

## PERIURETHRAL COLLAGEN FOR URINARY INCONTINENCE AFTER GENDER REASSIGNMENT SURGERY

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**ABSTRACT**—We report on 2 patients, one female and one male transsexual; in both, Type III stress urinary incontinence developed after gender reassignment surgery. Both patients were treated by periurethral injection of glutaraldehyde cross-linked collagen resulting in a marked symptomatic improvement in association with a significant rise in abdominal leak point pressures. We believe these are the first reported cases of collagen injection being used for urinary incontinence after gender reassignment surgery.

The reported prevalence of transsexualism varies between 1:25,000 and 1:100,000 with a reported male:female ratio of between 5:1 and 20:1.<sup>1-3</sup> Considerable controversy exists regarding the indications for gender reassignment surgery as well as the various surgical techniques used. For patients undergoing this type of surgery, specific postoperative complications include graft infection, fistula formation, urethral and neovaginal stenosis, impotence, and continuing psychosexual dysfunction.<sup>4-7</sup> Although urethral and vesical fistulas appear to be the most common cause of urinary incontinence, the urethral sphincteric mechanism also may be disrupted as a result of surgery.

Twenty years ago, polytef was introduced for the treatment of stress urinary incontinence.<sup>8,9</sup> Subsequent long-term follow-up has led to concern of particle migration and long-term results.<sup>10-12</sup> Periurethral collagen has been used successfully for the treatment of patients with intrinsic sphincter dysfunction without associated morbidity.<sup>13</sup>

Collagen, a glutaraldehyde cross-linked bovine-derived material has been the subject of a multicenter study.<sup>14-18</sup> Briefly, the material produces a significant increase in the ability of the urethra to withstand abdominal pressure as an expulsive force.<sup>19,20</sup> In a three-year follow-up period, 80 percent of patients who became continent after colla-

gen injection remained continent.<sup>17</sup> The primary indication for use of the material is poor intrinsic urethral closing function associated with leakage at low to very low abdominal pressures.<sup>21-23</sup> In females, this type of incontinence is associated with a fixed urethral position and leakage at abdominal pressures less than 60 cm of water.<sup>20</sup> In males, incontinence after prostatectomy leakage occurs at abdominal pressures less than 100 cm of water.<sup>18</sup>

We report on 2 transsexual patients, one female and one male; in both severe stress incontinence developed after gender reassignment surgery. Both patients were treated by periurethral injection of glutaraldehyde cross-linked collagen resulting in marked symptomatic improvement in association with a significant rise in abdominal leak point pressures. We believe these are the first reported cases of collagen injection being used for urinary incontinence after gender reassignment surgery.

### CASE REPORTS

#### CASE 1

A thirty-five-year-old female transsexual with severe stress urinary incontinence was referred to the University of Michigan Medical Center. The patient had undergone gender reassignment surgery over three years previously. This included a colpohysterectomy, adnexectomy, bilateral mastectomy, phalloplasty (using a rectus abdominis muscle graft), and urethra transposition. Numerous postoperative complications developed

*Submitted: February 12, 1993, accepted (with revisions): June 24, 1993*

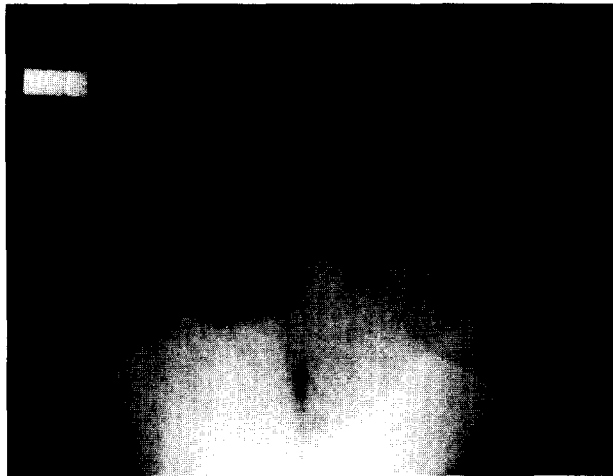


FIGURE 1. Abdominal leak point pressure of 28 cm water in female transsexual after gender reassignment surgery.

