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EDITORIAL

Reconstructive surgery in Peyronie's disease: What's new?

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Abstract

Surgical treatment of Peyronie's disease (PD) is still a challenge and a gold standard approach does not exist; however the main goal is to straight penile shaft, and to restore penetrative and coital capacity. The less invasive approach aims to correct curvature without intervening directly on the fibrous plaque while the more complex "corporoplasty" applies specific geometric criteria and uses different autologous and heterologous grafts. Each approach has its pros and cons and decision-making should be tailored to the individual patient's expectations. Other surgical options include different use of patches to cover the tunica albuginea defect, with the choice depending on the surgeon's personal experience. Despite the wide range of autologous (buccal mucosa, vein, dermis, *etc.*) and heterologous grafts (bovine pericardium, swine intestinal submucosa, porcine dermis, *etc.*) none currently represents the real "gold standard" because the data are extremely variable and frequently not representative. Several factors seem to favor buccal mucosa grafts over inert biocompatible materials: as vital tissue, buccal mucosa tends to heal rapidly, immediately integrating with the surrounding albuginea tissue. This translates into a more rapid resumption of spontaneous erections (after 3/4 d) and sexual activity and into a reduced risk of curvature relapse and erectile dysfunction after surgery. Another advantage of the buccal mucosa graft is its low cost. In conclusion, despite the recent development of some exciting new surgical techniques we are still unable to deliver a definitive take-home message about reconstructive surgery in PD because the majority of the studies reported insufficient data. However, since it is clear that major outcomes, besides the cosmetic result, are the patient's and partner's satisfaction and the economic impact of each technique, we recommend they be included among the outcome assessment parameters in further studies

Key words: Reconstructive urology; Peyronie's disease; Corporoplasty

Core tip: Surgical treatment of Peyronie's disease is still a challenge and a "gold standard" approach does not exist. This paper tries to review the main surgical techniques making an assessment of functional and aesthetical results, underling costs and benefits.

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INTRODUCTION

Even though Peyronie's disease (PD) may affect 1% to 23% of men between 40 and 70 years of age its real incidence could be under-estimated because of men' s embarrassment and health care providers' limited reporting[1]. Treatment of PD is still a challenge and a gold standard approach does not exist. Basically, when conservative therapies fail, the only option is surgery, which is usually reserved for patients with stabilized chronic disease. Surgical treatment avails of two main approaches to achieve its principal objectives of straightening the penile shaft, and restoring penetrative and coital capacity[2,3]. The less invasive approach aims at correcting curvature without intervening directly on the fibrous plaque while the more complex corporoplasty applies specific geometric criteria and uses different autologous and heterologous grafts[4]. Each approach has its pros and cons and decision-making should be tailored to the individual patient's expectations.

Many surgeons avoid plaque surgery by performing techniques like the Nesbit[5] or Yachia[6] in elderly patients with their associated risk factors and in patients with a sufficiently long penis and no more than 30°/40° curvature. These approaches act prevalently on the convex side of the curvature to counterbalance the lines of force caused by plaque fibrosis. Cosmetic results are good but not completely satisfactory because penile shaft shortening, the extent of which depends on the pre-existing degree of curvature, often creates notable psychological problems for patients.

An alternative option is fibrous plaque incision which aims at reducing traction but cannot restore length and girth to the penis[7-9]. Consequently, to achieve the best cosmetic and functional results, simple incision has evolved to include application of "geometric" principles (Austoni *et al*[7] and Egydio *et al*[8,9] and Zucchi *et al*[10]).

The complex Egydio technique requires a series of measurements that enable the surgeon to perform a single, relaxing incision and prepare the graft, which is a collagenous matrix of bovine pericardium, precisely. It restores penile length and girth with good functional results and sexual satisfaction[8,9,11].

The simpler Austoni technique is reserved for PD patients with curvature and a slight erectile dysfunction (ED). A special silicone axial support (Virilis I ®) is implanted to help extend the shaft and identify with extreme precision the point of maximum penile curvature, thus facilitating corporoplasty and preventing scarring and graft retraction[7,10].

Rolle *et al*[12] recently described a new lengthening procedure to resolve severe shortening of the penis due to PD in 3 cases. It is based on a ventro-dorsal incision of the tunica albuginea, penile prosthesis implantation, and double dorsal-ventral patch grafting with porcine small intestinal submucosa. The average increase in length was 3.2 cm and all patients resumed sexual intercourse with satisfaction, no significant loss of sensitivity or any sign of vascular distress in the glans. Since the technique was carried out in such a limited number of cases, the results need to be confirmed by larger prospective studies[12].

