The vaginal strips sling operation
An alternative procedure for urinary incontinence

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Summary

An alternative approach to the treatment of marked anterior vaginal prolapse and urinary incontinence is presented. Two strips of vaginal skin are used to elevate and suspend the bladder neck and the proximal third of the urethra. Of 82 patients who underwent the operation, 37 had had previous bladder neck repairs for urinary incontinence. A 95.1% success rate was achieved. The procedure is worth considering under certain circumstances.

Patients and methods

Since 1972, 82 private patients with marked vaginal prolapse and urinary incontinence have been selected for the vaginal strips sling operation; 51 (62.2%) presented with stress incontinence and 31 (37.8%) with stress incontinence and detrusor instability.

Urinary incontinence is a common complaint, frequently associated with anterior vaginal prolapse. There are numerous operations that can be used to treat it; many initially succeed, but permanent cure is often difficult to attain.

Genuine stress incontinence was defined as involuntary loss of urine when the intravesical pressure, as a result of an increase in intra-abdominal pressure (in the absence of detrusor activity), exceeds resistance by the urethral closure mechanism. An unstable or irritable bladder with detrusor instability was excluded detrusor dysfunction.

Of the 82 patients, 11 were aged under 40 years, 61 between 40 and 60 years, and 11 over 60 years; 75 were obese. Only 16 patients had no previous surgery. Of the 66 who had previously had such operations, 29 had had an abdominal hysterectomy, 4 an abdominal hysterectomy and a Marshall-Marchetti-Krantz procedure, 5 patients an abdominal hysterectomy with a Marshall-Marchetti-Krantz procedure and anterior and posterior repair, 6 an abdominal hysterectomy and anterior and posterior repair, 14 a vaginal hysterectomy with anterior and posterior repair, 4 a vaginal hysterectomy with anterior and posterior repair and a Marshall-Marchetti-Krantz procedure, and 4 anterior and posterior repair; 37 patients (45%) had undergone bladder neck repair for urinary incontinence.

The operation

With the patient in the lithotomy position, a Foley catheter (No. 26) is inserted to identify the bladder neck. The cervix, or the vaginal vault, is drawn down with vulsellum forceps. A transverse incision is made anterior to the cervix, or the vaginal vault if the patient has had a hysterectomy. The anterior vaginal wall is now separated from the bladder with curved Mayo scissors to within 0.5 cm of the bladder neck. A wide strip of anterior vaginal wall is thus fashioned; it is divided vertically to its base into two strips 2 - 3 cm wide. A 30 cm length of 00 nylon suture is tied to the loose end of each strip. With the patient in the lithotomy position, a Foley catheter is inserted to identify the bladder neck. The cervix, or the vaginal vault, is drawn down with vulsellum forceps. A transverse incision is made anterior to the cervix, or the vaginal vault if the patient has had a hysterectomy. The anterior vaginal wall is now separated from the bladder with curved Mayo scissors to within 0.5 cm of the bladder neck. A wide strip of anterior vaginal wall is thus fashioned; it is divided vertically to its base into two strips 2 - 3 cm wide. A 30 cm length of 00 nylon suture is tied to the loose end of each strip (Fig. 1). Where indicated a routine vaginal hysterectomy is performed at this stage, after which the peritoneum is closed. The surgeon now proceeds with the suspension part of the operation.

At the level of the bladder neck a tunnel is made immediately beneath the vaginal wall on each side, lateral to each strip, using blunt dissection. The tunnel is advanced anterolaterally to the immediate posterior aspect of the pubic bone to approach the retropubic space between the pubis and the endopelvic fascia.

At this stage a small 2 - 3 cm vertical or transverse supra pubic incision to enter into the retropubic space is made, and with the Foley catheter as a guide the bladder and bladder neck are digitally stripped from the pubis down to the levator fascia. Great care is taken not to injure the urethra, bladder or ureters. With a finger inserted in the abdominal incision as guide, the Maingot forceps, grasping the nylon attached to the vaginal strip, are pushed from below through the prepared tunnel on the side of the bladder neck.