including recurrent urethrocutaneous fistulas, urethral diverticula, urethral calculi, meatal stenosis, and severe stress urinary incontinence. Further reconstructive procedures were performed including a gracilis myocutaneous graft to the site of recurrent fistula formation, perineal urethroplasty, and bladder neck needle suspension. The patient remained incontinent, voiding urine through the site of the original urethral meatus. Fluorourodynamic evaluation revealed severe Type III stress urinary incontinence with a widely open bladder neck and an abdominal leak point pressure of 28 cm water (Fig. 1). Over the following eighteen months, this patient underwent cystoscopic transurethral collagen injection on four occasions. A total of 70 cc of collagen was used. Ten months after the last treatment, her leak point pressure is in excess of 128 cm water. She enjoys a significant symptomatic improvement, only wearing a pad during jogging for minimal stress urinary incontinence.

#### CASE 2

A thirty-seven-year-old male transsexual presented with stress urinary incontinence, having undergone gender reassignment surgery more than three years previously. This included bilateral breast augmentation, bilateral orchiectomy, penectomy, urethral transposition, and vaginoplasty using invaginated penoscrotal flaps. Postoperative complications included graft infection, vaginal stenosis, and urinary incontinence. The patient was maintained on continuous oral estrogen. Fluorourodynamic evaluation revealed Type III stress urinary incontinence with a leak point pressure of 87 cm water (Fig. 2). Digital rectal examination

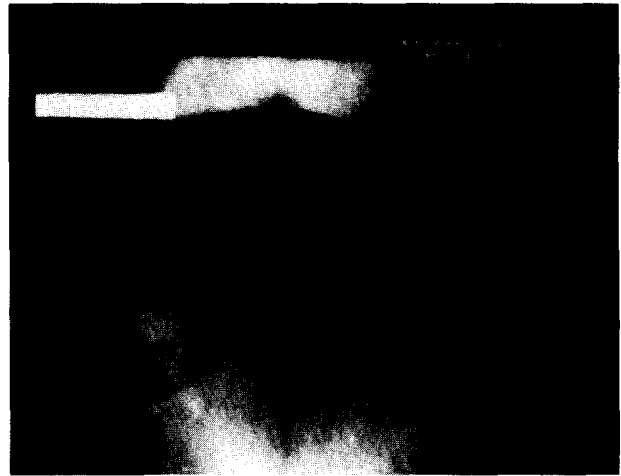


FIGURE 2. Abdominal leak point pressure of 87 cm water in male transsexual after gender reassignment surgery.

revealed an atrophic prostate gland. This patient subsequently underwent cystoscopic transurethral collagen injection on two occasions. A total of 25 cc of collagen were used. Seven months after the last treatment, this patient complains only of mild urge urinary incontinence. Repeat fluorourodynamic assessment reveals a leak point pressure of 126 cm water.

#### COMMENT

Direct urethral sphincter injury and denervation are the probable causes of Type III stress urinary incontinence in both patients reported. In the male transsexual patient, estrogen-induced prostate atrophy may be an additional factor contributing to incontinence. Surgical correction of Type III stress urinary incontinence requires either sling suspension of the bladder neck or artificial sphincter insertion.<sup>24,25</sup> Anatomic distortion and tissue fibrosis in these cases would render these procedures both technically difficult and potentially hazardous.

Injectable collagen has been available since 1983 and was initially used in plastic surgery.<sup>26</sup> Studies revealed that the majority of collagen was reabsorbed in ninety days.<sup>27</sup> Since that time, collagen has been cross-linked with glutaraldehyde which in human studies seems to provide a matrix for the ingrowth of host collagen providing a more permanent urethral coaptation.<sup>18,28</sup>

The results of multicenter trials suggest that glutaraldehyde cross-linked collagen maintains a urethral continence effect against abdominal pressure for periods up to two years after injection.<sup>17,18,20,21</sup> The effect is objectively measured by

determining the amount of abdominal pressure required to induce urinary leakage prior to and following collagen injection. That measurement is the most valid method to assess the strength of the urethral sphincter vis a vis abdominal pressure. Collagen injection provided a significantly lower risk therapeutic option for the patients described in this report. Both tolerated the procedure well and were satisfied with the outcome. Although the indications and techniques of gender reassignment surgery remain subjects of controversy, periurethral collagen injection appears to have a role in the treatment of urinary incontinence arising after such surgery.

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