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# The Multiple-Slit Technique (MUST) for Penile Length and Girth Restoration

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ABSTRACT

**Background:** Patients with severe erectile dysfunction (ED) and penile size issues, especially seen in Peyronie's disease (PD), are candidates for more invasive penile prosthesis insertion techniques that aim for penile length and girth reconstruction.

**Aim:** To present the feasibility and safety of penile length and girth restoration based on the so-called multiple-slit technique (MUST) for patients with severe ED and significant penile shortening with or without PD.

**Methods:** From July 2013 through January 2016, 138 patients underwent the MUST. The International Index of Erectile Function (IIEF) and the Erectile Dysfunction Inventory of Treatment Satisfaction were completed.

**Outcomes:** Outcome analysis was focused on penile length restoration, penile curvature correction, intra- and postoperative complications, and patient satisfaction.

**Results:** 138 patients underwent the procedure (103 malleable and 35 inflatable devices). Etiologies of penile shortening and narrowing were PD, severe ED, post-radical prostatectomy, and androgen-deprivation therapy with or without brachytherapy or external radiotherapy for prostate cancer, and post-penile fracture in 60.1%, 24.6%, 10.1%, 3.6%, and 2.2%, respectively. In PD cases, the mean deviation of the penile axis was 55° (range = 0−90°). Mean subjective penile length loss reported was 3.2 cm (range = 1−5 cm), and shaft constriction was present in 44.9%. Median follow-up was 15.2 months (range = 6−36 months). Mean penile length gain was 3.1 cm (range = 2−5 cm). No penile prosthesis infection caused device explantation. One glans necrosis was encountered. The average IIEF score increased from 22 points at baseline to 66 points at 6-month follow-up.

**Clinical Implications:** The MUST helps address penile size issues in cases of severe ED with concomitant conditions that impair penile length or girth.

**Strengths and Limitations:** The strength of the study is its applicability to provide surgeons with a solution for cases in which patients have severe ED and penile size impairment owing to underlying conditions such as PD. The study is limited by the relatively short follow-up.

**Conclusions:** The MUST is an effective, safe, and viable treatment option for a selected patient cohort. Because of the potential complications, proper counseling should take place and only experienced surgeons should perform this type of surgery. **Egydio PH, Kuehhas FE. The Multiple-Slit Technique (MUST) for Penile Length and Girth Restoration. J Sex Med 2017;XX:XXX−XXX.**



**Key Words:** Penile Prosthesis; Peyronie's Disease; Penile Lengthening

## INTRODUCTION

Penile shortening can have a negative effect on the psychological well-being of men. Data indicate that decreased penile length and girth and the inability to participate in sexual intercourse can lead to severe emotional challenges, dissatisfaction, and decreased quality of life in a large percentage of men.[1] Penile size issues are mainly present in conditions such as Peyronie's disease (PD),[2,3] in prostate cancer after radical prostatectomy,[4] or androgen suppression[5] with or without radiation therapy,[6] in cases of failed Nesbit operations,[7] and in fibrotic changes from recurrent priapism.[8]

These conditions are often associated with therapy-resistant erectile dysfunction (ED), which makes the affected patient eligible for a penile prosthesis insertion. A simple penile prosthesis

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**Table 1.** Patient characteristics

| | |
|---|---|
| Age (y), mean (range) | 55 (40–72) |
| Patients, n | 138 |
| Cause of ED and penile shortening,% (n) | |
| Peyronie's disease | 60.1 (83) |
| Severe erectile dysfunction | 24.6 (34) |
| Radical prostatectomy | 10.1 (14) |
| ADT with or without radiotherapy | 3.6 (5) |
| Penile fracture | 2.2 (3) |
| Curvature, mean (range) | 55 (0–90) |
| Flaccid stretched penile length (cm), mean (range) | 9.8 (7.6–14.3) |
| IIEF score (5–75), mean (range) | 22 (11–25) |
| Subjective loss of penile length, % (n) | |
| Yes | 100 (138) |
| No | 0 (0) |
| Subjective penile length loss (cm), mean (range) | 3.2 (1–5) |
| Shaft constriction, % (n) | 44.9 (62) |
| IIEF score preoperatively, mean (range) | 22 (11–39) |

ADT = androgen-deprivation therapy; ED = erectile dysfunction; IIEF = International Index of Erectile Function.

