



Long-term results with Nesbit's procedure as treatment of Peyronie's disease

G Savoca^{1*}, C Trombetta¹, S Ciampalini¹, S De Stefani¹, L Buttazzi¹ and E Belgrano¹

¹Department of Urology, University of Trieste, Italy

The objective was to assess sexual function at long-term follow-up after the Nesbit operation for Peyronie's disease.

One hundred and fifty seven out of 213 patients treated between 1986 and 1998 using the Nesbit procedure were reassessed by means of IIEF-5 questionnaire together with two questions about residual deformity and treatment satisfaction. The results from this questionnaire together with the patient case records constitute the basis of this paper.

After an average 72-month follow-up subjective patient determination of satisfaction indicated that 87.9% were satisfied with the results of surgery, 136 patients (86.7%) had good erectile function (IIEF-5 > 21). Shortening of the penis (from 1.5 to 3 cm) occurred in 22 patients (14%), but only in 2 (1.3%) was intercourse difficult because of excessive shortening.

In conclusion, the Nesbit's operation results in the greatest amount of patient satisfaction about sexual function. When penile shortening occurs, it has not been a significant problem for patients who are properly counselled. *International Journal of Impotence Research* (2000) 12, 289–293.

Keywords: Peyronie's disease; penis; Nesbit; acquired curvature; sexual function

Introduction

Peyronie's disease is the most frequent cause of penile curvature. Local inflammatory process leads, through fibrosis, to shortening and occasionally to calcification of the tunica albuginea.¹ Surgical treatment of Peyronie's disease is necessary when the penile curvature doesn't allow coitus. Rarely penile deformity is also associated with psychological problem.²

Numerous surgical techniques have been used to treat the penile deformity due to Peyronie's disease, but synthetically it can be corrected in one of two ways. The short side can be lengthened, which involves plaque incision or excision and grafting the defect with vein,³ dermis,⁴ tunica vaginalis,⁵ temporalis fascia⁶ or synthetic materials.⁷ Alternatively, the long side can be shortened, either by tunical plication or excision of an ellipse of tunica albuginea. This last technique was first proposed by Nesbit⁸ for correction of congenital penile curvature and then popularized in 1979 by Pryor⁹ for the treatment of Peyronie's disease.

We have reviewed the case histories of patients treated with Nesbit's procedure to assess the sexual function at long-term follow-up.

Materials and methods

An IIEF-5 questionnaire¹⁰ together with two questions about residual deformity and treatment satisfaction were sent to 213 patients (mean age 54 y, range 34–72) who were treated by means of Nesbit's between 1986 and 1998. The results from this questionnaire together with the patient case records constitute the basis of this paper. In this way it was possible to contact and reassess 157 patients (mean follow-up was 72 months, range 16–156).

Physical examination was repeated to assess exactly the entity of penile curvature when residual of deformity was referred greater than 10 degrees. As for penile shortening, patients status at the post-operative clinical control approximately 6 months after surgery was considered.

Patients' characteristics and surgical procedures

At the moment of surgery all patients had disease present for at least 1 y, stable disease for 6 months (neither pain nor progression of deformity). Pre-

*Correspondence: G Savoca, Clinica Urologica, Università di Trieste, Ospedale di Cattinara, Strada di Fiume 447-34149 Trieste, Italy.

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Table 1 Diagnostic procedures

Diagnostic procedure	Number of patients
Sexuological evaluation	157 (100%)
Physical examination	157 (100%)
Autophotography of penis	157 (100%)
NPT test	19 (12.1%)
Ecography or EcoDoppler of penis	65 (41.4%)
RMN of penis	5 (3.2%)
RX of penis	1 (0.6%)

Table 2 Site of the curvature and number of ellipses excised

Penile curvature	No. patients (%)	Number of Surgical excisions		
		Single	Double	Multiple
Dorsal	81 (51.6)	48 (30.6%)	26 (16.6%)	7 (4.4%)
Lateral	30 (19.1)	26 (16.6%)	4 (2.5%)	0
Ventral	19 (12.1)	15 (9.6%)	3 (1.9%)	1 (0.6%)
Combined	27 (17.2)	6 (3.8%)	11 (7%)	10 (6.4%)
Total	157	95	44	18

operative evaluation included sexuological history and evaluation of degree of penile angulation by office injection of an intracavernosal vasodilating agent or from patient's photograph, in all patients. Nocturnal penile tumescence test and dynamic Doppler ultrasound were required when we had doubts about the quality of penile erection. All patients had sufficient erections for intercourse before the operation.

