infection, loss of sensation, and rarely urethral cutaneous fistula [12,19,24]. Conversely, in our study, the reported complications were hypoesthesia in three cases in each group, and infection, which was presented in one patient in the bovine pericardium group, was managed with medical therapy. As expected, since all surgeries in our study were carried out by a single academic urologist with many years of experience in this field, we had lower rates of complications in comparison to other researchers.

In our study, the difference between IIEF-5 scores in the pericardial graft and testicular tunica vaginalis groups was statistically insignificant. In contrast, the mean baseline IIEF-5 scores in both groups were slightly decreased, which was statistically insignificant ($p=0.49$). Reviewing previous literature, we found disparities in the reported IIEF-5 scores after the surgery. For instance, Flores and his team [25] reported a 6-point 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 points mean baseline increase in IIEF-5 score (mean: 18.4 [SD 2.5] to 20.6 [SD 2.60]) 2 years after the surgery. 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% post-operative 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 PDE5i to attempt penetrative sex. The need for PDEI5 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.
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Data analysis: Hossein-Ali Nikbakht, Iman Shamohammadi.
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Conflicts of interest

The author declares no conflict of interest.

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