The Maingot forceps should be kept close to the pubis and as far as possible from the urethra and bladder to prevent injury. The nylon thread is pulled through the midline incision between the rectus fascia, bringing the attached vaginal strip into the retropubic space. The same procedure is followed on the other side. Cystoscopic examination is advised to check for abnormal bleeding and bladder trauma after each strip is inserted.

Each nylon suture is then threaded through the rectus fascia on the same side approximately 2 - 3 cm above the symphysis pubis.
Follow-up ranged from 14 months to 13 years. Seventy-five patients were followed up for at least 2 years and 35 for at least 5 years. Of the 82 patients operated on 78 subsequently had no urinary problems, a cure rate of 95.1%. No cyst formation occurred.

In 4 cases (4.9%) urinary incontinence recurred; all these patients were among the first 50 operated on. The first, a 61-year-old woman with marked postmenopausal atrophy, had had a strip suspension with anterior and posterior repair. A pinpoint-sized vesicovaginal fistula was found and repaired. The second, a 44-year-old woman who had had a strip suspension with vaginal hysterectomy, was found to have a relaxed posterior urethrovesical angle and required a modified Marshall-Marchetti-Krantz operation. The third, who was 47 years old and very obese, had had a strip suspension with anterior and posterior repair. Examination revealed a relaxed posterior urethrovesical angle, and she underwent an anterior repair with insertion of Kelly’s sutures. The fourth patient, a 67-year-old woman with marked postmenopausal atrophy, had had a strip suspension with vaginal hysterectomy. She was found to have a relaxed posterior urethrovesical angle and required a modified Marshall-Marchetti-Krantz procedure. These 4 patients have been followed up for 2 - 7 years and are all now symptom-free.

Discussion

On initial clinical evaluation 51 patients (62.2%) were found to have stress incontinence and 31 (37.8%) stress incontinence and detrusor instability. On doing urodynamic studies Dwyer et al. found that 63% of their patients had stress incontinence and 27% detrusor instability, and Thiede and Sain showed a 66% incidence of genuine stress incontinence and a 14% incidence of detrusor instability; 18% of their patients had a combination of the two.

For surgical treatment of marked vaginal prolapse and urinary incontinence to be successful, the bladder neck and proximal urethra must be elevated and replaced within the abdominal zone of pressure, thus improving urethral pressure transmission. Funnelling of the bladder neck is also partly, if not by restructuring of the urethrovesical angle and increasing the supporting tissue. This improves both the ability of the urethra to respond to sudden increases in abdominal pressure and the tolerance level in urethral closure pressure.

Restructuring of the urethrovesical angle is also important in patients with urge incontinence alone, caused by distension of the proximal urethra. Surgical elevation of the posterior urethrovesical angle may therefore be necessary when a patient with detrusor instability resulting in urge incontinence does not respond to anticholinergic drugs.

Despite the existence of many different treatment modalities, it is still difficult to achieve permanent cure of urinary stress incontinence and new approaches are regularly being evaluated. Not being totally satisfied with existing procedures, I decided to evaluate a different approach combining vaginal repair with abdominal suspension. This was especially indicated in obese patients with extensive anterior vaginal wall prolapse and urinary incontinence and in patients who had had previous bladder neck repair operations. I performed my first vaginal strip suspension in 1972 and was so impressed with the results that I decided to carry on using the procedure. Bologna used a similar procedure, which he described in 1978, in 40 patients. He anchored the vaginal strips by two sutures attached to each strip and tied them to Cooper’s ligament on the respective side. I attach the elongated strips to the rectus fascia with nylon, and the small suprapubic incision is made to admit only one finger.

