OUTCOME RESULTS OF TRANSURETHRAL COLLAGEN INJECTION FOR FEMALE STRESS INCONTINENCE: ASSESSMENT BY URINARY INCONTINENCE SCORE

ASNAT GROUTZ,* JERRY G. BLAIVAS,† STUART S. KESLER, JEFFREY P. WEISS‡ AND DAVID C. CHAIKIN

From the Weill Medical College, Cornell University, New York, New York

ABSTRACT

Purpose: We assessed the results of collagen injection for female sphincteric incontinence using strict subjective and objective criteria.

Materials and Methods: We evaluated 63 consecutive women with sphincteric incontinence who underwent a total of 131 transurethral collagen injections. Sphincteric incontinence was confirmed by urodynamics. All patients were treated with 1 to 5 transurethral collagen injections and treatment outcome was classified according to a new outcome score. Cure was defined as no urinary loss due to urge or stress incontinence documented by a 24-hour diary and pad test, and patient assessment that cure was achieved. Failure was defined as poor objective results and patient assessment that treatment failed. Cases that did not fulfill these cure and failure criteria were considered improved and further classified as a good, fair or poor response.

Results: Mean patient age plus or minus standard deviation was 67.7 ± 12.8 years. All women had a long history of severe stress urinary incontinence, 18 (29%) underwent previous anti-incontinence surgery, and 41% had combined stress and urge incontinence. Preoperatively diary and pad tests revealed a mean of 7.5 ± 4.6 incontinence episodes and 152 ± 172 gm. of urine lost per 24 hours. Overall 1 to 5 injections were given in 26, 17, 13, 3 and 4 patients, respectively. Mean interval between injections was 4.4 ± 5.7 months, mean followup was 12 ± 9.6 months, and mean interval between the final injection and outcome assessment was 6.4 ± 4.9 months. There was a statistically significant decrease in the total number of incontinence episodes per 24-hour voiding diary after each injection session. Although there was a clear trend toward decreased urinary loss per 24-hour pad test, statistical significance was not established. Using the strict criteria of our outcome score overall 13% of procedures were classified as cure, 10%, 17% and 42% as good, fair and poor, respectively, and 18% as failure.

Conclusions: As defined by strict subjective and objective criteria, we noted a low short-term cure rate after collagen injection in women with severe sphincteric incontinence. It remains to be determined how patients with less severe incontinence would fare using our outcome assessment instruments.

KEY WORDS: urethra; urinary incontinence, stress; collagen; outcome assessment (health care)

Injection therapy for female sphincteric incontinence has been done for decades. Although the American Urological Association Female Stress Urinary Incontinence Clinical Guidelines Panel concluded that retropubic suspension and sling surgery are the most efficacious therapy for stress incontinence,1 injection is still occasionally indicated or preferred. The main indications for injection are the high risk of major surgery, previous surgical failure and patient preference.

Injected bulking agents cause passive occlusion of the urethra, and are presumed to enhance mucosal sealing and coaptation. Injected collagen is also known to create a fibrous network that develops the appearance of normal host tissue with time.2 Although early studies of collagen injection showed a short-term to mid-term cure or improvement rate of 48% to 95%, long-term outcome has been much less favorable.2,3

Outcome results of anti-incontinence procedures are usually reported as cure, improvement or failure. However, to date there are no standard definitions of these terms and no standard, widely accepted clinical tools for assessing outcome after anti-incontinence therapy. Recently we presented a new outcome score incorporating the popular clinical tools of a 24-hour diary, 24-hour pad test and patient questionnaire (see Appendix).4 The new score was constructed in a simple format that is easy to remember. It is divided into the categories of cure, good response, fair response, poor response and failure. We previously used this score to evaluate the long-term outcome of pubovaginal sling surgery and it seemed to reflect the surgical results more accurately. In the

Accepted for publication July 21, 2000.
* Financial interest and/or other relationship with Institute for Bladder and Prostate Research.
† Financial interest and/or other relationship with Institute for Bladder and Prostate Research.
‡ Financial interest and/or other relationship with ARC, Calmia Medical, Collagenesis, Influence and UroCor.
§ Financial interest and/or other relationship with Ferring-AB Copenhagen.
current study we used this new outcome score to assess the results of collagen injection for female sphincteric incontinence.

METHODS

We evaluated 63 consecutive women with a mean age of 67 ± 12.8 years who underwent a total of 131 transurethral collagen injections using a Contigen's collagen implant for sphincteric incontinence. In all cases a long history of stress urinary incontinence was the main complaint and previous anti-incontinence surgery had been done in 18 (29%). About half of the patients had combined stress and urge incontinence. The latter component had been managed by medication, behavioral modification, pelvic floor exercise and so forth. Sphincteric incontinence was confirmed by urodynamics in all patients. Of 8 patients with concomitant urethral hypermobility 5 also had grade 3 urogenital prolapse. Table 1 lists patient characteristics.

All patients underwent collagen skin testing 1 month before treatment. Contraindications to injection therapy included hypersensitivity to collagen and urinary tract infection. Additional injections were performed as needed during followup.

All patients underwent a meticulous baseline evaluation, including a complete history and physical examination, standard urinary questionnaire, 24-hour voiding diary, 24-hour pad test, urine culture, noninvasive uroflowmetry, post-void residual urine volume measurement, video urodynamics and urethrocystoscopy. Methods, definitions and units conformed to the standards recommended by the International Continence Society except as specifically noted. Multichannel video urodynamics were performed according to the recommendations of the International Continence Society except for cystometry. Contrary to these recommendations patients were not instructed to inhibit voiding during the filling phase, but rather to report sensations to the examiner. Cystometry was performed using radiographic contrast material and a 7Fr double lumen catheter via constant infusion at a medium fill rate with rectal pressure monitoring. Sphincteric incontinence was defined as visible urinary leakage during increased abdominal pressure with absent detrusor activity.

