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# CORPOROPLASTY WITH SAPHENOUS VEIN GRAFT IN THE SURGICAL MANAGEMENT OF PEYRONIE'S DISEASE

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**Objectives** The aim of this study is to evaluate the use of the saphenous vein in grafting the tunica albuginea defect after excision/incision of Peyronie's plaque in cases of disabling penile deformity.

**Patients and Methods** A total of 12 patients with significant penile curvature due to Peyronie's disease interfering with their sexual activity were subjected to plaque excision/ incision and corporoplasty by saphenous vein patch grafting of the tunica albuginea.

**Results** Penile straightening was achieved in 9 patients. One patient had a minimal residual curvature with induration at the graft site which, however, did not interfere with his sexual activity. Two patients complained of less rigid erections and are currently responding to oral measures and ICI. Penile numbness occurred in four patients with dorsal plaques, and it was self limiting within six months. We encountered no complaint of penile shortening or impotence.

**Conclusion** The saphenous vein presents a reasonable alternative grafting material for the repair of tunica albuginea defects in patients with Peyronie's disease after plaque excision/incision. It is particularly useful in large plaque remnants and yields a satisfactory and appreciable outcome.

**Key Words** Peyronie's disease, tunica albuginea, corporoplasty

## INTRODUCTION

Peyronie's disease is an idiopathic disorder that affects the tunica albuginea of the penile corpus cavernosum. The true pathogenesis remains an enigma; however, it is believed that trauma to the penis incites inflammation resulting in fibrous plaque deposition within the tunica albuginea[1]. The disease is thought to have two phases: a) the acute inflammatory or active phase lasting between 12-18 months characterized by pain, curvature and nodule formation b) the chronic phase characterized by usually minimal pain and a stable nodule size but the presence of penile curvature that might necessitate treatment[2].

Though there is no established and effective medical treatment, a conservative approach is usually considered for the initial 12-18 months. Surgical treatment is offered to patients who report a loss of erectile function or severe curvature hindering sexual activity. Three surgical approaches are in common use: plication/wedge procedures[3,4], grafts with autologous tissue (dermis[5], tunica vaginalis[6], temporalis fascia[7], pericardial graft[8], veins[2,9,10]) or inert material[11] and prostheses with or without relaxing incisions[12,13].

In this work we evaluated the use of a saphenous vein graft for corporoplasty in 12 patients with disabling deformity secondary to Peyronie's disease.

## PATIENTS AND METHODS

A total of 12 patients with disabling penile curvature secondary to Peyronie's disease were selected for corporoplasty and saphenous vein grafting. These patients were not suitable for Nesbit's procedure or tunica albuginea plication as such procedures were anticipated to cause penile shortening. The patients' age ranged from 52 to 64 years (mean 57 years) with a duration of the disease ranging from 14 to 26 months. All patients reported rigid erections but had a penile curvature that hindered sexual engagement. Apart

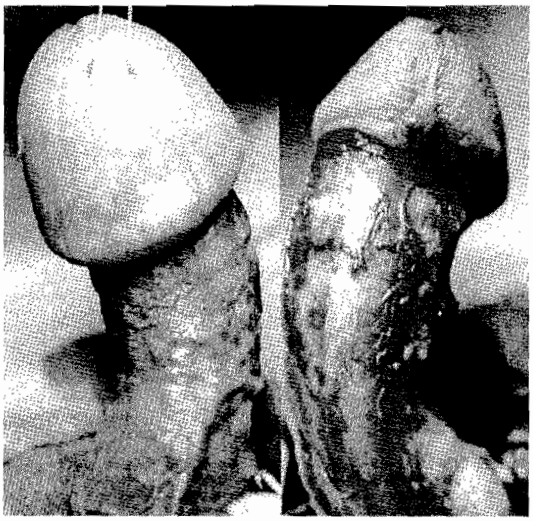

Fig. 1: Dorsolateral curvature and penile degloving

from intracavernous injection with prostaglandin $E_2$ ($PGE_2$) during examination, the patients were not evaluated for erectile adequacy. Patients complaining of difficulty in erection and weak responders to ICI with $PGE_2$ were excluded from the study. Preoperative evaluation included history taking (duration of the disease, penile rigidity, progression, sexual difficulty and penile trauma or surgery). Physical examination concentrated on the extent of the plaque, the degree of curvature (after ICI), measurement of the penile length long and short sides, an associated Dupuytren's contracture and the status of the lower saphenous vein. Informed consent was obtained emphasizing that surgery aimed at the correction of the deformity and the provision of a straight penis but not at improvement in the length of the penis or the quality of erections.

