

CONGENITAL PENILE CURVATURE WITH ORTHOTOPIC MEATUS: A REPORT ON THE MANAGEMENT OF 62 CASES FOLLOWING A SYSTEMATIC APPROACH

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Objectives We are presenting our experience with a systematic approach in the management of congenital penile curvature (CPC).

Patients and Methods Between 1993 and 2000, 62 cases of CPC were treated. Ten of 34 cases (30%) presenting with ventral curvature were corrected via excision of the dysgenetic tissue and complete mobilization of the corpus spongiosum only. Two cases (6%) had a minimal corporeal disproportion that required a ventral longitudinal deep intercorporeal incision. Six cases (18%) were managed with Nesbit's procedure, and tunica albuginea plication (TAP) was done in 8 cases (24%). These cases required mobilization of the neurovascular bundle (NVB). Four patients (12%) had a small phallus and required ventral grafts (dermal in two and venous grafts in another two). The remaining four patients (12%) had a short urethra and were managed by excision of the tethering corpus urethrae and neourethral reconstruction. Cases presenting with lateral curvature (14 patients) were managed by a lateral longitudinal incision at the point of maximum curvature followed by TAP in 10 cases (71%) and Nesbit's procedure in four (29%). Dorsal curvatures (6 cases) were managed by

ventral Nesbit in four (67%) and ventral TAP in the remaining two cases (33%). Patients with a complex curvature (8 cases) were managed by sequential TAP on an individual basis according to the results of intraoperative artificial erection in 5 cases (63%) and by complete penile disassembly. The follow-up period ranged from 6 months to 2 years, and the results were satisfactory in the majority of patients. None of our patients developed impotence. Penile haematoma occurred in 6.4% and penile numbness in 19% (persistent in 3%), while foreign body sensation was felt in 8%. None of our patients experienced painful erections beyond three months after operation. A residual curvature was noticed in 9.6%, and it required a second step Nesbit's procedure in only 3%.

Conclusion Management of CPC can result in a very high success rate as long as a systematic stepwise approach is applied with an appropriate preoperative patients counseling. We recommend the limited use of Nesbit's procedure (unless TAP fails to correct the curvature) together with a gentle handling of the NVB.

Key Words Penile curvature, tunica albuginea plication, Nesbit's procedure

INTRODUCTION

Congenital penile curvature (CPC) without hypospadias represents a spectrum of diseases that is fraught with several misnomers and controversies in describing the pathogenesis and in proposing treatment. From the pathologic point of view the best classification defining CPC is that proposed by Devine and Horton in 1973¹. They classified

CPC into five main pathologic categories according to the defective layer around the urethra. The urethra is placed within the corpus urethrae (corpus spongiosum) and surrounded by Buck's fascia, dartos fascia and, finally, skin. In CPC type I all the layers around the urethra are defective while skin coverage around the tube is complete. In CPC type II maldevelopment of Buck's and dartos fascia from the mesenchyme results in the formation

