Abdominoperineal Urethral Suspension: A Report of 20 Cases

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EDITORIAL COMMENT: We accepted this paper for publication because we consider Zacharin’s operation does not enjoy the popularity it deserves — it is also ironical that this operation and the anatomy of the pubourethral ligament as described by Zacharin, and on which the technique is based, has been acknowledged in overseas journals (Obstet Gynecol Surv 1989; 44: 833) but not our own. Zacharin uses abdominoperineal urethral suspension exclusively for patients with recurrent stress incontinence but he, unlike the authors of this paper, does not advocate its use as a primary procedure when there is uterovaginal prolapse. Most of the 335 patients Zacharin has operated on in the past 20 years for the relief of stress incontinence have had previous surgery, although there were a few without prolapse who had not (personal communication to the editor). Zacharin reported an 85% overall cure rate for his operation after long-term follow-up in a series of 194 women treated during the 15 years, 1965-1980 (Obstet Gynecol 1983; 62: 644-654). During the past 15 years Zacharin has been invited to perform his abdominoperineal urethral suspension procedure in university centres in the United States, Canada, Europe, the United Kingdom, Africa and Asia. The editorial board is unaware

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of any other Australian gynaecologist who is repeatedly asked to demonstrate a surgical procedure abroad - it seems appropriate that the technique be reexamined by all gynaecologists who treat patients for stress incontinence when it recurs after primary surgery.

Summary: Twenty patients adjudged to require surgical management of genuine stress incontinence underwent the abdomino-perineal urethral suspension procedure between May, 1989 and February, 1990. Short-term subjective follow-up revealed a 94% cure and improved rate in 19 patients in whom the operation was completed. There was a striking absence of postoperative voiding morbidity. We believe this somewhat neglected procedure is worthy of further objective study and comparison with the more popular methods of surgical management of genuine stress incontinence.

Genuine stress incontinence is a common clinical problem in women and accounts for the majority of referrals to gynaecological urodynamic clinics (1). It is defined by the International Continence Society as the involuntary loss of urine occurring when the intravesical pressure exceeds the maximal urethral pressure in the absence of a detrusor contraction. Over the years many surgical procedures have been devised to attempt to correct this problem. The operations fall into 4 broad groups:

1. The vaginal repair (Kelly urethropexy)
   This is still a technique taught to every young gynaecological resident. It is effective in controlling anterior vaginal wall prolapse, but its success in curing genuine stress incontinence is disappointing at around 60% in most published series (2). In its favour it is relatively free of morbidity and is well tolerated in infirm or elderly patients, but is still associated with postoperative retention of urine.

2. Retropubic procedures
   It is the Burch colposuspension, in itself a modification of the original Marshall, Marchetti and Krantz procedure, which has achieved some preeminence and is now the operation of choice for many gynaecologists and urologists. It is very effective in the elevation of the urethrovesical junction and its cure rate is high (3). However, it also produces an element of urethral obstruction leading to voiding difficulties and even permanent retention in a small but significant proportion of patients. The appearance of postoperative frequency and urgency is also a common problem and the production of a de novo detrusor instability in 10% of patients is a demoralizing side-effect (4).

3. Needle suspension procedures
   These operations have gained in popularity over the years because of their speed and simplicity, particularly in the elderly or recurrent case, with poor anterior vaginal wall mobility. There have been a number of modifications of the original procedure first described by Percy in 1959, the most popular being that described by Stamey (5). As with retropubic procedures, the success rates of all types of needle suspensions are good. The long-term success rates are probably better, however, with the more formal dissections of the retro-

4. Urethral slings
   The place of urethral slings in the operative armamentarium of the urogynaecologist remains uncertain. They are often used in recurrent cases with marked limitation of anterior vaginal wall mobility due to fibrosis from previous operations. Perhaps because of this they have come to be regarded as 'last resort' procedures. Not surprisingly their reputation in these situations is not good. As well as failure, voiding difficulties and retention are very troublesome problems. Infection is also a problem in those centres that use synthetic sling materials such as silastic.
   It is clear that despite the large choice of procedures facing the surgeon, the perfect operation with a 100% success rate and minimal morbidity has yet to be developed.

Dissatisfaction with the morbidity associated with current surgical methods of surgical treatment of stress incontinence led one of us (DSB) to adopt a novel procedure first described by Gleadell and Zacharin in 1957, abdominoperineal urethral suspension (8). The intention of this paper is to report the initial results of such treatment in the first 20 patients.