Technique:

Under general anaesthesia a circumferential incision was done followed by degloving of the penile skin and subcutaneous tissue to the base of the penis (Fig 1). Buck's fascia was entered just lateral to the urethra, and under surgical loop magnification (5x) a careful dissection of the neurovascular bundle from the dorsal plaques and of the urethra from the ventral plaques was carried out. In three patients with dorsal plaques, an extensive fixation of the dorsal bundle and a difficult localization of the vessels from the nerves warranted en masse dissection with part of the plaque adherent to it. After application of a tourniquet to

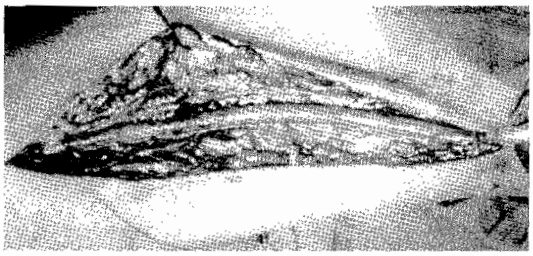

Fig. 2: Saphenous vein exposure

Fig. 3: Fashioning of the graft

the base of the penis, saline infusion was induced into the corpora through a 21 butterfly needle to localize the site of maximal curvature. The site of the plaque/s was marked, and with the use of a no. 11 scalpel blade and iris scissors the plaque was carefully excised to the underlying healthy soft cavernous tissue. Careful measurements of the defect were done with the penis stretched longitudinally and transversely to determine the size of the graft. The surgical field was covered until harvesting of the vein graft. Through a longitudinal incision over the medial aspect of the lower leg near the ankle, the saphenous vein was carefully exposed and isolated using the non-touch technique (Fig 2). The segment of the vein to be harvested was determined by the size of the tunical defect. The vein strip was opened, divided and sutured together with 6 zero polypropylene sutures to fit the size of the corpo-

real defect (Fig 3). The fashioned vein graft was sutured to the tunical defect with 5 zero polypropylene sutures with the endothelial lining facing inside. Artificial erections were induced to determine any residual curvature and points of leak. Plication stitches with 2-zero polypropylene sutures were used in order to correct any residual curvatures. The overlying layers of the penile fascia were closed, and a light pressure bandage was applied for 2 days. A urethral catheter was left for 48-72 hours.

## RESULTS

Nine patients had a single plaque, located dorsally in six and ventrally in three patients. Two patients had both dorsal and ventral plaques, and one patient had an hour-glass deformity. Ten patients had an angle of curvature less than 90 degrees while two patients had an angle of approximately 90 degrees. The size of the plaque ranged from 1-4 cm.

In nine patients the procedure yielded a perfect straightening of the penis, and they resumed full sexual activity within three months postoperatively. One patient had a residual curvature with induration at the graft site; however, it did not interfere with his sexual functioning. Two patients complained of a less rigid erection and are currently responding to oral medication. Penile numbness was encountered in four patients with dorsal plaques; it was self-limiting and resolved within six months. We had no complaints of penile shortening. One patient developed infection at the saphenous vein graft site which responded to antimicrobial therapy and local wound care.

## DISCUSSION

Peyronie's disease is a localized connective tissue disease resulting in fibrotic plaque formation in the tunica albuginea of the corpora cavernosa. Since its first description by François de la Peyronie in 1743 an exact aetiology has not been defined. The bulk of scientific literature attributes histological findings and symptoms to the effect of trauma[1]. The shape of the erect penis is determined by the fully expanded corpora cavernosa within the tunica albuginea. Patients with Peyronie's disease present a spectrum of deformity, dysfunction and erectile deficit[7]. Medical measures in the form of vitamin E, potaba, colchicine, tamoxifen[14] and intralesional injection therapy with verapamil[15], steroids[16], collagenase and interferon[17] have all been tried with limited success. Nevertheless, conservative treatment is always considered in disease of recent onset, minimal deformity and recent onset of plaque progression.

Surgery for Peyronie's disease is reserved only for patients with failed conservative treatment, stabilized disease, persistent pain, curvature and indentation and erectile deficit. Three surgical approaches are in common use: plication/wedge procedures[18], grafting with autologous tissue (dermis[5], tunica vaginalis[6], temporalis fascia[7], vein graft[10]) or inert material[11] and prosthetic implantation with or without relaxing incisions[12,13]. Lue et al. recommended the plication procedure in potent patients or impotent patients with good response to oral treatment or ICI and in patients with an adequate penile length. Incision and grafting are recommended in potent patients with a short penis or hour-glass deformity, while prosthetic implants are to be offered only to impotent patients[9].

