Pubovaginal Sling for the Treatment of Female Stress Urinary Incontinence: Experience of 100 Cases at Ramathibodi Hospital

WACHIRA KOCHAKARN, M.D.*, CHAROEN LEENANUPUNTH, M.D.*,
KRISADA RATANA-OLARN, M.D.*, UBOLRAT ROONGREUNGSILP, B.Sc. (Nursing), M.Sc.**,
NICHA SIRIPORNPINYO, B.Sc. (Nursing)**

Abstract

Objective : To evaluate the outcome of pubovaginal sling procedure for treatment of female stress urinary incontinence.

Material and Method : From September 1997 to January 2000, one hundred consecutive patients with urodynamically proven stress incontinence had a pubovaginal sling procedure performed. Operative technique, intraoperative and post-operative complications, voiding patterns, residual urine as well as the follow-up course were reviewed.

Results : Of one hundred cases, the mean patient age was 52.6 years old (range 34-73). The etiologies of stress incontinence were 85 cases of urethral hypermobility and 15 cases of intrinsic sphincter deficiency (ISD). Eighteen cases were after failure of prior continence procedures. No intraoperative and post-operative complications were found except one case of wound infection. Minimal bleeding was noted. Marked post-operative residual urine (>100 ml) was found in 39 cases and clean intermittent catheterization was used. The mean time for catheterization was 8.9 weeks (range 2-12 weeks). The mean time to follow-up was 12.1 months (range 4-36 months). Ninety-four cases had been completely dried in the follow-up period since the last visit and 5 cases had much improvement of incontinence using only 1-2 pads/day. Only one case was found to have failed the procedure. *De novo* instability was found in 5 cases.

Conclusion : On the basis of these results, we propose that pubovaginal sling is an effective treatment for female stress incontinence with very few complications.

Key word : Pubovaginal Sling, Stress Urinary Incontinence, Surgery

**KOCHAKARN W, LEENANUPUNTH C,
RATANA-OLARN K, ROONGREUNGSILP U, SIRIPORNPINYO N
J Med Assoc Thai 2001; 84: 1412-1415**

* Division of Urology, Department of Surgery,
** Department of Nursing, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok 10400, Thailand.

The pubovaginal sling procedure has become the gold standard for the treatment of stress urinary incontinence (SUI) in women due to intrinsic sphincter deficiency and urethral hypermobility. Von Giordano[1] has used this procedure in 1907 but at that time it was used mainly for ISD. Initially, muscle and tendon were used to support the bladder neck and urethra so it was very difficult to perform and had many complications. Due to its complications, the sling procedure lost its popularity for the management of stress incontinence. McGuire and Lytton[2] re introduced this procedure for the treatment of type III stress urinary incontinence in 1978 and reported an 80 per cent success rate. Because of the modification of the procedure using a strip of rectus sheath, it became more popular for the treatment of stress incontinence. Blaivas and Jacobs[3] extended the indications for this procedure as the treatment of stress incontinence for both ISD and urethral hypermobility. They reported an overall success rate of 91 per cent. This procedure has been used as the main treatment for female stress incontinence at our institute since 1997. We present a series of patients with stress incontinence treated with pubovaginal sling procedure and also report the outcome as well as the complications of the procedure.

MATERIAL AND METHOD

From September 1997 to January 2000, one hundred consecutive patients with stress urinary incontinence had a pubovaginal sling procedure performed at the Division of Urology, Department of Surgery, Ramathibodi Hospital. The mean patient age was 52.6 years old (34-73). The etiologies of stress incontinence were 85 cases of hypermobility and 15 cases of intrinsic sphincter deficiency. Eighteen cases were after failure of *prior* continence procedures. (13 cases after anterior colporhaphy, 2 cases after Stamey's operation, one case after Raz's operation and 2 case after Burch operation).

Pre-operative evaluation included Marshall stress test in both supine and upright position, cystography for evaluation of bladder neck, cystometry and valsalva leak point pressure. Valsalva leak point pressure below 65 cm of water was classified as ISD. All of the patients who had abnormal detrusor contraction were excluded from this study. The procedure was done under general or spinal anesthesia with one strip of rectus sheath 2.5X6 cm harvested and used as a sling. Clean intermittent catheterization was needed if more than 100 ml of post-operative residual urine was found. Improvement of incontinence, voiding pattern, complications and number of pads used were evaluated on follow-up visit.

RESULTS

No intraoperative or post-operative complication was detected except for wound infection in one patient which cleared up with wound dressing for 2 weeks. Minimal bleeding was noted in all patients and blood transfusion was not required. Marked residual urine (>100 ml) was found in 39 cases and clean intermittent catheterization was needed. The mean time for catheterization was 8.9 weeks (2-12). The mean time to follow-up was 12.5 months (4-36). Ninety-four cases were completely dried and 5 cases were much improved using only 1-2 pads per day. Only one case was found to have failed. *De novo* instability was found in 5 cases.