METHODS
   Twenty patients adjudged to require surgical management of genuine stress incontinence underwent the abdominoperineal urethral suspension procedure between May, 1989 and February, 1990. No other arbitrary selection criteria were used and no other form of surgical management was used throughout this time.
   Patients were recruited from a gynaecological urodynamic clinic. Following a full history, obtained using a 2 page proforma, patients underwent urodynamic investigations including free flowmetry, filling and provocative subtraction cystometry and urethral pressure testing, at rest and during stress. All methods and testing conform to standards proposed by the International Continence Society unless otherwise stated. There were no exclusions on the grounds of previous surgery to the lower genital tract.
Table 1. Summary of Results in the First 20 Patients Treated with Abdominoperineal Urethral Suspension

<table>
<thead>
<tr>
<th>Date of operation</th>
<th>Age</th>
<th>Previous surgery</th>
<th>Urodynamic diagnosis</th>
<th>Hospital stay (days)</th>
<th>Complications</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.5.89</td>
<td>54</td>
<td>Anterior repair</td>
<td>GSI</td>
<td>11</td>
<td>Wound infection</td>
<td>Cure</td>
</tr>
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<td>29.5.89</td>
<td>45</td>
<td></td>
<td>GSI</td>
<td>4</td>
<td></td>
<td>Cure</td>
</tr>
<tr>
<td>29.5.89</td>
<td>59</td>
<td></td>
<td>GSI</td>
<td>7</td>
<td></td>
<td>Cure</td>
</tr>
<tr>
<td>31.5.89</td>
<td>38</td>
<td>Anterior repair</td>
<td>GSI-DI</td>
<td>6</td>
<td>Wound infection, incisional hernia</td>
<td>Cure</td>
</tr>
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<td></td>
<td>GSI</td>
<td>5</td>
<td></td>
<td></td>
</tr>
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<td>48</td>
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<td>30.6.89</td>
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<td>18</td>
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<td>Fail</td>
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<td>GSI</td>
<td>7</td>
<td></td>
<td>Cure</td>
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<td>5</td>
<td></td>
<td>Cure</td>
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<td>7</td>
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<td></td>
</tr>
<tr>
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<td>Hysterectomy</td>
<td>GSI</td>
<td>4</td>
<td></td>
<td>Cure</td>
</tr>
<tr>
<td>28.8.89</td>
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<td>Vaginal repair</td>
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<td>Wound infection</td>
<td>Cure</td>
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(SSI = genuine stress incontinence; DI = detrusor instability). In Case 7 the rectus fascia disintegrated on mobilizing the strips and so the procedure was abandoned and a colposuspension performed, which failed. The patient is currently awaiting the insertion of an artificial sphincter. In Cases 5 and 16 the suspension was performed together with a vaginal hysterectomy.

Operative technique
The technique is well documented elsewhere (9, 10). The basic principles can be summarized as follows, but as practised throughout this study differ in no important regard from the published accounts.

The procedure is accomplished as a synchronous abdominal and perineal procedure. Two strips of aponeurosis are prepared through a Pfannenstiel incision and the retropubic space developed as in a colposuspension. An inverted Y incision is then made above the urethra, protected by a metal catheter and the posterior pubourethral ligaments are identified. Two small transverse incisions are made in the vaginal wall just beneath these ligaments. The fascial strips previously prepared are then led through the ligaments and stitched to the vaginal wall with a bare minimum of tension. It is not the purpose of the operation to elevate the proximal urethra and bladder neck as in the colposuspension, but merely to support the pubourethral ligament and prevent downward and backward excurs of the urethra.

A 12Fr gauge Foley catheter is inserted post-operatively and a Penrose drain is left in the retropubic space, exiting from the inverted Y incision. A suction drain is also left in the retropubic space and the wound closed. The Foley catheter is left on continuous drainage for 48 hours and then removed. In the most usual situation the drains can also be removed at this time.

Success or failure on follow up was measured subjectively by the patients themselves. "Cure" denoted perfect control with no symptomatic stress incontinence of urine. "Fail" denoted no discernible improvement when compared with preoperative symptoms.

RESULTS
The postoperative results are summarized in Table 1. Seventeen patients (85%) were totally cured at follow-up ranging from 3 to 7 months. One patient was markedly improved with only occasional leaks. The preoperative urodynamic diagnosis in this patient was combined genuine stress incontinence (SSI) and detrusor instability (DI).

