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NERVE-SPARING RECONSTRUCTION OF AN EXTENSIVE TUNICAL DEFECT USING AUTOLOGOUS FASCIA LATA IN PEYRONIE'S DISEASE: A CASE STUDY

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ABSTRACT

Background: Peyronie's disease may result in severe penile deformity requiring surgical reconstruction of the tunica albuginea. In patients with extensive calcified plaques, plaque excision may result in a large tunical defect requiring grafting. The optimal graft material remains controversial.

Case presentation: We present the case of a 53-year-old man with Peyronie's disease, significant penile curvature, pain during erection, and an extensive calcified plaque measuring approximately 35 × 50 mm and involving approximately two-thirds of the penile circumference. Preoperative erectile function was assessed using the International Index of Erectile Function-5 (IIEF-5), with a score of 7 points. The patient underwent excision of the calcified plaque followed by reconstruction of the resulting tunical defect using an autologous fascia lata graft measuring 40 × 60 mm. The neurovascular bundle was carefully mobilised and preserved during the procedure.

Results: At 6 weeks after surgery, complete correction of the penile deformity and resolution of penile pain were achieved. The IIEF-5 score increased from 7 points preoperatively to 23 points postoperatively. No significant residual curvature or postoperative erectile dysfunction was reported at the time of follow-up.

Conclusion: Autologous fascia lata may represent a useful reconstructive option for extensive tunical defects following plaque excision in selected patients with Peyronie's disease. In this case, a nerve-sparing approach resulted in satisfactory early anatomical and functional outcomes. Further studies with longer follow-up are required to evaluate the durability and long-term functional outcomes of this technique.

KEYWORDS

Peyronie's Disease, Penile Curvature, Plaque Excision, Fascia Lata, Tunica Albuginea, Reconstructive Surgery

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1. Introduction

Peyronie's disease (PD) is an acquired disorder characterised by the development of fibrous plaques within the tunica albuginea, which may result in penile curvature, pain, shortening, and impaired sexual function. Surgical treatment is considered for patients with stable disease and a deformity that significantly interferes with sexual intercourse [1,2].

The choice of surgical technique depends on the severity and complexity of the deformity, penile length, and preoperative erectile function. Shortening procedures, including plication techniques, are generally considered in patients with adequate penile length and less complex curvature. In patients with severe curvature or complex deformities, plaque incision or excision followed by grafting may be considered [1,2].

Plaque incision and grafting (PIG) and plaque excision and grafting (PEG) allow reconstruction of the tunica albuginea following release or removal of the fibrotic plaque. A variety of graft materials have been described, including autologous venous grafts, fascia lata, buccal mucosa, and extracellular matrix-based materials [2–4]. Despite the availability of numerous graft materials, no single material has demonstrated clear superiority over the others [2,4].

Autologous venous grafts, fascia lata, buccal mucosa, tunica vaginalis, and various allogeneic and xenogeneic materials have been used for tunical reconstruction. The available studies are predominantly single-centre, retrospective, or based on relatively small patient populations, which limits direct comparison between individual graft materials [3,4].

Fascia lata has previously been described as a reconstructive material in Peyronie's disease. Kargi et al. reported the use of relaxation incision and fascia lata grafting for correction of penile curvature [5]. Kalsi et al. subsequently described plaque incision and fascia lata grafting using processed human fascia lata (Tutoplast) [6]. These studies demonstrated the feasibility of fascia lata-based reconstruction but differ from the present case because an autologous fascia lata graft harvested from the patient was used.

The present case describes nerve-sparing reconstruction of a large tunical defect following excision of an extensive calcified Peyronie's plaque using an autologous fascia lata graft. The aim is to describe the surgical technique and early anatomical and functional outcomes and to discuss this approach in the context of other currently available grafting techniques.

2. Methodology and Case Presentation

2.1. Case Presentation

A 53-year-old man was referred for evaluation of a penile lesion. He had an approximately 18-month history of Peyronie's disease. In the erect state, the patient presented with significant upward penile curvature exceeding 30°, accompanied by pronounced pain that had increased during the preceding three months. The deformity and pain interfered with sexual intercourse.