Nesbit's technique of tunica plication has been used with a high success rate in the management of curvature, but it inevitably results in penile shortening[3]. Yachia described a modification by a longitudinal incision and transverse closure[19]. Plication procedures have helped in illustrating that the correction of penile deformities due to tunica albuginea compliance pathology can succeed, if the configuration of the tunica at maximal extension is changed[20].

Various autologous and inert patch grafts have been used as substitutes for corporoplasty after plaque excision or incision. Ideally, a patch graft material should be available that is biocompatible, easily harvested, strong and large enough to cover sizable defects[21]. The superiority of autologous grafts has been elucidated as it is believed that prosthetic material excites the formation of a capsule around it that contracts and defeats straightening goals. The temporalis fascia has been tried successfully as a patch graft[7]. It is thin with unobstructive fit into the flaccid tunica, it also exhibits high tensile strength and low metabolic requirements; however, urologists may consider the donor site and material difficult based on the need of plastic and neck surgeons for harvesting. The dermis is more vascular with higher metabolic demands which together with the random fiber arrangement contribute to its

contracture when used as a free graft[22,23]. Furthermore, replacement of the defect with a dermal segment decreases tension of the tunica wall adjacent to the graft hindering normal veno-occlusion with a higher incidence of venogenic impotence[24]. The tunica vaginalis is readily available, easily harvested and can bridge sizable defects; however, it lacks strength and may develop aneurysmal dilatation[25]. Cadaveric pericardium has been tried as a graft material with appreciable results[8] offering the advantage of the absence of a second surgical incision and the ease of surgical placement; however, only a small number of patients have undergone this surgery. The venous patch graft has been introduced to add to the armamentarium of tunical substitutes[21,26-28]. The use of a venous graft for corporoplasty allows endothelial healing, thus limiting dissection and at the same time remaining pliable and supple. The venous segment with an intact endothelium can release nitric oxide which has many physiological effects (platelet effect, neurotransmission and cytotoxicity) thus preventing haematoma formation and minimizing fibrosis under the graft[2]. The vein patch has an underlying moderate fibrosis and no evidence of obliteration of the corpus cavernosum as seen with the preputial pedicle flap and no signs of localized vascular thrombosis as seen with silicone grafts[21]. Reformation of the tunica over the vein patch site indicates a partial resorption of the patch that acts as a scaffold or template for reformation of the overlying tunica albuginea. Additional advantages include the ease of harvesting, fashioning to fit sizable defects and availability[2].

In our work we achieved perfect straightening of the penis in 11 patients (91.6%); two of them complained of less rigid erections and one responded to oral therapy and ICI. Potency was achieved in 10 patients; one of them had a residual curvature that did not interfere with his sexual activity. We encountered no major complications in our series, and we had no reports of penile shortening or total impotence.

We agree with Lue[9] that a review of the literature indicates that inclusion criteria for graft surgery in Peyronie's disease are unclear and differ from study to study with no consensus on a unique procedure to suit most patients. Our study has shown, however, that the venous graft is a reasonable substitute for corporoplasty with highly encouraging results.

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## RESUME

**Plastie des Corps Caverneux Utilisant un Greffon de la Veine Saphène dans la Prise en Charge de la Maladie de Lapeyronie.**

**Objectifs:** Le but de cette étude est d'évaluer l'utilisation de la veine saphène pour une plastie de l'albuginée du corps caverneux après excision/incision d'une plaque de Lapeyronie dans le cas de déformation pénienne invalidante. **Patients et méthodes** : Un total de 12 patients présentant une incurvation significative de verge due à la maladie de Lapeyronie gênant l'activité sexuelle ont bénéficié d'une excision/incision et d'une plastie de corps caverneux utilisant un patch de greffon prélevé au niveau de la veine saphène sur l'albuginée des corps caverneux. **Résultats**: Le redressement de la verge a été réalisé chez 9 patients. Un patient présentait une coudure résiduelle minime avec induration au niveau du greffon sans que cela ne compromette l'activité sexuelle. Deux patients se plaignaient de défaut de rigidité à l'érection et répondent bien actuellement au traitement oral et aux injections intra caverneuses. Un engourdissement pénien a été noté chez 4 patients ayant une plaque, mais ce désagrément avait spontanément régressé au bout de 6 semaines. Nous n'avons pas rencontré de raccourcissement de verge ni de dysfonction érectile. **Conclusion**: La veine saphène présente une alternative intéressante comme greffon dans la réparation du défect de l'albuginée du corps caverneux chez les patients présentant la maladie de Lapeyronie et ayant bénéficié d'une excision/incision de la plaque. Elle est particulièrement intéressante dans le cas de grosses plaques avec des résultats appréciables et satisfaisants.

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