

Results of Dermal Patch Graft in the Treatment of Peyronie's Disease

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ABSTRACT

Purpose: To investigate the efficacy of "dermal patch graft" in surgical management of Peyronie's.

Materials and Methods: eighteen of Peyronie's disease cases, with a mean age of 49 and a history of penile curvature and painful erection were enrolled in this study. Diagnosis was made clinically by plaque palpation. All of them were in the chronic stage of disease with symptom duration of at least 6 months. We also evaluate their potency through Brief Sexual Function Inventory (BSFI) questionnaire before and after the operation, meanwhile the degree of penile curvature was measured with goniometry while artificial erection status was induced.

Results: Mean penile curvature, before and after the operation (58 and 5 degrees respectively), showed significant improvement ($p < 0.001$). The improvement of curvature was irrespective of the plaque size. All of our patients suffered from inability to intercourse due to significant penile curvature but after the procedure 11 of them (66.1%) could do so. Also the BSFI score improved significantly in this subgroup ($p < 0.05$). The remaining 7 cases (39%) already suffered from erectile dysfunction despite of operation; however, the penile curvature improved significantly in them. Six of this latter group had a plaque size greater than 4 cm² and BSFI score was not significantly improved.

Conclusion: Dermal patch graft as a cost effective method in the management of Peyronie's disease significantly corrects the curvature irrespective of plaque size and curvature severity. We found that if the fibrous plaque is less than 4 cm² and the patient has no severe erectile dysfunction, this procedure will significantly improve his potency; however, if the patient suffers from a plaque sized greater than 4 cm² and/or severe erectile dysfunction, to reach satisfactory erection, implantation of penile prosthesis or applying other methods of artificial erection in addition to dermal patch graft is suggested.

KEY WORDS: Peyronie's disease, dermal graft, penile curvature

Introduction

Peyronie's disease was first described by Francois De-La Peyronie in 1743.⁽¹⁾ This disease causes penile curvature by forming fibrous plaque on penile tunica albuginea.⁽²⁾ According to the most recent studies, its prevalence is approximately 3% and most of the patients are 40 to 60 years old. Despite of the introduction of the disease about 250 years ago and its high prevalence, not

only the etiology and mechanism of Peyronie's disease is unknown, but also there is no approved available standard therapy.⁽³⁾ However, a few theories have been proposed to explain the pathogenesis:

Microtraumas during intercourse (the most accepted theory),⁽⁴⁾

Vascular inflammation and its resultant fibrous,⁽⁵⁾

Genetic factors such as HLA-DQ5.⁽⁶⁾

Peyronie's disease has two clinical phases: acute phase with painful erection, inflammation, and deformity of the penis, and chronic phase in which the pain reduces and persistent penile curvature, plaque calcification, and erectile dysfunction is established. Diagnosis is made by history and physical examination. A palpable plaque on tunica albuginea, curvature, and painful erection are characteristic for this disease.

The treatment of choice in the acute phase is conservative therapy using oral antioxidants (vitamin E, Potaba),^(7,8) Colchicine, intralesional injection of drugs (Verapamil, steroids, collagenase)^(9,10,11), and any type of energy transmitters (ultrasound, extracorporeal shockwave therapy, laser therapy, x-ray).^(3,7,12) Appropriate response to medical therapies in this phase is of low probability and surgical intervention is warranted.

To the present time several surgical approaches have been suggested, often based on the incision or removal of plaque accompanied with plication or grafting of dermis, tunica vaginalis, venous wall, Dacron, pericardium, or fascia to the plaque region.⁽¹³⁾

After 30 years of the innovation of dermal patch grafting method, it has remained one of the best approaches due to low complication, cost-effective material used, availability, and maintaining the length of penis. Nonetheless, dermal patch graft has not been used in our center before this study and its outcome and indications are not well defined. Moreover, to the authors' knowledge, no study has been done to investigate the relation of surgical response and the size of fibrous plaque. Thus, our study is a unique one to re-evaluate a known surgical procedure and suggests useful notes for treatment decisions.

Materials and Methods

Dermal patch graft surgery was performed in 18 males, referred to Shaheed Faghihi and Motahhari Urology clinics between 1999 and 2002. The mean age of the patients was 49 ± 4.45 (range 41 to 60) years. In all of the patients, it had been 6 months since the beginning of the symptoms and they were all in the chronic phase. They had received one to three types of medications with no significant response. Penile curvature had been established according to the patients' report and the presence of plaque was confirmed by the urologist examination. No additional paraclinic assessment was required for diagnosis. Primary evaluations consisted of disease history taking, filling out a

Brief Sexual Function Inventory (BSFI) questionnaire, determining the location and size of the plaque, and measuring the degree of penile curvature. Erection was induced using Papaverin with a minimum dosage of 10 mg, increased gradually to achieve complete erection. Afterwards, the degree of deviation was measured using goniometry.

BSFI questionnaire had three main parts of frequency of erection, hardness of erection, and overall satisfaction. Each part had 0 to 4 scores, making BSFI sum together.⁽¹⁴⁾ Kelami classification⁽¹⁵⁾ was used for grouping the patients according to the plaque size. This classification method (Kelami's) is a standard method to classify penile curvatures:

- Class I: Plaque size $< 2 \text{ cm}^2$
- Class II: Plaque size $2-4 \text{ cm}^2$
- Class III: Plaque size $< 4 \text{ cm}^2$

The operation included the stages of tunica albuginea dissection with sparing posterior neurovascular bundle of the penis, plaque removal, and dermal patch grafting. The dermal patch was obtained from the superior region of iliac crest skin, after separating the epidermis and subcutaneous adipose layer.

