



Inflatable penile prosthesis with plaque incision and grafting with TachoSil for Peyronie's disease (PICS Technique)

Georgios Hatzichristodoulou

Department of Urology and Pediatric Urology, Julius-Maximilians-University of Würzburg, Würzburg, Germany

Correspondence to: Georgios Hatzichristodoulou, MD, FEBU, FECSM. Associate Professor of Urology, Department of Urology and Pediatric Urology, Julius-Maximilians-University of Würzburg, Oberdürrbacher Str. 6, 97080 Würzburg, Germany. Email: hatzichris_g@ukw.de.

Background: Residual curvature correction during inflatable penile prosthesis (IPP) implantation in patients with Peyronie's disease (PD) is common. The PICS Technique, that is plaque incision and grafting with the self-adhesive TachoSil® (Baxter, CA, USA), is a novel option to address residual curvature in these cases. In order to understand the surgical technique and improve surgical outcomes the urologist should follow a standardized approach. The aim of this study is to provide tips and tricks for the PICS Technique.

Methods: The present study offers a step-by-step tutorial for the PICS Technique. The author describes his surgical technique in detail and provides important aspects and tips one has to be aware of when performing the PICS Technique. Surgical videos will highlight the most important steps during the approach. Indications to perform this technique will also be presented. Moreover, postoperative management strategies will be discussed.

Results: The PICS Technique can be applied when residual curvature is $>40^\circ$ after insertion of the IPP. Important steps include penile degloving, opening of Buck's fascia and mobilization of the neurovascular bundle. The device is then inflated, and plaque incision is performed at the point of maximum curvature. The defect of the tunica albuginea is then closed/sealed with the TachoSil®, which does not require suture fixation. Finally, Buck's fascia and the penile skin are closed. Postoperatively, the device is left inflated 40–50% for a period of 4 weeks. Sexual intercourse is possible 6 weeks following the surgical procedure. Close follow-up is recommended in order to detect possible complications/problems.

Conclusions: The present study offers a step-by-step tutorial for the PICS technique, in order to help the reader to understand major steps during the procedure and to avoid pitfalls. The surgical videos help visualization of crucial surgical steps. A standardized approach and adequate postoperative management are main predictors for success and patient satisfaction.

Keywords: Inflatable penile prosthesis (IPP); residual penile curvature; Peyronie's disease (PD); PICS Technique; TachoSil

Received: 03 March 2019; Accepted: 26 June 2019; published: 19 July 2019.

doi: 10.21037/jovs.2019.06.04

View this article at: <http://dx.doi.org/10.21037/jovs.2019.06.04>

Introduction

Inflatable penile prosthesis (IPP) implantation in patients with Peyronie's disease (PD) is indicated when there is co-existing erectile dysfunction (ED) that does not respond to medical/conservative treatment (1,2). After implantation of the IPP residual curvature may be present in these cases, requiring further procedures to straighten the penis. Residual curvature during IPP implantation can

be addressed by the Modeling maneuver, plication or by plaque incision and grafting. There are several autologous and non-autologous grafts that can be used to close the tunical defect after plaque incision in these cases (2-4). The novel surgical sealing patch TachoSil® (Baxter, CA, USA) has emerged as a very promising and reliable graft in PD grafting surgery. Recently, the PICS Technique (Penile Implant in Combination with the Sealing Technique) has

Table 1 Summary of crucial surgical steps during the PICS Technique

| |
|--|
| After insertion of cylinders inflate maximally |
| If residual curvature is $>40^\circ$ perform the PICS Technique |
| Deflate implant and proceed with penile degloving |
| Open Buck's fascia and mobilize neurovascular bundle at area of maximum curvature |
| Inflate device maximally |
| Perform transverse plaque incision at point of maximum curvature (concave side of curvature), use electrocautery with 20 Watts |
| Penis will be stretched and straight |
| Close tunical defect with TachoSil, overlap defect at least 5–10 mm |
| Close Buck's fascia and penile skin |
| Leave implant inflated partially (70% for 3 days) |

been introduced, using the TachoSil[®] to close/seal the tunical defect after plaque incision for residual curvature correction during IPP placement.

