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Surgical Management of Ossified Plaques in Complex Peyronie's Disease: Technical Tips and Tricks from a Challenging Case

Çağrı Doğan[1], Mehmet Fatih Şahin[1], Cenk Murat Yazıcı[1], Tahsin Turunç[2], Erdem Can Topkaç[1], Onur Akyıldız[1], Furkan Batuhan Tuncer[1]

[1]Tekirdağ Namık Kemal University Faculty of Medicine, Department of Urology, Tekirdağ, Türkiye
[2]Urocentre Urology Center, Department Urology, Adana, Türkiye

Abstract

This case report presents the surgical management of a patient with complex Peyronie's disease involving a densely ossified plaque. The report highlights technical tips and tricks used to overcome intraoperative challenges, including dissection strategies and grafting techniques. Our experience emphasizes the importance of surgical expertise in achieving successful outcomes in such demanding cases.

Keywords: Andrology, general urology, reconstructive urology

Introduction

Peyronie's disease (PD) is a urological condition characterized by the formation of fibrotic plaques in the tunica albuginea, resulting in penile deformity. The prevalence of PD in the general population ranges from 0.6% to 11% (1). Surgical intervention remains the gold standard for treatment. Surgical approaches include tunical shortening and lengthening techniques. According to the guidelines of the European Association of Urology and the European Society for Sexual Medicine, tunical lengthening procedures are recommended for complex cases of PD. These include severe penile curvature (>60 degrees), hinge deformity, hourglass deformity, and cases where the erect penile length is less than 13 cm (2-4). Based on current studies, the prevalence of complex PD is estimated to be approximately 10% among all PD cases (5). Techniques utilized in these cases include tunical incision or excision and penile prosthesis implantation combined with grafting. In a recent study based on the declaration by sexual medicine associations', it was stated that autologous or xenograft are often preferred in PD surgery (6). While saphenous vein and buccal mucosa, are most commonly preferred as autologous grafts, whereas small intestinal submucosa and bovine pericardium are preferred as xenografts (7).

Materials and Methods

To accurately evaluate penile deformity, all patients underwent an intracavernosal injection of 10 µg alprostadil followed by dynamic penile color Doppler ultrasonography, due to the limitations of preoperative self-photography (8). This protocol enabled standardized and objective evaluation of both erectile functional capacity and the degree of penile curvature. The patient's stretched penile length and girth were measured as 12.7 cm and 8.9 cm, respectively. The preoperative International Index of Erectile Function-5 (IIEF-5) score was found to be 21.

After routine skin cleaning in the supine position, the surgical site was covered with sterile drapes under aseptic conditions. A 16 Fr Foley catheter was inserted to achieve urethral catheterization. A circumferential skin incision was made along the previous circumcision line, and complete penile degloving was subsequently performed. An artificial erection was then induced by injecting saline through an angiocatheter inserted into the tunica albuginea. A dorsal curvature of approximately 70 degrees was observed at the penile base during artificial erection. Buck's fascia was carefully incised lateral to the urethra, and dissection was continued dorsally up to the 12 o'clock position to mobilize the neurovascular bundle (NVB). The NVB was subsequently suspended using vessel loops to ensure optimal exposure of the

Correspondence: Çağrı Doğan MD, Tekirdağ Namık Kemal University Faculty of Medicine, Department of Urology, Tekirdağ, Türkiye
E-mail: drcagridogan@gmail.com **ORCID-ID:** orcid.org/0000-0001-9681-2473
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underlying plaque. Initial attempts at Peyronie's plaque incision were made using a scalpel. However, all of these efforts were ineffective due to the dense calcification and firmness of the plaque. Further efforts, to incise the plaque using Adson-toothed forceps, were also ineffective. An additional attempt was made with monopolar cautery, but this, too, failed due to the plaque's extensive calcification. Subsequently, the anterior aspect of the calcified plaque was thinned using a scalpel, thereby allowing for a successful incision. Following the dorsal tunica albuginea incision, a 5×2 cm tunica albuginea defect was created using microsurgical scissors. The size of the tunica albuginea defect is calculated based on geometric principles. As described by Vicini et al. (9), the measurement is determined by assessing the length discrepancy between the convex and concave sides of the penile curvature. This defect extended dorsally from the midline toward both lateral aspects of the urethra. The bovine pericardium was preferred to fill the tunica albuginea defect. A graft approximately 20% larger than the actual defect size was employed to prevent postoperative graft contraction. The graft was sutured in the defect using a continuous 4-0 Vicryl suture technique. Due to the difficulty in re-establishing optimal rigidity following graft placement, a second artificial erection was not performed. The procedure was completed with anatomical closure of Buck's fascia, dartos fascia, and skin. A compressive dressing was applied and scheduled for removal after 48 hours (Video 1).

Results

No complications were observed during the perioperative and postoperative periods. The duration of postoperative follow-up was six months. In the first postoperative month, stretched penile length was recorded as 13.0 cm, penile girth as 9.1 cm, and the IIEF-5 score was 20.

Discussion

It may be preferable, particularly during mobilization of the NVB in the presence of a densely calcified plaque, to perform dissection not directly over the area of maximal calcification but rather from the distal or proximal penile segments where the plaque density is lower.

Conclusion

Surgical correction of complex PD involving ossified plaques can be particularly challenging due to dense calcification and limited plaque pliability. In such cases, a meticulous dissection strategy and individualized grafting technique are crucial for successful outcomes. These complex cases require considerable surgical experience and expertise and are best managed by surgeons with sufficient proficiency in advanced reconstructive techniques. Delaying such procedures until an appropriate level of surgical experience has been attained may contribute to improved outcomes and satisfaction for both the patient and the surgeon.

Video 1.

Ethics

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Ç.D., M.F.Ş., Concept: Ç.D., M.F.Ş., Design: Ç.D., C.M.Y., T.T., Data Collection or Processing: E.C.T., O.A., Analysis or Interpretation: M.F.Ş., F.B.T., Literature Search: C.M.Y., F.B.T., Writing: Ç.D., M.F.Ş., C.M.Y., T.T., E.C.T., O.A., F.B.T.

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