DISCUSSION

Pubovaginal sling procedures for the treatment of stress urinary incontinence were first introduced by Von Giordano in 1907 using a gracilis muscle flap[1]. Since that time, numerous modifications of both surgical approach and materials used for the sling have been published[1]. Aldridge described a sling made from rectus fascia in 1942[4] and Studdiford modified the technique easier by passing a single continuous strip of rectus fascia attached at one lateral margin under the urethra[5]. In 1969 Low used fascia lata as the sling material using a Masson stripper which left only a small incision at both the abdominal wall and donor site at lateral thigh[6]. Pubovaginal slings were associated with many complications and lost their popularity for the management of routine stress urinary incontinence[2]. The procedures were mainly used for patients with stress urinary incontinence due to intrinsic sphincter deficiency (ISD)[3].

In 1978, McGuire and Lytton reintroduced the sling procedure for the treatment of type III stress urinary incontinence using autologous rectus fascial strip to support the urethra and reported an 80 per cent overall success rate[2]. Blaivas and Jacobs in 1991 modified the procedure using a free fascial strip harvested from rectus sheath to treat stress urinary incontinence both from urethral hypermobility and ISD. To avoid the extensive retropubic dissection, they used the Stamey's needle for placing the sling. They reported an overall success rate of 91 per cent

(3). Another option for autograft sling was usage of an in-situ vascularized island of the anterior vaginal wall creating a sling with less dissection beneath the urethra. The success rate of the vaginal wall sling was 90 per cent(7). This study had a success rate after the sling procedure of 94 per cent which is the same as the previous study.

In recent years, there has been a growing interest in the use of synthetic materials as an alternative to the autologous fascia. Polytetrafluoroethylene, polypropylene, polyethylene and silastic have been used as a sling and showed a success rate of 81 per cent(8). The high rate of erosion and infection associated with synthetic materials has discouraged their use on a widespread basis(9).

Allograft fascia harvested from cadaveric donors and transplanted into a human recipient have been used in clinical practice for more than 25 years mostly in Ophthalmology and Orthopedic Surgery(10). In 1996, cadaveric fascia lata was used for treating stress urinary incontinence(11). Many series have reported the use of the cadaveric sheath for treating stress urinary incontinence and overall continence rates were 98 per cent and showed no significantly statistical difference from autograft(11).

The most common complication following a pubovaginal sling is prolonged urinary retention due to the effect of urethral outflow resistance(12). To prevent post-operative urinary retention, excess tension while placing the sling should be avoided (13). Overall incidence of post-operative urinary retention was 5 per cent(14) but in our series we had a very high urinary retention rate (39%). Most of our cases who had urinary retention were earlier cases and after the learning period urinary retention rate markedly declined. *De novo* instability has been found in 10-40 per cent of patients who did not have detrusor instability before the surgery(15). The causes of instability might be from extensive dissection in the anterior vaginal wall or some outflow obstruction. In our series, we dissected the anterior vaginal wall carefully, did not advance to the trigone, so we had de novo instability of only 5 per cent.

SUMMARY

The pubovaginal sling procedure is indicated in patients with stress urinary incontinence from both urethral hypermobility and ISD. The choice of sling material and operative approach should be at the surgeon's discretion. Surgical outcome is often better than that obtained by other procedures.

(Received for publication on October 31, 2000)

REFERENCES

1. Hofenfellner R, Petrie E. Sling procedures in surgery. In: Stanton SL, Tanagho E, eds. Surgery of female incontinence. 2nd ed. Berlin: Springer-Varlag, 1986: 105-13.
2. McGuire EJ, Lytton B. The pubovaginal sling in stress urinary incontinence. J Urol 1978; 119: 82-4.
3. Blaivas JG, Jacobs BZ. Pubovaginal fascial sling for the treatment of complicated stress urinary incontinence. J Urol 1991; 145: 1214-8.
4. Aldridge AH. Transplantation of fascia for relief of urinary stress incontinence. Am J Obstet Gynecol 1942; 44: 398-411.
5. Studdiford WE. Transplantation of abdominal fascia for relief of urinary stress incontinence. Am J Obstet Gynecol 1944; 47: 764-75.
6. Low JA. Management of severe anatomic deficiencies of urethral sphincter function by a combined procedure with a fascia lata sling. Am J Obstet Gynecol 1969; 105: 149-55.
7. Raz S, Siegel AL, Short JL, et al. Vaginal wall sling. J Urol 1989; 141: 43-6.
8. Hom D, Desautel MG, Lumerman JH, et al. Pubovaginal sling using polypropylene mesh and Vesica bone anchors. Urology 1998; 51: 708-13.
9. Kobayachi KC, Dmochowski R, Mee L, et al. Erosion of woven polyester pubovaginal sling. J Urol 1999; 162: 2070-2.
10. Handa VL, Jensen JK, Germain MM, et al. Banked human fascia lata for the suburethral sling procedure: A preliminary report. Am J Obstet Gynecol 1996; 88: 104.
11. Wright EJ, Iselin CE, Carr LK, et al. Pubovaginal sling using cadaveric allograft fascia for the treatment of intrinsic sphincter deficiency. J Urol 1998; 160: 759-62.