More recently eco-color-Doppler was performed because it is better for the assessment of stabilization (41.4%). Penile magnetic resonance (MR) was also made in five patients and direct RX showed penile ossification in one patient¹¹ (Table 1).

Direction of curvature was dorsal in 81 patients (51.6%), lateral in 30 (19.1%), ventral in 19 (12.1%) and dorsolateral or ventrolateral in 27 (17.2%). Mean angle of curvature was 62 degrees (range 43–105).

General anaesthesia was performed in 68.7% of cases and local anaesthesia in the remaining 31.3%. The Nesbit technique was used with excision of single (60.6% of the patients), double (28%), or multiple (11.4%) ellipses of the tunica albuginea (Table 2). In 17 patients a supplementary horizontal closing of the longitudinal incision as described by Yachia¹² was needed to correct an hourglass deformity.

Results

In a mean follow-up of 72 months subjective patient determination of satisfaction indicated that 87.9% were satisfied with the results of surgery.

Penile curvature

Complete correction of penile deformity was achieved in 82.1% of patients. Residual curvature inferior to 20 degrees was seen postoperatively in 24 patients (15.3%), whereas in two patients (1.3%) it was 25 degrees. Over-correction (20°) occurred in only one patient (0.6%). The residual curvature doesn't prevent intercourse in any patient. Neither recurrent deformities nor progression of disease were reported at long-term follow-up.

Erectile function

All patients, except one (0.6%) had complete erection after operation. Moreover 15.9% of patients noticed a post-operative improvement of erection quality.

At long-term follow-up (mean 72 months) 136 patients (86.7%) had good erectile function (IIEF-5 > 21). On the contrary, 20 patients (12.7%) referred partial erectile dysfunction (IIEF range 10–21), whereas one patient (0.6%) had complete loss of erectile function (Table 3).

Penile shortening

Post-operatively significant shortening of the penis (from 1.5 to 3 cm) occurred in 22 patients (14%). In two of these patients intercourse was very difficult because of excessive shortening (Table 4). Not significant penile shortening (less than 1.5 cm) was registered in 86% of patients.

Table 3 Erectile function at long-term follow-up (mean = 72 months)

	IIEF-5 score			Total
	< 10	10–21	> 21	
No. patients	1 (0.6%)	20 (12.7%)	136 (86.7%)	157

Table 4 Relationship between penile shortening and coital function

cm	No. Patients (%)	Coital function		
		Normal	Possible	Impossible
< 1.5	135 (86%)	134 (85.4%)	1 (0.6%)	0
1.5–3	22 (14%)	19 (12.1%)	1 (0.6%)	2 (1.3%)
> 3	0	0	0	0

Table 5 Complications after Nesbit's procedure

Complication	Number
1. Urethral injury	1
2. Drainage of hematoma	1
3. Hematoma	14
4. Wound infection	4
5. Phimosis	3
6. Painful knot	3
7. Urinary infection	1
Total	27

Complications

A total of 27 complications occurred in 14% of patients (Table 5), but most of these were mild. Severe complications included one urethral injury which required fistula repair 3 months after penile straightening and one haematoma which required surgical drainage. In three patients, where the prepuce had been spared, secondary circumcision had to be performed due to oedema and phimosis. The removal of suture knots because of pain was necessary in three patients in which a non-absorbable suture was used (before 1988).

Discussion

Peyronie's disease is a benign self-limited process of scar formation on the tunica albuginea that can lead to penile bending. Surgical correction is reserved for patients in whom the penile deformity precludes normal sexual function. Therefore the main objective of surgical operations is to correct penile curvature to allow intercourse. The entity of curvature must be greater than 20 degrees to create real difficulties with intercourse, but in rare cases deformity is associated with psychological problems which are also required to be treated.

Many different surgical approaches have been used. In 1965 Nesbit⁸ first proposed an operation for correction of congenital penile curvature which subsequently became widely used for patients with Peyronie's disease. This technique provides to shape the penile shaft by removal of normal tissue opposite the site of the scar tissue plaque. Plaque incision or excision with grafting (derma, saphenous vein, tunica vaginalis and temporalis fascia) has also been used with mixed results.³⁻⁶ Residual curvature due to the graft contraction was the most common cause of failure. Erectile dysfunction also accounted for some of the failure. A supplementary problem is that a separate incision is required to harvest the graft.

In the present study we evaluated the main goals resulting from this surgery with Nesbit's technique, including penile straightening, erection and penile length preservation, and decreasing incidence of complications.