Thorough pre-operative evaluation of these patients is very important. The operation is not difficult to perform and takes

Results

The vaginal strip suspension operation was successfully carried out in all 82 patients. Additional procedures performed were vaginal hysterectomy with anterior and posterior repair in 18 patients (21.9%), anterior and posterior repair in 51 (62.2%), and anterior repair in 13 (15.9%).

Two patients (2.4%) sustained injury to the bladder during the operation. In both cases this was due to inadequate mobilisation of the bladder neck. Blood was noted in the urine, and 1 patient required surgical exploration. Both recovered well and were symptom-free postoperatively.

There were 4 long-term complications (4.9%). One patient developed a vault prolapse and 1 a wound sinus, which was excised. The third patient also developed a wound sinus, excision of which was followed by anterior repair and a Cowan and Morgan urethropexy. The fourth patient presented with an anterior vaginal prolapse after 1 year and underwent anterior vaginal repair. All 4 complications were treated successfully.

Pubis, and by applying tension the bladder neck is elevated to a position slightly higher than is desired. The sutures are tied.

The anterior vaginal wall is sutured with a single layer of interrupted Vicryl or No. 1 Dexon, beginning at the bladder neck immediately proximal and adjacent to the vaginal strips. If indicated, a posterior repair is performed. A retropubic drain is inserted and the abdominal incision sutured in layers. Prophylactic antibiotics are administered routinely, and neomycin is instilled into the bladder daily for 6 days.

The catheter is clamped on the 4th postoperative day and removed on the 6th day. If residual urine is in excess of 100 ml, a catheter is re-inserted and clamped and released every 4 hours for a further 2 days.

Fig. 1. A — vaginal strips; B — tunnel fashioned underneath anterior vaginal wall at level of bladder neck to enter retropubic space; C — abdominal finger in retropubic space to assist as a guide for the tip of the Maingot forceps with the vaginal strip.
about 30 - 45 minutes. However, special care must be taken to prevent injury to the urethra, bladder neck, bladder and ureters, and cystoscopic examination is advised after each strip is inserted. Under certain circumstances the insertion of ureteric catheters may be indicated before the operation.

Adequate retropubic stripping and freeing of the bladder and urethra from the pubis to the levator fascia are also very important, and there must be a well-opened vaginal tunnel on each side of the bladder neck up to the retropubic space. The vaginal strips sling procedure has a high success rate, and I feel that it is worth considering in certain circumstances.

REFERENCES


The *in vitro* fertilisation programme at Tygerberg Hospital and the University of Stellenbosch

Five years' experience, April 1983 - January 1988


Summary

The results of the *in vitro* fertilisation programme at Tygerberg Hospital for the period April 1983 to January 1988 are presented. Of the 1177 laparoscopies performed, 825 patients reached the transfer stage. A live-birth rate of 9.3% was achieved. The pregnancy rate after transfer of 4 embryos was 25.9% compared with 15.4% after 2 embryos and 10.8% after 3 embryos ($P = < 0.0001$). The multiple pregnancy rate was 2.8% in the group receiving 2 embryos and 11.7% and 10.4% in those receiving 3 and 4 embryos, respectively. Of the 77 successful pregnancies (90 babies), 1 baby died at 34 weeks' gestation as the result of abruptio placentae due to pre-eclampsia and 1 cot death occurred. The only congenital abnormality encountered was a cleft palate.


The birth of the first baby conceived by *in vitro* fertilisation (IVF) in this clinic opened a new era for infertility treatment in the RSA. At present at least 7 of the 11 clinics practising IVF in South Africa make use of the protocol established at Tygerberg Hospital.

Regular review of results of IVF programmes are essential for the medical and scientific staff to assess their techniques and results as well as to justify the expense involved in the use of this procedure. Review will also help to answer the often-asked question: 'How successful is IVF and what is the prognosis for a successful pregnancy?' It will also enable the IVF team to give the patient a more realistic prognostic prediction.

The results of patients treated by IVF in our unit over the 5-year period from April 1983 - January 1988 are therefore reviewed here.