The collagen implant syringe contained 2.5 ml of sterile purified bovine dermal glutaraldehyde cross-linked collagen dispersed in phosphate buffered physiological saline. All injections were done transurethrally using an 18Fr hysteroscope. The needle was advanced into the urethral wall just below the bladder neck and the implant was injected submucosally until urethral coaptation was observed at the needle penetration site. Injections were repeated at multiple sites as needed. Determination of the prevalence of persistent stress or urge incontinence was performed according to our new outcome score. Overall 13%, respectively. In 3 cases persistent urge incontinence was associated with preexisting mixed incontinence. Persistent stress incontinence was noted in 50% to 75% of patients, while in most persistent urge incontinence was associated with preexisting mixed incontinence. New onset urge incontinence developed in only 1 case after injection 2. In 3 cases transient urinary retention required intermittent self-catheterization for up to 3 days. No other complications or side effects were associated with injection therapy.

Table 2 shows treatment characteristics and results. We analyzed results separately for each of the 5 injection sessions. Thus, 63, 37, 20, 7 and 4 patients were available for outcome analysis after injections 1 to 5, respectively. There was a statistically significant decrease in the total number of incontinence episodes per 24-hour voiding diary after each of the 5 injection sessions. In addition, there was a clear trend toward decreased urinary loss per 24-hour pad test, although statistical significance was not established.

We also analyzed outcome results of persistent stress or urge incontinence separately for each of the 5 injection sessions (table 2). Results were documented by the questionnaire, 24-hour diary and pad studies, and stress test with a comfortably full bladder. Determination of the prevalence of persistent stress or urge incontinence was based on the definitive urodynamic diagnosis of sphincteric incontinence or detrusor instability at the baseline evaluation. Persistent stress incontinence was not in 50% to 75% of patients, while in most persistent urge incontinence was associated with preexisting mixed incontinence. New onset urge incontinence developed in only 1 case after injection 2. In 3 cases transient urinary retention required intermittent self-catheterization for up to 3 days. No other complications or side effects were associated with injection therapy.

Table 3 lists the outcome results of 131 injection procedures, as classified by our new outcome score. Overall 13%, 10%, 17%, 42% and 18% of procedures resulted in short-term to mid-term cure, a good, fair or poor response, and failure, respectively. Pubovaginal sling surgery was eventually performed in 7 patients (11% of the study population). These women were significantly younger with a mean age of 57 ± 18.8 versus 69 ± 11.5 years (p = 0.01) and they initially underwent collagen injection electively. Preoperatively a mean of 2.0 ± 0.9 injections per patient were done (range 1 to 3) and the mean interval from injection 1 to surgery was 11.1 ± 15.4 months (range 1 to 48). Postoperatively 6 of 7 women were considered cured and 1 had persistent urge incontinence.
Previously others assessed collagen outcome by direct patient questionnaire. In our series only 13% of injection procedures resulted in cure, whereas 10% were classified as good, 17% fair and 42% poor response, and 18% were considered the condition subjectively improved.

The relatively low cure rate in our series concurs with the recent series of 99 patients of Tschopp et al, who performed time to failure analysis. In their study failure was considered as patient dissatisfaction with results or surgery assessment of the degree of incontinence as worse or no better than preoperative status based on postoperative symptoms and/or pad use. The median duration of success was 4.7 months. Statistical analysis using a survival curve indicated only a 13% probability of success 18 months after injection. We further analyzed our results according to the total number of collagen injections and observed a similar rate of cure and various degrees of improvement or failure after 1 to 5 injections. This finding is also in accordance with the results of Tschopp and Khullar et al, who reported similar success rates of injections 1 and 2.

Pubovaginal sling surgery was eventually done in 7 of our patients (11% overall), of whom 6 were cured and 1 had persistent urge incontinence postoperatively. Pubovaginal sling surgery is the most effective and durable operation for urinary incontinence due to urethral hypermobility or intrinsic sphincter deficiency. In a previous study we assessed long-term outcome in 94 consecutive women with sphincteric incontinence who underwent this procedure.4 Of 14 patients (26% of the study population) who reported 5-year followup results of periurethral collagen injection, 3 of 14 patients (21.4%) were considered cured.

Conclusions

In our series only 13% of injection procedures resulted in cure, whereas 10% were classified as good, 17% fair and 42% poor, and 18% as failure. We believe that these relative low cure and good response rates are due to severe incontinence in our patients, and the stringent objective and subjective definition of cure and improvement. Furthermore, gross classification into cure, improvement and failure may fail to reflect accurately true clinical status. Strict criteria for cure and failure as well as the detailed differentiation of various degrees of improvement (good, fair and poor response) indicated by our new response score may provide a more meaningful tool for assessing outcome.
criteria used to define outcome. It remains to be determined how patients with less severe incontinence would fare using our outcome assessment instruments.

APPENDIX: SIMPLIFIED URINARY INCONTINENCE SCORE FOR EVALUATING TREATMENT OUTCOME

Postoperative 24-hour voiding diary:
0—No urge or stress urinary incontinence episodes
1—One or 2 incontinence episodes
2—Three or more incontinence episodes

Postoperative 24-hour pad test:
0—Total weight gain of the pads 8 gm. or less
1—Total weight gain of the pads 9 to 20 gm.
2—Total weight gain of the pads greater than 20 gm.

Patient questionnaire:
0—The patient considers herself cured
1—The patient considers herself improved
2—The patient considers that treatment failed

Total score and outcome:
0—Cure
1—2—Good response
3—4—Fair response
5—Poor response
6—Failure

REFERENCES