Using this procedure in 157 patients with Peyronie's disease we completely eliminated the curvature in 82.1% at mean follow-up of 72 months. Residual curvature in 24 (15.3%) patients was lower than 20 degrees and patients found it acceptable. Overall satisfaction rate was 87.9%. These results are comparable to those described by others¹³⁻¹⁸ with similar techniques (Table 6). Poulsen¹⁶ showed better results with the Nesbit operation than with simple plication of the tunica albuginea (91% vs 67%). Ralph¹⁷ reported an overall success rate of 82% but it improved to 90% in the series of patients treated after 1985 in which patient selection was more scrupulous. In our experience, the excision of the ellipses provides to avoid recurrences which are described with tunical plication. Tunical plication (Ebbehøj, Schroder-Essed)¹⁹⁻²⁰ offers the advantage that the corpora cavernosa are not opened, thus there isn't a gush of blood and saline from the inflated penis resulting in immediate partial detumescence. On the other hand, a high incidence of recurrence of the deformity is reported when absorbable sutures are used.²⁰ Typically these patients reported good initial results but with subsequent recurrence after few months. Probably

Table 6 Success rate reported in the literature with corporoplasties. Present study results in 82.1% of complete straightening. Patient subject satisfaction rate in brackets

Author	Technique	No. of patients	Success rate
Mufti (1994) ¹³	Nesbit	27	65%
Mufti (1994) ¹³	Plicature	13	62%
Sassine (1994) ¹⁴	Horizontal closing of longitudinal incision	23	95%
Nooter (1994) ¹⁵	Plicature	33	76%
Poulsen (1995) ¹⁶	Nesbit	48	91%
Poulsen (1995) ¹⁶	Plicature	9	67%
Ralph (1995) ¹⁷	Nesbit	359	82%
Licht (1997) ¹⁸	Nesbit	28	79%
Licht (1997) ¹⁸	Horizontal closing of longitudinal incision	30	83%
Present study	Nesbit	157	82.1% (87.9%)

the stitches can not withstand the traction during repeated erections in the early postoperative period. When nonabsorbable materials is used, the most common problem is granuloma formation around sutures. Nonabsorbable suture material should also not be used in order to avoid an unpleasant perception (bumps) under the skin.

Recently Levine²¹ proposed an algorithm for the surgical treatment of Peyronie's disease and he underlined the importance of the type and degree of the deformity. He concluded that simple curvatures with adequate erectile capacity were candidates for conservative procedure (shortening procedure). On the other hand, he recommended incisional-grafting procedures for complex, bidimensional curvatures and for the hourglass deformity.

In this study we successfully used a supplementary Yachia modified procedure¹² in 17 patients, to correct the hourglass deformity without performing a grafting procedure.

In our series it must be also noted that no progression of disease occurred in any patient. Therefore, we emphasize the importance of waiting for the stabilization of plaque before operating.

We investigated the sexual function in long-term follow-up after Nesbit's procedure for Peyronie's disease. Our data confirm that this technique is a safe method to guarantee erectile function in most patients. In 20 patients (12.7%) there was a gradual loss of rigidity after many months, but the partial erectile dysfunction (ED) could be attributed to diabetes or vascular risk factors in 17 of these patients. On the contrary, it must be noted that 25 patients (15.9%) reported an improvement of their erection quality after the operation according to data reported by Claes²² with plication technique.

Therefore, the threat of erectile dysfunction is very low and failure is often associated with preoperative erectile dysfunction. Preoperatively cavernosal injection of a vaso-active agent allows for a more precise evaluation of erectile function. Moreover, according to Brock²³ hemodynamic assessment with Doppler ultrasound can be performed in selected cases. In patients who don't respond to an injection of vasodilator agents or oral Sildenafil administration, a penile prosthesis implantation remains a viable and effective treatment modality.

Penile shortening is inevitable with excision of the ellipses of tunica and some authors believe that this is unacceptable to many patients.²⁴ In our series penile shortening does not affect coitus in most patients. Of the 22 patients with significant shortening of more than 1.5 cm, only two patients were concerned about it. In both patients the penis became too short for satisfactory intercourse. Since penile shortening could cause important psychological problems to the patients, we believe that this issue should be clearly discussed before operating. The surgeons could also deduce preoperatively the

entity of shortening by measuring the length of the penis and the degrees of curvature.

Complications were mild and acceptable with the exclusion of one case of urethral injury. We think that circumcision must be performed to prevent oedema of the prepuce and phimosis. The use of absorbable suture (PDS 3-0) did not cause suture-related complications. To avoid hematomas the penis can be wrapped by a Lyofoam® dressing and an 8 F pediatric feeding tube is placed as vesical catheter.