Physical examination revealed a firm, cartilage-like lesion located approximately 1 cm from the glans. The lesion measured approximately 35 × 50 mm, originated from the dorsal penile surface, and circumferentially involved approximately two-thirds of the penile circumference. Preoperative Doppler ultrasonography demonstrated preserved penile blood supply.

Erectile function was assessed using the International Index of Erectile Function-5 (IIEF-5), with a preoperative score of 7 points.

Following discussion of the available surgical options, the patient underwent surgical correction with excision of the calcified plaque and reconstruction of the resulting tunical defect using an autologous fascia lata graft.

2.2. Surgical Technique

The procedure was performed under spinal anaesthesia. A circumferential incision similar to that used for circumcision was made, followed by degloving of the penile skin and underlying tissues towards the penile root.

The deep fascia overlying the fibrous plaque was carefully dissected from the tunica albuginea while maximally preserving the neurovascular bundle. The neurovascular bundle was subsequently mobilised and gently retracted using soft tourniquets.

The calcified fibrous plaque was excised within the margins of macroscopically unchanged tunica albuginea. Following excision, a large tunical defect was identified.

The defect was reconstructed using an autologous fascia lata graft measuring 40 × 60 mm. The graft was initially secured around the circumference of the defect and subsequently sutured continuously to the tunica albuginea using 5-0 polydioxanone (PDS), incorporating the underlying cavernosal tissue. The central portion of the graft was additionally stabilised by fixation to the fibres of the penile septum.

Following completion of the reconstruction, pharmacologically induced artificial erection was performed to assess the integrity of the reconstruction and the final penile shape.

2.3. Follow-up Assessment

Postoperative assessment included evaluation of penile curvature, pain during sexual activity, erectile function, and postoperative complications. Erectile function was reassessed using the IIEF-5 questionnaire.

Written informed consent was obtained from the patient for publication of the case report and accompanying clinical images.

3. Results

The postoperative course was uncomplicated. At the 6-week follow-up visit, complete correction of the penile deformity was achieved. The patient reported complete resolution of penile pain during sexual activity and no significant residual curvature.

The IIEF-5 score increased from 7 points preoperatively to 23 points at 6 weeks after surgery, representing an improvement of 16 points.

No postoperative erectile dysfunction or significant sensory complications were reported during the available follow-up. Long-term follow-up was not available.

Table 1. Preoperative and postoperative clinical outcomes

Parameter	Preoperative	6-week follow-up
IIEF-5 score	7	23
Penile curvature	>30° upward curvature	Complete correction
Pain during sexual activity	Present	Resolved
Significant residual curvature	Present	Not reported
Erectile function	IIEF-5: 7	IIEF-5: 23
Sensory complications	—	None reported

IIEF-5, International Index of Erectile Function-5.

4. Discussion

Surgical management of Peyronie's disease remains challenging in patients with extensive plaques and severe or complex penile deformity. Plaque incision or excision followed by grafting allows reconstruction of the tunica albuginea while avoiding the additional penile shortening associated with tunical shortening procedures [1,2].

In the present case, the extensive calcified plaque involved approximately two-thirds of the penile circumference, and its excision resulted in a large tunical defect. A graft capable of covering the resulting defect was therefore required. Autologous fascia lata was selected because it provided a sufficiently large autologous tissue graft for reconstruction.

Several graft materials have been investigated for reconstruction following plaque incision or excision, including autologous saphenous vein, fascia lata, buccal mucosa, and extracellular matrix-based materials [3,4]. However, direct comparison between graft materials remains difficult because published studies differ in patient selection, severity and type of deformity, operative technique, graft dimensions, outcome measures, and duration of follow-up.