Another innovative approach links the geometrical principles of the Egydio technique with a circular tunica albuginea incision at the point of maximum curvature in order to achieve maximum restoration of the original penile girth and length. Inflatable two- or three-piece or malleable penile prostheses are implanted and pericardium grafts are used to cover the defects. In cases of severe penile shortening and narrowing this extensive penile shaft reconstruction is highly effective, as it achieves maximum penile length gain and girth restoration, regardless of plaque characteristics[13].

Other surgical options include corporoplasty and the use of a patch to cover the tunica albuginea defect, with the choice depending on the surgeon's personal experience. Autologous grafts include buccal mucosa, saphenous vein and derma while the most commonly used materials for the heterologous patch are the pericardium, the Swine Intestinal Submucosa (SIS) and the porcine dermis. Since these materials tend to mimic the tunica albuginea scarring, which could cause graft retraction and surgical failure, is prevented as much as possible[14-16]. Despite the wide range of autologous and heterologous grafts, none currently represents the real "gold standard"[14,15] because the data are extremely variable and frequently not representative.

A recent review by Levine *et al*[14] assessed 37 of the major case studies reported in the literature. It included corporoplasty with plaque incision and grafting, and demonstrated that biocompatible materials do not provide better outcomes in terms of satisfaction or postoperative ED than autologous grafts or buccal mucosa. Many studies did not include complete information. In 4 studies which used SIS (227 patients), only one reported a 79% satisfaction rate and globally ED ranged from 9% to 45%[17-20]. In 7 studies which implanted a pericardial graft (136 patients), only 3 reported the satisfaction rate (74% to 92%) with ED varying from 0%-30%[21-27]. Outcomes are comparable in the buccal mucosa graft series with ED in 0-3% of the cases and a 85%-100% satisfaction rate[16,28].

Since corporoplasty with buccal mucosa provides such promising results it is worth focusing on how it is performed[16]. The mouth is prepared using 0.4% chlorhexidine solution and the largest possible free buccal mucosa graft is harvested from the cheek; the wound is sutured using a continuous 2-0 Vicryl rapid suture. Under general anesthesia penile degloving is followed by an hydraulic erection. Buck's fascia is bilaterally incised, close to the urethra to isolate the neuro-vascular bundles or the urethra, according to plaque location. After a double Y-shaped plaque incision at the site of maximal curvature the penis is manually stretched to carefully dissect the underlying

cavernous tissue by the tunica and to measure the size of the gap that the buccal mucosa graft has to cover. Because of buccal mucosa's intrinsic property of great elasticity, the graft does not require oversizing. It is stretched over a table for "defatting", placed with its submucosal surface on cavernous tissue and sutured to the tunica margins with reabsorbable sutures (Vicryl 3/0). Penile straightening and length are tested in a hydraulic erection. If correction of the primary curvature is incomplete a contralateral albuginea plication may be needed.

Several factors seem to favor buccal mucosa grafts over inert biocompatible materials. The latter need an integration time of 4 to 6 wk to reconstitute scar tissue which is surely more "abundant" and "reactive" than after implants made of a living tissue, such as buccal mucosa which, thanks to its elevated binding capacity and revascularization, is immediately supplied with blood from the cavernous tissue. As vital tissue, buccal mucosa tends to heal rapidly, immediately integrating with the surrounding albuginea tissue. This translates into a more rapid resumption of spontaneous erections and sexual activity and into a reduced risk of curvature relapse and ED after surgery[28]. Another advantage of the buccal mucosa graft is its low cost. The average cost of most bio-compatible materials that are usually implanted in Europe ranges 500-1000 euros, to which the cost of buying or hiring a vacuum device must be added as patients require rehabilitation to prevent scarring-related retraction. Consequently, the total costs rise to about 1500/2000 euro per patient. When the buccal mucosa graft is used, the patients do not need a vacuum device, as spontaneous erections return 2/3 d after surgery.

In conclusion, despite the recent development of some exciting new surgical techniques we are still unable to deliver a definitive take-home message about reconstructive surgery in Peyronie's Disease because the majority of the studies reported insufficient data. However, since it is clear that major outcomes, besides the cosmetic result, are the patient's and partner's satisfaction, we recommend they be included among the outcome assessment parameters in further studies. Last but not least a look at the economic impact of each technique would not go amiss in the era of spending reviews on health care.

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