

## ORIGINAL RESEARCH

## Comparative Analysis of Tunical Plication vs. Intralesional Injection Therapy for Ventral Peyronie's Disease

Faysal A. Yafi, MD, FRCS,\* Georgios Hatzichristodoulou, MD,† Christopher J. Knodler, MD,\* Landon W. Trost, MD,‡ Suresh C. Sikka, PhD, HCLD,\* and Wayne J.G. Hellstrom, MD, FACS\*

\*Department of Urology, Tulane University School of Medicine, New Orleans, LA, USA; †Department of Urology, Technical University of Munich, Munich, Germany; ‡Department of Urology, Mayo Clinic, Rochester, MN, USA

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### ABSTRACT

**Introduction.** Approximately 10% of Peyronie's disease (PD) patients present with ventral curvatures and, as such, there is a paucity of data describing the optimal approach for treatment.

**Aim.** This study aims to compare the outcomes of surgery (tunica plication [TP]) and intralesional injection (ILI) therapy (interferon- $\alpha$ 2b) in men with ventral PD.

**Materials and Methods.** Retrospective data were collected from two centers: Tulane University (ILI) and Technical University of Munich (TP). Collected variables included patient demographics, pre- and post-treatment sexual function, rigorous penile measurements (curvature, length, and penile vascular findings), and post-treatment outcomes.

**Results.** A total of 35 patients with ventral PD (21 ILI and 14 TP) were included in the study. There were no significant differences between the two groups prior to the interventions. There was a significantly better improvement in mean curvature with TP (46.4 degrees) as compared with ILI (9.3),  $P < 0.0001$ . TP was also associated with a significantly higher rate of  $\geq 20\%$  improvement in curvature as compared with ILI (100% vs. 67%,  $P = 0.027$ ). Although there was no significant difference in post-treatment change in Sexual Health Inventory for Men (SHIM) scores between the groups, 36% of the ILI patients noted an improved SHIM score as compared with none in the TP group. Erect penile length was preserved or improved in 67% of the ILI group vs. 14% of the TP group,  $P = 0.005$ .

**Conclusions.** TP confers a better overall improvement in penile curvature as compared with ILI in patients with ventral PD. Preserved or improved erect penile length and SHIM scores may be observed in patients undergoing ILI. **Yafi FA, Hatzichristodoulou G, Knodler CJ, Trost LW, Sikka SC, and Hellstrom WJG. Comparative analysis of tunical plication vs. intralesional injection therapy for ventral Peyronie's disease. J Sex Med 2015;12:2492–2498.**

**Key Words.** Peyronie's Disease; Ventral Plaque; Ventral Curvature; Intralesional Injection; Tunical Plication; Interferon  $\alpha$ 2b

### Introduction

Peyronie's disease (PD) is an idiopathic wound healing disorder of the tunica albuginea with prevalence rates ranging between 5% and 13% in the general male population [1,2]. It may or may not be associated with recall of trauma but is gen-

erally postulated to be a consequence of repetitive micro-trauma to the tunica albuginea [3]. The disease consists of two phases: the initial or acute phase, which may manifest as penile pain upon erection and intercourse as well as progressive penile curvature; followed by the chronic, or quiescent phase, which is marked by stabilization of

the penile curvature or abnormality, occurring 6–18 months after initial onset [4].

Approximately 9% of all PD plaques are located on the ventral aspect of the penis [5]. As such, due to its infrequent prevalence, there is a paucity of data regarding management. In patients with ventral PD and poor erectile function not responding to phosphodiesterase type 5 inhibitors (PDE5), implantation of an inflatable penile prosthesis with or without use of ancillary straightening procedures is recommended [6,7]. The dilemma, however, is how to best manage patients in whom erectile function is preserved. Options for treatment in this cohort include intralesional injection therapy or surgical intervention.

We have previously published our results using intralesional injection (ILI) therapy with interferon- $\alpha 2b$  for the management of ventral PD [8]. In this study, however, we sought to compare the performance of ILI to surgical intervention for the management of these patients.

## Materials and Methods

### Patient Population

Retrospective data were collected for PD patients with ventral curvature who underwent ILI therapy between January 2001 and July 2015 or TP between January 2010 and July 2015 from two academic centers: Tulane University (ILI, group 1) and Technical University of Munich (TP, group 2). A ventral plaque was defined as a palpable plaque between the 3 and 9 o'clock positions of the penis when examining the penis directly. A total of 35 patients were included in the study (21 ILI, 14 TP). Patients with a greater than 90-degree curvature, erectile dysfunction (ED) refractory to PDE5 therapy, and complex or multiplanar curvature were not recommended for ILI therapy or TP. Charts were reviewed, and data were collected pre- and postintervention regarding various patient demographics, sexual function, penile measurements such as curvature and length, penile vascular findings, and treatment outcomes.

### Doppler Evaluation and Measurements

All patients underwent baseline penile duplex Doppler ultrasound (PDDU) after intracavernosal injection of a vasodilator agent before and after intervention. Peak systolic velocity (PSV), end-diastolic vascular velocity (EDV), and resistive index (RI) were documented and used to assess the etiology of ED. Arterial insufficiency was defined

as PSV < 30 cm per second and EDV 5 cm per second or less, veno-occlusive dysfunction as EDV > 5 cm per second and PSV 30 cm per second or greater, mixed vascular disorder as PSV < 25 cm per second and EDV > 5 cm per second, and finally nonvascular etiology as PSV > 30 cm per second, EDV 5 cm per second or less and RI > 0.8. Studies were performed by a single experienced operator in each institution using a standardized technique [9].

As described previously, penile length and circumference measurements were performed prior to ICI and after reaching peak ICI erection [10]. The penile length was measured from the base of the penis (pubic bone) at the pubo-penile junction to the tip of glans, in both its flaccid state and following maximum manual stretch. Postinjection length was measured once peak erection was achieved.

### Intralesional Injection Therapy

Intralesional interferon (IFN) treatment consisted of 12 biweekly injections of 2,000,000 U IFN suspended in 10 mL normal saline using a multiple puncture technique [11]. Patients underwent PDDU after ICI with prostaglandin E1 (5–15  $\mu$ g) 2–4 weeks before and 6–8 weeks after the final ILI. Response to ILI IFN was defined as  $\geq 20\%$  improvement in baseline penile curvature as previously described [8,11].

### Tunical Plication Surgery

Surgery was performed under general anesthesia in all patients. First, a circumcising degloving incision was performed. Following lateral dissection and mobilization of the neurovascular bundle on both sides, an artificial erection was performed to assess the degree of deformity and the point of maximum curvature. An ellipsoid excision of the tunica albuginea was then performed over the area of maximum curvature on the convex side of deviation. According to the extent of deviation, the excision of the tunica was approximately 0.5–1.5 cm longitudinally, and 2.0 cm transversely, respectively. Tunical defect closure was performed using interrupted absorbable Polydioxanone (PDS®, Ethicon, Somerville, NJ, USA) 2-0 sutures with inverted knots. Correction outcomes were documented intraoperatively by repeated artificial erections using physiological saline after placement of a tourniquet at the base of the penis. Following correction, the neurovascular bundle was re-approximated with a running Monocryl® 4-0 suture (Ethicon) on both sides. Penile skin closure

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