Fascia lata has previously been used for reconstruction in Peyronie's disease. Kargi et al. described relaxation incision followed by fascia lata grafting in 12 patients with penile curvature greater than 35° [5]. All patients achieved correction of curvature, and the authors reported satisfactory erectile outcomes during a mean follow-up of 10 months [5]. These findings support the feasibility of fascia lata as a reconstructive material.

Kalsi et al. subsequently evaluated plaque incision and grafting using processed human fascia lata (Tutoplast) in 14 patients [6]. The mean preoperative curvature was 67.2°, and the mean follow-up period was 31 months. Complete straightening was achieved in 11 of 14 patients. One patient developed de novo erectile dysfunction, while four patients reported penile shortening of more than 1 cm [6]. Importantly, the material used in that study was processed human fascia lata rather than autologous fascia lata harvested from the patient. Therefore, although both approaches involve fascia lata, the biological characteristics and surgical context are not identical.

Autologous venous grafting represents another established reconstructive option. Kalsi et al. reported the results of plaque incision and saphenous vein grafting in 113 patients [7]. Complete straightening was achieved in 86% of patients, while excellent or satisfactory outcomes were reported in 93%. However, postoperative erectile dysfunction occurred in 15% of previously potent patients, and penile shortening of more than 1 cm was reported in 25% of patients. Among patients followed for at least 5 years, erectile dysfunction and penile shortening were reported more frequently [7]. These findings demonstrate that effective correction of severe curvature can be achieved with venous grafting, although long-term functional complications remain relevant.

Buccal mucosa has also been investigated as an autologous reconstructive material. Ainayev et al. described plaque incision and buccal mucosa grafting in patients with stable Peyronie's disease and evaluated postoperative penile curvature, penile length, and erectile function [8]. Buccal mucosa represents a potential alternative autologous graft material; however, its use requires harvesting tissue from an additional operative site.

Extracellular matrix and collagen-based materials constitute another group of reconstructive materials. Fernández-Pascual et al. conducted a multicentre prospective study of collagen fleece TachoSil in patients undergoing plaque incision or excision and grafting [9]. The study demonstrated the feasibility of this approach and provided prospective multicentre data regarding anatomical and functional outcomes. TachoSil also offers the potential advantage of avoiding an additional donor site and has haemostatic properties [10].

A systematic review and meta-analysis by Natsos et al. highlighted the substantial heterogeneity of studies evaluating graft materials in Peyronie's surgery [4]. The authors concluded that no universal consensus exists regarding the optimal graft material. The limited number of comparative studies and methodological heterogeneity of the available literature make it difficult to establish superiority of one graft material over another [4].

Soydaş et al. compared autologous venous grafts with three types of extracellular matrix grafts in 115 patients undergoing surgery for Peyronie's disease [11]. Their study provides useful comparative information regarding different reconstructive materials. However, its retrospective design and the heterogeneity of the patient population limit the ability to establish a definitive superiority of one graft material.

Current European Association of Urology recommendations similarly do not identify a single graft material as universally superior. The choice of graft material for tunical lengthening procedures should take into account surgeon experience and patient preference, as available evidence does not demonstrate clear superiority of one material over another [2].

An important technical feature of the present procedure was preservation of the neurovascular bundle during mobilisation and reconstruction. Mobilisation of the neurovascular bundle may be required for correction of dorsal curvature but carries a potential risk of postoperative sensory disturbances [2,3]. In the present case, the neurovascular bundle was carefully mobilised and preserved. No postoperative sensory complication was reported during the available follow-up.

The improvement in erectile function observed in this case is also noteworthy. The preoperative IIEF-5 score was 7 points and increased to 23 points at 6 weeks after surgery, representing an increase of 16 points.

The patient had reported that his sexual difficulties were associated with pain and penile deformity. Nevertheless, the improvement in IIEF-5 should be interpreted cautiously. Because this is a single case with a short follow-up period, the observed improvement cannot establish a causal relationship between the reconstructive procedure and recovery of erectile function.