The aim of this study is to provide a step-by-step tutorial on the PICS Technique. As this is a novel technique, it can be challenging, especially in inexperienced hands. As such, this paper also provides tips and tricks from an experienced surgeon in the field. The videos within this article will highlight the most important surgical steps and will help the reader to visualize the procedure in detail. Moreover, indications for the approach and postoperative management will be discussed.

Methods

This study provides recommendations regarding pre- and post-operative considerations regarding the PICS Technique from an experienced surgeon in PD reconstructive surgery. The videos included in this article will highlight key surgical steps during the procedure. This will help the reader to understand the surgical technique in detail. One major focus is to provide a detailed step-by-step surgical tutorial for the PICS Technique, as performed on a daily basis by the author. This includes recommendations on preferred devices, sutures, and dressings. Preparation and handling of the TachoSil[®] as graft are a major step during the PICS Technique. Special attention will be paid on this issue. Also, the technique of plaque incision with the penile implant in place will be presented in detail, in order to avoid damage to the device. Furthermore, this article

includes recommendations for adequate postoperative management of patients undergoing this technique.

Results

Preoperative considerations, patient selection, and counseling

Patients with PD who also display severe ED that is not responding to medical/conservative therapy do have an indication for implanting an IPP. Realistic expectations must be set, as it is crucial that the PD patient understands that there are surgical limitations, such as penile length restoration, even with plaque incision and grafting. PD leads to penile shortening in most patients. This is irreversible in most of the patients affected. Thus, the aim of the PICS Technique is to restore erectile function and to achieve penile straightening in order for the patient to be able to engage in satisfying sexual intercourse. Preoperative counseling with a fully documented, signed consent by patients who are willing to undergo the PICS Technique is imperative. In this regard, it should be mentioned that the decision to perform the PICS Technique is often made intraoperatively, since the extent of residual curvature (if present) will be visible after insertion of the penile implant. The patient should also be asked if he experienced any penile curvature because of his PD, at a previous time point when he still had adequate erections. This could help planning the surgical approach.

Surgical technique

In the following section, the PICS Technique will be described in detail, providing a step-by-step tutorial (5,6). Crucial steps of the technique are listed in *Table 1*.

Surgery starts with routine implantation of a 3-piece IPP via the peno-scrotal access. In patients with PD, it is recommended to use Coloplast Titan cylinders, as these are more rigid than others. If the PICS Technique is performed, it is advisable and important to oversize the cylinders 1 cm. This is important because plaque incision will lead to penile stretching/lengthening of approx. 1 cm.

After implantation of the cylinders and the reservoir, the system is filled and connected, and the device is inflated maximally. If residual curvature is present and measured $>40^\circ$, the PICS Technique is performed. The pump and a drain are placed into the scrotum and the scrotal wound is closed in order to reduce the risk of infection. Then, a



Figure 1 Inflation of device and check for residual curvature, opening of Buck's fascia and mobilization of neurovascular bundle, with the device in place (7).

Available online: <http://www.asvide.com/article/view/32884>



Figure 2 Plaque incision at point of maximum curvature, with the device inflated (8).

Available online: <http://www.asvide.com/article/view/32885>

circumcising skin incision followed by penile degloving is performed. The device is again inflated to check for the extent of residual curvature and for the point of maximum curvature. At the area of maximum curvature, Buck's fascia is opened, beginning next to the urethra on both sides. This is done after deflation of the device. One should keep in mind that the implant is in place during this step. Then, the neurovascular bundle is mobilized and held with a vessel-loop (*Figure 1*).