There were 2 failures:
Case 7. This was an elderly patient who had previously undergone a Pererya-type needle suspension. Adequate fascial strips could not be formed due to the poor and flimsy quality of the tissues. The urethral suspension was abandoned and a Burch colposuspension performed. This failed.
Case 16. This patient had combined GSI and DI and was aged 71. Initially a cure was obtained, but a bout of flu 3 weeks following the operation resulted in a severe coughing episode and the return of stress incontinence.

In Cases 5 and 6 the urethral suspension was combined with a vaginal hysterectomy for dysfunctional bleeding, resulting in cure of incontinence in both patients.

In the first 10 patients the length of hospital stay was variable. Latterly, with increasing familiarity of the technique, stays of as short as 3 days have been recorded, with an average of 5 to 6 days.

Complications
These were gratifyingly few. Wound infections were a relatively common problem occurring in some 20% of cases. This presumably reflects that fact that it is a combined abdominal and vaginal procedure. These rates should be reduced by the more vigorous use of prophylactic antibiotics. Previous abdominal surgery can make the cutting of fascial bands a problem but this was usually not insurmountable. A small incisional hernia was seen in 1 of the patients, reflecting difficulties of
sheath closure; Zacharin (10), recommended the use of mersilene mesh if the sheath is difficult to close.

**Voiding Difficulties**

Spontaneous and efficient voiding was accomplished in all patients on removal of the Foley catheter. No alteration of subjective voiding characteristics was seen in this series.

**DISCUSSION**

Concepts regarding the aetiology of stress incontinence in women have been dominated by the work of Enhorning, published in 1961 (11). He maintained that the female bladder neck and proximal urethra must remain within the 'abdominal pressure zone' (i.e. above the pelvic floor), during manœuvres which raise the intraabdominal pressure if continence is to be assured. If the bladder neck slides down and out of this zone, intravesical pressure may exceed intralabial pressure and lead to urinary leakage. The results of bladder neck relocation surgery strongly imply that pressure transmission is of extreme importance to continence. It is self-evident that the bladder neck mechanism cannot be operative when the pelvic floor and its ligamentous system is slackened.

The posterior urethral ligaments extend from the back of the pubis on either side of the midline, and are inserted into the adventitia of the mid-urethra. The assumption has always been that these ligaments passively prevent backward and downward excursions of the urethra during increases in intraabdominal pressure. However, histologically, these ligaments contain a great deal of smooth muscle which receives a rich autonomic innervation similar to that of the detrusor. It is likely that active contraction of these elements plays an underestimated role in the maintenance of the urethral and bladder neck position. Further elaboration of the anatomy and functional significance of these structures has been recently reported by Delancey, emphasizing the complexity of this active role (12). Passive stretching following childbirth or the loss of oestrogen support at the menopause is unlikely to be the complete story. Moreover, increasing evidence is implicating autonomic denervation in the genesis of genuine stress incontinence and prolapse, a process which almost certainly also involves the neural supply of the pubourethral ligaments (13).

Abdominoperineal urethral suspension is unique in its attempt to achieve specific surgical support of the posterior pubourethral ligaments. Its aim is to reproduce the action of an actively contracting ligament during activities which increase the intraabdominal pressure. Support is provided at a precise point along the urethra by strips of aponoeurasis which are led laterally around the rectus muscles. This configuration allows tension to be increased by the action of these muscles at the time of increased pressure. There is no attempt to artificially raise the level of the urethra or bladder neck. In our limited experience it appears to be very suitable to use in the presence of prolapse since it can be successfully combined with a vaginal hysterectomy.

The short-term subjective cure rate of abdominoperineal urethral suspension is very good and equal to other suprapubic procedures. One beneficial consequence of not raising the bladder neck to an artificially high level appears to be the total absence of postoperative voiding difficulties. In our experience these very troublesome difficulties are often played down in the published literature. They lead to a significant amount of patient dissatisfaction with the results of even ostensibly successful operations. Even if the long-term cure rate is confirmed to be better than more established techniques, the absence of voiding difficulties would make this procedure worthy of further study. Zacharin's experience has suggested its usefulness in recurrent stress incontinence (10).

Abdominoperineal urethral suspension has a number of theoretical advantages over existing surgical techniques to manage genuine stress incontinence of urine. These theoretical advantages appear to be confirmed in this short preliminary study of our experience of the procedure. It is an operation which has been neglected over the years in preference to other treatment options, particularly the Burch colposuspension, needle suspensions and suburethral slings. We believe it to be worthy of further study and long-term objective assessment, particularly in regard to its apparent absence of voiding morbidity.

**References**