Recent long-term institutional data provide an important context for interpreting the present case. Sarna et al. reported a 15-year experience with plaque incision and grafting in 325 patients [12]. The study demonstrated high rates of postoperative satisfaction and return to penetrative intercourse but also identified postoperative complications including perceived penile shortening, hypoaesthesia, and de novo erectile dysfunction in patients with normal preoperative erectile function [12]. These findings emphasise the importance of long-term functional assessment following grafting procedures.

Table 2. Selected published grafting techniques for Peyronie's disease

Study	Graft material	Patients	Main reported outcomes	Important considerations
Kargi et al. [5]	Fascia lata	12	Correction of curvature in all patients	Early experience with fascia lata
Kalsi et al. [6]	Processed human fascia lata (Tutoplast)	14	Complete straightening in 11/14	De novo ED and penile shortening reported
Kalsi et al. [7]	Saphenous vein	113	Complete straightening in 86%	Long-term ED and shortening remain concerns
Ainayev et al. [8]	Buccal mucosa	—	Feasible reconstructive technique	Requires additional donor site
Fernández-Pascual et al. [9]	TachoSil	52	Prospective multicentre evaluation	No autologous donor-site morbidity
Soydaş et al. [11]	Venous and ECM grafts	115	Comparative retrospective data	No definitive graft superiority
Sarna et al. [12]	Various grafting procedures	325	15-year functional outcomes	Demonstrates importance of long-term follow-up
Present case	Autologous fascia lata	1	Complete early correction; IIEF-5 7→23	Large calcified plaque; nerve-sparing reconstruction

The present case differs from the previously published series in several respects. First, the patient had an extensive calcified plaque measuring approximately 35 × 50 mm and involving approximately two-thirds of the penile circumference. Excision therefore resulted in a substantial tunical defect requiring reconstruction with a relatively large graft. Second, the graft consisted of autologous fascia lata rather than processed human fascia lata, venous tissue, buccal mucosa, or extracellular matrix material. Third, particular emphasis was placed on preservation of the neurovascular bundle.

The size and extent of the plaque are clinically relevant because extensive plaque excision can result in a substantial tunical defect. In such circumstances, the reconstructive material must provide adequate coverage while allowing restoration of the penile contour. The autologous fascia lata graft used in this case measured 40 × 60 mm and was therefore capable of covering a large defect without reliance on an allogeneic or xenogeneic material.

Another relevant aspect is the absence of a reported postoperative deterioration in erectile function during early follow-up. The IIEF-5 increased from 7 to 23 points. However, the preoperative score indicates markedly impaired erectile function, and the patient reported pain and deformity as major contributors to sexual difficulties. The improvement may therefore reflect multiple factors, including correction of the deformity and resolution of pain. A single case cannot determine the mechanism of this improvement.

The main limitation of the present report is the single-case design and the short follow-up period of 6 weeks. Consequently, the durability of penile straightening, late penile shortening, recurrence of curvature, long-term erectile function, and delayed sensory complications cannot be assessed. In addition, the absence of a control group prevents direct comparison with other grafting techniques.

The present case should therefore not be interpreted as evidence of superiority of autologous fascia lata over other graft materials. Rather, it demonstrates the technical feasibility of using autologous fascia lata for reconstruction of a large tunical defect following excision of an extensive calcified plaque. Longer follow-up and larger comparative studies are required to determine whether this approach provides durable anatomical and functional benefits.

5. Conclusions

Autologous fascia lata may represent a useful reconstructive option for extensive tunical defects following plaque excision in selected patients with Peyronie's disease. In the present case, nerve-sparing reconstruction achieved complete early correction of penile deformity and resolution of pain, with improvement in the IIEF-5 score from 7 to 23 points at 6 weeks.

The available literature does not currently demonstrate clear superiority of any particular graft material. The present case should therefore be interpreted as evidence of technical feasibility and a favourable early outcome rather than evidence of superiority of autologous fascia lata.

Longer-term follow-up and comparative studies are required to evaluate the durability of correction, postoperative erectile function, penile length, sensory outcomes, and recurrence of penile deformity following reconstruction with autologous fascia lata.

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