In the next step, the device is again inflated maximally. At the point of maximum curvature on the dorsal aspect of the penis (concave side of curvature), plaque incision is performed in a transverse direction. This is done using electrocautery (coagulation) with maximum energy level of 20 Watts, which is sufficient for incising the plaque of

the tunica albuginea. After complete incision of the tunica albuginea, the device cylinders will be visible. There is no risk of damaging the device as long as electrocautery is used during this step (no cold knife!). The transverse dorsal incision is then extended laterally in order to further stretch the penile shaft and provide total penile straightening. In order to release the tension at the plaque area, it is important to incise all the longitudinal fibres of the tunica albuginea. At the end of this step, the final defect of the tunica albuginea will be visible (*Figure 2*).

Surgery continues with closure/sealing of the tunical defect with the TachoSil®. The TachoSil® is moistened with physiological saline and put on the defect. It is of utmost importance that the TachoSil® overlaps the edges of the defect on all sides of at least 5–10 mm, in order to adhere to the tunica albuginea and to provide a water-tight closure. The size of the TachoSil® used is 4.8 cm × 4.8 cm, which is sufficient for most defects. If necessary, a second TachoSil® can be used, which can overlap the first one. The TachoSil® is manually moulded over the defect and the tunica albuginea for approx. 3 minutes. After this time period a sufficient and water-tight closure is achieved. Importantly, suture fixation is not needed as the TachoSil® has self-adhesive properties, because it becomes like a tissue sealant when it gets in contact with saline (*Figure 3*). Thus, there is absolutely no risk of device damage, compared to other grafts that have to be sewn into the tunical defect. Once the tunical defect is sealed, the neurovascular bundle is reapproximated and Buck's fascia is closed with a running Monocryl® 4-0 suture (Ethicon, Somerville, NJ, USA) on both sides. Then the device is inflated again maximally to check for the end-result of penile straightening (*Figure 3*). At the end of surgery, the penile skin is closed using interrupted Monocryl® 4-0 sutures.

The device is left 70% inflated for 3 days following surgery. A loosely mummy wrap is put around the scrotum and the penis and left for 1 day. The drain in the scrotum should be removed also on postoperative day 1.

Postoperative considerations and management

On postoperative day 3, the implant is deflated a bit, and again left inflated 40–50% for 4 weeks. The TachoSil® acts like a scaffold allowing for tunical regeneration. Thus, the penis should be kept under stretch to allow for adequate straightening. After 4 weeks, the patient is advised to inflate the device for 1 hour daily. These are very important steps during the postoperative period. Sexual intercourse should



Figure 3 Closure/sealing of tunical defect with TachoSil, closure of Buck's fascia, and check for end-result of straightening (9). Available online: <http://www.asvide.com/article/view/32886>

start no earlier than 6 weeks after the surgical procedure.

Discussion

The PICS Technique represents a novel approach for residual curvature correction during IPP implantation in patients with PD and severe ED not responding to medical therapy. The major advantage of using the TachoSil® as graft to close the tunical defect after plaque incision, is that it does not need suture fixation. Therefore, there is no risk of device puncture. Moreover, this is a time-saving approach, leading also to decreased risk of infection.

There are some crucial steps during the surgical procedure that need to be paid attention. This paper helps the reader to understand important key steps during the PICS Technique, in order to allow for maximum success. Moreover, the present paper summarizes important pre-, intra-, and postoperative recommendations. The videos accompanied with this paper highlight the most important steps of this novel technique. The most important points associated with the PICS Technique will be highlighted and summarized in the following section.

First, oversizing the cylinders 1cm during the implantation of the device is important. This is because plaque incision will lead to penile stretching/lengthening of penile size of approx. 1 cm. Thus, it is important to oversize the cylinders in order to avoid hypermobile glans or other deformities related to short implant cylinders.

Moreover, it is sufficient to mobilize the neurovascular bundle only at the area of the point of maximum curvature. It is not necessary to mobilize this completely from the base to the tip of the penis. One major issue is plaque incision

after elevation of the neurovascular bundle. It is important to use electrocautery, as incising the tunica albuginea with a cold knife would lead to risk of device damage. Moreover, in order to release the complete tension at the plaque area, it is important to incise the complete tunica and to also extend the incision laterally on both sides. The result of penile straightening will be visible immediately.