Conclusion

The Nesbit's operation is a simple and safe method to correct penile deformity due to Peyronie's disease. In our experience high percentage of penile complete straightening was achieved. This technique results in the greatest amount of patient satisfaction about sexual function. When penile shortening occurs, it has not been a significant problem for patients who are properly counselled. However, those patients who insist on lengthening their penis may benefit from other types of surgical approach.

References

- 1 Gellhard MK, Dorey F, James K. The natural history of Peyronie's disease. *J Urol* 1990; **144**: 1376.
- 2 Roddy TM, Goldstein I, Devine CJ. *Peyronie's Disease*. Part II. AUA Update Series, American Urologic Association, 1991; vol 10: lesson 2.
- 3 Lue TF, El-Sakka AI. Venous patch graft for Peyronie's disease. Part I: technique. *J Urol* 1998; **160**: 2047–2049.
- 4 Devine CJ, Horton CE. Surgical treatment of Peyronie's disease with a dermal graft. *J Urol* 1974; **111**: 44–49.
- 5 Das S. Peyronie's disease: excision and autografting with tunica vaginalis. *J Urol* 1980; **124**: 818.
- 6 Gelbard MK, Hayden B. Expanding contractures of the tunica albuginea due to Peyronie's disease with temporalis fascia free grafts. *J Urol* 1991; **145**: 772.
- 7 Lowe DH, Ho PC, Parsons CL, Schmidt JD. Surgical treatment of Peyronie's disease with dacron graft. *Urology* 1982; **19**: 609.
- 8 Nesbit RM. Congenital curvature of the phallus: report of three cases with description of corrective operation. *J Urol* 1965; **93**: 230.
- 9 Pryor JP, Fitzpatrick JM. A new approach to the correction of the penile deformities in Peyronie's disease. *J Urol* 1979; **122**: 622.
- 10 Rosen RC et al. Constructing and evaluating the 'sexual health inventory for men (IIEF-5)' as a new diagnostic tool for erectile dysfunction (ED). *Int J Impot Res* 1998; **10**(Suppl 3): S35.
- 11 Liguori G, Trombetta C, Savoca G, Belgrano E. Penile ossification: a model radiological presentation. *Br J Urol* 1998; **81**: 334.
- 12 Yachia D. Modified corporoplasty for the treatment of penile curvature. *J Urol* 1990; **143**: 80.
- 13 Mufti GR et al. Corporeal plication for surgical correction of Peyronie's disease. *J Urol* 1990; **144**: 281–282.
- 14 Sassine AM, Wespes E, Shulman CC. Modified corporoplasty for penile curvature: 10 years' experience. *Urology* 1994; **44**: 419–421.

- 15 Nooter RI, Bosch JLHR, Schroder FH. Peyronie's disease and congenital penile curvature: long-term results of operative treatment with the plication procedure. *Br J Urol* 1994; **74**: 497–500.
- 16 Poulsen J, Kirkeby HJ. Treatment of penile curvature—a retrospective study of 175 patients operated with plication of the tunica albuginea or with the Nesbit procedure. *Br J Urol* 1995; **73**: 370–374.
- 17 Ralph DJ, Mahmoud A, Pryor JP. The Nesbit operation for Peyronie's disease: 16 years' experience. *J Urol* 1995; **154**: 1362–1363.
- 18 Licht MR, Lewis RW. Modified Nesbit procedure for the treatment of Peyronie's disease: a comparative outcome analysis. *J Urol* 1997; **158**: 460–463.
- 19 Ebbehøj J, Metz P. New operation for 'Krummerik' (penile curvature). *Urology* 1985; **26**: 76–78.
- 20 Brake M et al. Operative correction of penile deviation with the Nesbit procedure and with Schroeder-Essed technique *Urologe Ausgabe A*. 1999; **38**: 264–269.
- 21 Levine LA, Lenting EL. A surgical algorithm for the treatment of Peyronie's disease. *J Urol* 1997; **158**: 2149–2152.
- 22 Claes R, Baert L. Corporeal plication in Peyronie's disease improves rigidity. *Int J Impot Res* 1995; **7**: 119.
- 23 Brock G, Kadioglu A, Lue TF. Peyronie's disease: a modified treatment. *Urology* 1993; **42**: 300–304.
- 24 Carrier S, Lue TF. For Peyronie's disease, act conservatively. *Contemp Urol* 1994; **6**: 53.