12. Morgan JE, Farrow GA, Stewart FE. The Marlex sling operation for the treatment of recurrent stress urinary incontinence. A 16-year review. Am J Obstet Gynecol 1985; 151: 224-6.
13. McGuire EJ, Lytton B, Pepe V, et al. Stress urinary incontinence. Obstet Gynecol 1976; 47: 255-64.
14. Hardley R. Use of the sling for management of intractable female stress urinary incontinence. Prob in Urol 1990; 4: 67-80.
15. Chaikin DC, Rosenthal J, Blaivas JG. Pubovaginal sling for all type of stress urinary incontinence- long term analysis. J Urol 1998; 160: 1312-6.

การผ่าตัด Pubovaginal sling เพื่อการรักษาภาวะไอ จาม ปัสสาวะเล็ด: ประสบการณ์ 100 ราย ที่โรงพยาบาลรามาธิบดี

วชิร คชการ, พ.บ., เจริญ ลีนานุพันธ์, พบ.*,*
กฤษฎา รัตนโอฬาร, พ.บ., อุบลรัตน์ รุ่งเรืองศิลป์, วท.บ., วท.ม.**, ณิชา ศิริพรภิญโญ, วท.บ.***

วัตถุประสงค์ : เพื่อศึกษาผลของการผ่าตัด pubovaginal sling รักษาภาวะไอจามปัสสาวะเล็ด

วัสดุและวิธีการ : ศึกษาผู้ป่วยที่ได้รับการผ่าตัด pubovaginal sling รักษา ไอจาม ปัสสาวะเล็ด ตั้งแต่เดือนกันยายน 2540- เดือนมกราคม 2543 จำนวนผู้ป่วย 100 ราย โดยศึกษาถึงวิธีการผ่าตัดอาการแทรกซ้อนทั้งระหว่างการผ่าตัดและหลังผ่าตัด การปัสสาวะหลังผ่าตัด และปัสสาวะตกค้าง

ผลของการศึกษา : อายุเฉลี่ยของผู้ป่วย 52.6 ปี (34-73) สาเหตุของไอจามปัสสาวะเล็ดเกิดจากการหย่อนตัวของหลอดปัสสาวะ 85 ราย และหลอดปัสสาวะเสื่อมหน้าที่ 15 ราย ไม่พบอาการแทรกซ้อนทั้งระหว่างการผ่าตัดและหลังผ่าตัด โดยเสียเลือดเพียงเล็กน้อย มีเพียง 1 รายที่มีแผลผ่าตัดอักเสบเป็นหนองแต่หายเป็นปกติหลังจากทำความสะอาดแผล 2 สัปดาห์ ผู้ป่วย 39 รายมีปัสสาวะตกค้างมากกว่า 100 มล. และต้องอาศัยการสวนปัสสาวะเป็นเวลาเฉลี่ย 8.9 สัปดาห์ (2-12) ระยะเวลาติดตามผู้ป่วยเฉลี่ย 12.1 เดือน (4-36) พบว่า 94 รายหายขาดไม่มีปัสสาวะเล็ดเลย อีก 5 รายอาการดีขึ้นใช้ผ้ารองซับเพียงวันละ 1-2 ผืน ส่วนผู้ป่วยอีก 1 รายไม่ประสบความสำเร็จหลังผ่าตัดยังคงมีปัสสาวะเล็ดราดอีกเช่นเดิม นอกจากนั้นพบว่าผู้ป่วยจำนวน 5 รายมีการบีบตัวของกระเพาะปัสสาวะผิดปกติหลังผ่าตัดโดยที่ก่อนผ่าตัดไม่มีภาวะนี้มาก่อน

สรุป : การผ่าตัด pubovaginal sling เป็นการผ่าตัดที่ได้ผลดี มีอาการแทรกซ้อนน้อยเหมาะกับการเลือกใช้เพื่อรักษาภาวะไอจามปัสสาวะเล็ด

คำสำคัญ : พูโบวาไจนอล สลิง, ไอ จาม ปัสสาวะเล็ด, การผ่าตัด

วชิร คชการ, เจริญ ลีนานุพันธ์,
กฤษฎา รัตนโอฬาร, อุบลรัตน์ รุ่งเรืองศิลป์, ณิชา ศิริพรภิญโญ
จดหมายเหตุทางแพทย์ ฯ 2544; 84: 1412-1415

* หน่วยศัลยศาสตร์ระบบปัสสาวะ, ภาควิชาศัลยศาสตร์,
** ภาควิชาพยาบาลศาสตร์, คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี, มหาวิทยาลัยมหิดล, กรุงเทพ ฯ 10400