Another important aspect is defect closure of the tunica albuginea following plaque incision with the TachoSil®, as this represents a fast approach. However, some key points should be respected. The TachoSil® should overlap the edges of the defect on all sides of at least 5–10 mm. This is crucial as the TachoSil® has to adhere to normal tunica albuginea in order to provide a sufficient closure and a water-tight sealing. After defect closure, the neurovascular bundle has to be reapproximated and Buck's fascia is closed in order to further support the defect closure provided by the TachoSil®.

Postoperatively, the device should be left inflated 70% for 3 days, followed by partial inflation of about 40% for the next 4 weeks. This is important in order to keep the penis under stretch and to allow for adequate healing of the tunical defect, and consequently adequate permanent penile straightening.

Conclusions

The PICS Technique has emerged as a novel and very promising surgical technique in Peyronie's surgery when penile prosthesis is indicated and when residual curvature correction is needed. The TachoSil® does not need suture fixation. Therefore, there is no risk of device puncture. Moreover, this technique is a time-saving approach. The PICS Technique can be applied to patients who display residual curvature of $>40^\circ$ after IPP implantation. Because of the plaque incision and the following stretching of the penile shaft, penile length can be maintained or even increased with this approach. The videos included in the present paper highlight the most important surgical steps of the PICS Technique, which will be of great help to urologists around the world willing to adopt this novel technique.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the Guest Editors (Martin Gross, Jay Simhan and Faysal

A. Yafi) for the series “Penile Prosthesis Surgery” published in *Journal of Visualized Surgery*. The article has undergone external peer review.

Conflicts of Interest: The author has completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/jovs.2019.06.04>). The series “Penile Prosthesis Surgery” was commissioned by the editorial office without any funding or sponsorship. The author has no other conflicts of interest to declare.

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The author stated no ethics committee available for this study. Written informed consent was obtained from all patients.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Chung E, Ralph D, Kagioglu A, et al. Evidence-based management guidelines on Peyronie’s disease. *J Sex Med* 2016;13:905-23.
2. Hatzichristodoulou G, Osmonov D, Kübler H, et al. Contemporary Review of Grafting Techniques for the Surgical Treatment of Peyronie’s Disease. *Sex Med Rev* 2017;5:544-52.
3. Garcia-Gomez B, Ralph D, Levine L, et al. Grafts for Peyronie’s disease: a comprehensive review. *Andrology* 2018;6:117-26.
4. Hatzichristodoulou G. Grafting techniques for Peyronie’s disease. *Transl Androl Urol* 2016;5:334-41.
5. Hatzichristodoulou G. The PICS Technique: A Novel Approach for Residual Curvature Correction During Penile Prosthesis Implantation in Patients With Severe Peyronie’s Disease Using the Collagen Fleece TachoSil. *J Sex Med* 2018;15:416-21.
6. Hatzichristodoulou G. A Novel Approach for Residual Curvature Correction during Inflatable Penile Prosthesis Implantation in Patients with Peyronie’s disease: The PICS Technique. *Video J Prosth Urol* 2018;2:139.
7. Hatzichristodoulou G. Inflation of device and check for residual curvature, opening of Buck’s fascia and mobilization of neurovascular bundle, with the device in place. *Asvide* 2019;6:199. Available online: <http://www.asvide.com/article/view/32884>
8. Hatzichristodoulou G. Plaque incision at point of maximum curvature, with the device inflated. *Asvide* 2019;6:200. Available online: <http://www.asvide.com/article/view/32885>
9. Hatzichristodoulou G. Closure/sealing of tunical defect with TachoSil, closure of Buck’s fascia, and check for end-result of straightening. *Asvide* 2019;6:201. Available online: <http://www.asvide.com/article/view/32886>

doi: 10.21037/jovs.2019.06.04

Cite this article as: Hatzichristodoulou G. Inflatable penile prosthesis with plaque incision and grafting with TachoSil for Peyronie’s disease (PICS Technique). *J Vis Surg* 2019;5:62.