**Table 2.** Surgical outcome data

| | |
|---|---|
| Follow-up (mo) mean (range) | 15.2 (6–36) |
| Type of penile implant | |
| Coloplast Titan OTR | 103 |
| Coloplast Genesis | 35 |
| Operative time (min), mean (range) | |
| Coloplast Titan OTR | 140 (100–165) |
| Coloplast Genesis | 100 (80–140) |
| Glanspexy | 50 (69) |
| Penile length gain (cm), mean (range) | 3.1 (2–5) |
| Curvature correction, % (n) | 100 (83) |
| IIEF score postoperatively, mean (range) | 66 (55–74) |
| EDITS score (11–55), mean (range) | 49.6 (30–55) |
| Complications, % (n) | |
| Hematoma | 18.8 (26) |
| Temporary glans numbness | 2.9 (4) |
| Temporary anorgasmia | 5.1 (7) |
| Glans necrosis | 0.7 (1) |
| Penile prosthesis infection | 0 (0) |

EDITS = Erectile Dysfunction Inventory of Treatment Satisfaction; IIEF = International Index of Erectile Function.

insertion can lead to penile length loss.[9,10] This additional penile length loss can exacerbate the patient's emotional problems.[2,11,12] This is shown by the fact that patients with PD who underwent a simple penile prosthesis insertion show a higher dissatisfaction rate compared with the standard penile prosthesis population. The underlying reason for these lower satisfaction rates is believed to be caused by the additional length loss.[11]

More invasive techniques such as the circular tunica incision technique with grafting,[13,14] the sliding technique,[15,16] and the modified sliding technique (MOST) address these potential length issues.[17,18]

## INDICATION FOR MULTIPLE-SLIT TECHNIQUE

The multiple-slit technique (MUST) is an evolution of the aforementioned techniques.[15–18] Its goal is to restore penile length, girth, and functionality of the penis in patients with penile deformities affecting the penile anatomy and severe ED.

This study evaluated the functional and subjective outcomes associated with concomitant penile length and girth restoration based on the MUST with malleable or inflatable penile prosthesis insertion.

## METHODS

From July 2013 through January 2016, 138 patients underwent the MUST (Table 1). In 35 patients a 3-piece inflatable penile prosthesis (Coloplast Titan OTR; Coloplast Corporation, Minneapolis, MN, USA) was implanted and in 103 patients a malleable penile prosthesis (Coloplast Genesis; Coloplast Corporation) was used (Table 2). All patients had severe therapy-resistant ED that was associated with penile shortening and/or penile narrowing with or without PD, were unable to engage in penetrative sexual intercourse, and were dissatisfied with their sexual life.

### Preoperative Preparation

During the preoperative outpatient evaluation, an artificial erection was induced (with prostaglandin $E_1$ 20 $\mu$g or papaverine 100 mg) to assess penile shape and subjective penile shortening. In addition, vascular function was assessed using color duplex sonography.

All patients expressed deep concerns regarding the decrease in penile length and/or girth and inquired whether it was possible to restore these qualities. Therefore, patients were asked to quantify their subjective penile length loss in centimeters. All patients were given all the necessary information about the surgical procedure, potential risks and side effects, and provided a written consent.

The International Index of Erectile Function (IIEF) was completed before the surgery and at the 6-month follow-up visit. To evaluate satisfaction with treatment, the Erectile Dysfunction Inventory of Treatment Satisfaction (EDITS)[19] questionnaire was administered at the 6-month follow-up visit (Table 2).

Follow-up visits were offered to patients routinely at 2 weeks, 1, 3, and 6 months postoperatively, and then yearly. Furthermore, we evaluated the preoperative vs postoperative change in penile length and intraoperative and postoperative complications.

### Intraoperative Considerations and Surgical Technique

To avoid glans ischemia, patients needed to take acetylsalicylic acid 50 mg starting 2 days before surgery for a total of 2 weeks.