The outcomes were recorded 3 and 6 months after the surgery using BSFI and deviation measurement of the artificially erected penis. Finally, data analysis was done by Wilcoxon signed ranks test and paired t test with the help of SPSS 10 software.

Results

None of the 18 patients was able to have intercourse due to penile curvature or erectile dysfunction preoperatively. Penile curvature trend was dorsal in 61%, lateral in 28% and ventral in 11%. Mean penile curvature degree was 58 ± 19 (range 25 to 90) degrees. Deviation decreased to 5 ± 6 (range 0 to 20) degrees postoperatively which was significant ($p=0.0005$).

Peyronie's plaque was in the median one-third of the penis in 50%, distal one-third in 28%, and proximal one-third in 22%. Mean plaque volume was 3.3 ± 2.1 (range 1 to 9) cm^2 .

According to Kelami classification, 28% (5) of the patients were in class I (plaque size $< 2 \text{ cm}^2$), 38% (7) in class II ($2-4 \text{ cm}^2$), and 33% (6) in class III ($> 4 \text{ cm}^2$). Mean BSFI score was 4.4 ± 1.7 , which improved to 7.3 ± 1.4 after the procedure. This significant improvement was also seen in each part of BSFI questionnaire ($p=0.01$).

Analysis of the results of 6 cases with a plaque

size of greater than 4 cm (Kelami class III) revealed that postoperative BSFI cumulative score and the ones for each part did not differ significantly ($p=0.5$).

However, changes in the degree of penile curvature was statistically significant ($p=0.0005$). In patients with a plaque volume of greater than 4 cm³, surgery was only effective in the correction of penile curvature.

None of the patients had satisfactory intercourse before the operation, but the overall complete or moderate satisfaction was achieved in 61% (11 patients) postoperatively. Six out of 7 patients, who were impotent postoperatively, had a plaque size of greater than 4 cm². Preoperative painful erection (40%), declined to 11% (2 patients) following the surgical therapy.

As a complication, two cases of superficial ecchymosis were seen, which were improved spontaneously.

Discussion

Devin and Horton were the first who described plaque excision and dermal patch graft with successful results in 1974.⁽¹⁶⁾ Since then various materials were used as a graft such as tunica vaginalis and venous wall.

Artificial materials were also introduced such as Dacron and Polyglycolic acid.^(11,17,18,19)

Every method had its own limitation, for example, venous wall could be used only in small plaques. Furthermore, synthetic materials did not result in desirable outcomes because of the lack of flexibility and being foreign body.⁽²⁰⁾

As well as the access to a natural low cost material, using derma has the advantage of no plaque size limitation and no risk of hypersensitivity reaction.

In this study all the patients were in the fifth or sixth decade of life and had an average age of 49 years which is comparable to the epidemiologic data of the disease in most parts the world.⁽²¹⁾

Spontaneous improvement or response to medical therapy is probable in the acute phase. Thus, surgical intervention must be performed at least 6 months after the beginning of the symptoms or in case of complete calcification of the plaque.⁽²²⁾ As we considered this condition, the chance of recovery without invasive intervention was trivial. BSFI questionnaire was preferred because of its flexibility and simplicity in comparison with other questionnaires such as IIEF (International Index of Erectile Function) that is complicated with much

more items.⁽²³⁾ Although the range of deviation was wide (25° to 90°) surgery was effective in lowering the penile curvature; mean degree of the angle declined from 58° to 5° which was a significant change ($p=0.0005$). Plaque size did not affect the correction of penile deviation. Consequently, results are indicative of the benefits of using dermal graft in the correction of severe deviations despite of the large size of plaque. Conversely, other methods like plication have not been effective in severe deviation and have led to shortening of penis.⁽²⁴⁾

None of the patients had been able to have effective intercourse preoperatively, but 61% had satisfactory results proved by the significant rise of BSFI and its components scores ($p=0.01$). Reassessment of the remaining 7 patients, who still were complaining of erectile dysfunction and unsatisfactory intercourse, revealed that 6 of them had plaques size greater than 4 cm² and their chief complaint had been inability to achieve erection before the operation. In this group of patients BSFI changes were not significant either ($p=0.5$).

Regarding these findings, it seems that this approach is not effective in the treatment of sexual dysfunction when the plaque size is greater than 4 cm² (Kelami Class III) or when severe erectile dysfunction is present before the operation. Plaque excision and using dermal patch graft can only correct penile deviation in these cases. However, further studies are needed to confirm our findings.

Accordingly, it is suggested that these patients become aware of the risk of failure and be proposed to use prosthesis, drugs, or devices of erection induction.

Conclusion

Dermal grafting is a cost-effective and useful method for penile curvature correction regardless of the severity of the curvature or the plaque size. The results of this study indicate that this method is successful if the plaque size is less than 4 cm² and erectile dysfunction is not severe. Thus, it is recommended to use prosthesis or artificial erection methods as well as the operation in patients with a larger volume of plaque and complete impotence. Since Peyronie's disease leads to severe physical and psychological complications and due to its prevalence, further studies are warranted.

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