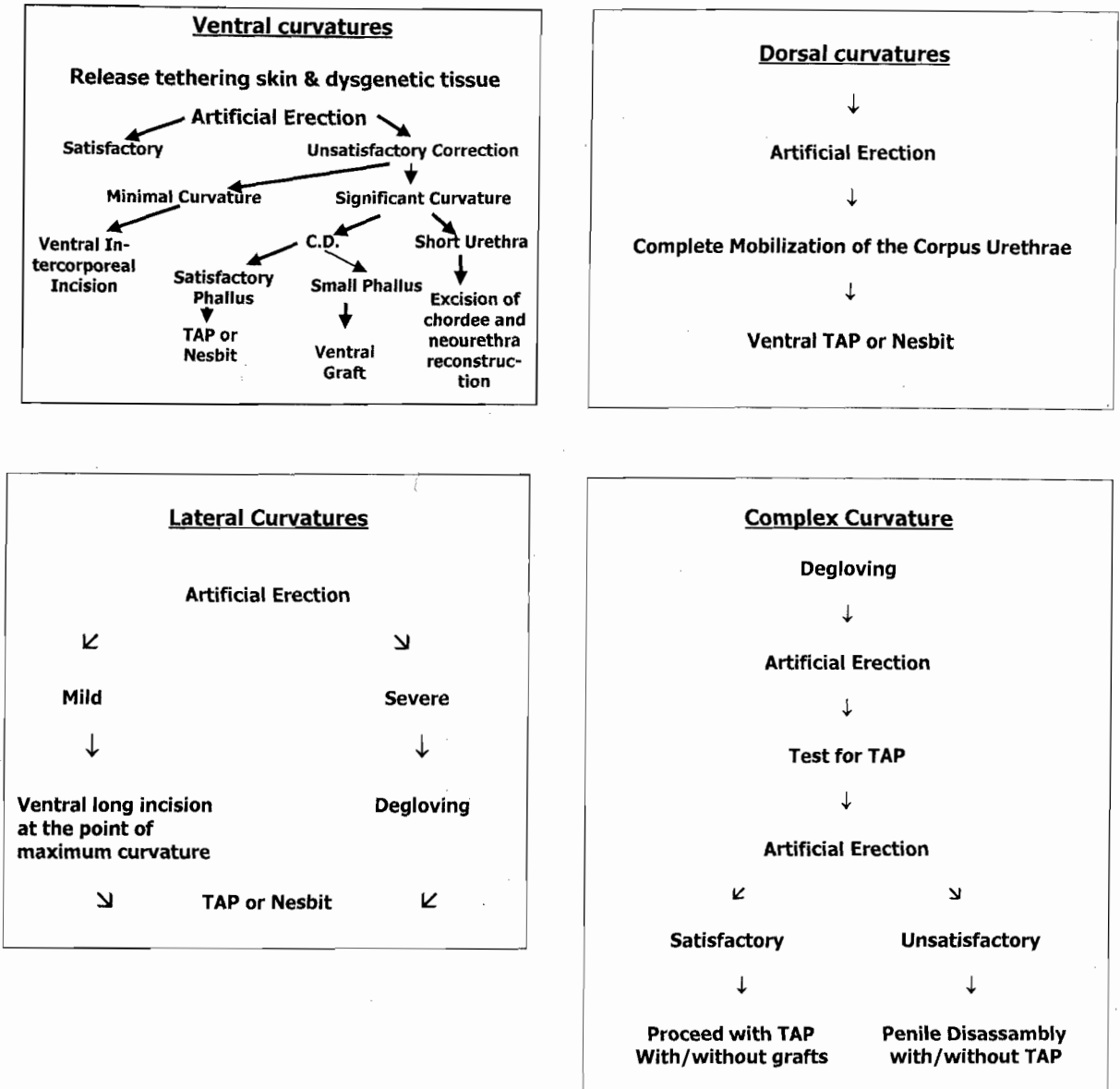


Fig. 1: Algorithms for the Management of congenital penile curvatures

of a dysgenetic band of fibrous tissue that causes the curvature. In CPC type III the defect is in the dartos fascia while the remaining layers surrounding the urethra are normal. This type is characterized by an inelastic dartos that often results in complex curvatures. In CPC type IV the defect is inelasticity of one aspect of the tunica albuginea with or without hypercompliance of the other. In other words, asymmetry in the compliance of the tunica is the cause of curvature in this type. In CPC type

V the defect is in the form of a congenitally short urethra while all other layers are normally developed.

The pathologic defects described in types I, II and III are those typically occurring with hypospadias. Consequently, congenital curvatures occurring in the presence of an orthotopic meatus are referred to as chordee without hypospadias. The other two pathologic entities

are referred to as such, i.e. corporeal disproportion and short urethra.

In this work we present a simple systematic approach towards the management of such cases.

PATIENTS AND METHODS

This work was conducted between 1993 and 2000 and included the management of 62 cases of CPC: these included lateral curvature in 14 cases, ventral curvature in 34 cases, dorsal curvature in 6 cases and complex curvature in 8 cases. The patients' age ranged from 8 to 31 years (mean 21.5 years).

For practical purposes we followed a logic stepwise approach in the management of CPC. We primarily categorized our patients into lateral, ventral, dorsal or complex curvature. Then, after artificial erection and exposure, each case was managed individually according to its pathological category (Fig. 1)

In cases presenting with ventral curvature (34 cases), we induced artificial erection and then started the procedure by degloving the penis and releasing the tethering skin (if present). Then excision of all the dysgenetic tissue was performed together with complete mobilization of the corpus spongiosum down to the penoscrotal junction. An artificial erection was performed at this stage; in 10 cases (~30%), this was sufficient to correct the curvature completely, while the curvature persisted in the remaining 24 cases. This persistence was due to corporeal disproportion in 20 cases (59%) and due to a short urethra in 4 cases (11%). Two (10%) of the patients with corporeal disproportion had a disproportion of minimal degree that could be corrected with a ventral longitudinal deep intercorporeal incision. The other 18 cases with significant corporeal disproportion were managed according to the size of the phallus. Fourteen (70%) had a satisfactory phallic size and were managed with Nesbit's procedure in 6 (30%) cases (Fig.2) and dorsal tunica albuginea plication (TAP) in 8 (40%) cases (Fig.3). Both situations necessitated mobilization of the neurovascular bundle (NVB). Four patients (20%) with ventral curvatures had a small phallus to which ventral grafts were applied. The ventral grafts were harvested from a non-hairy area in the groin in two (dermal grafts) and from the saphenous vein in the remaining two patients (venous grafts).

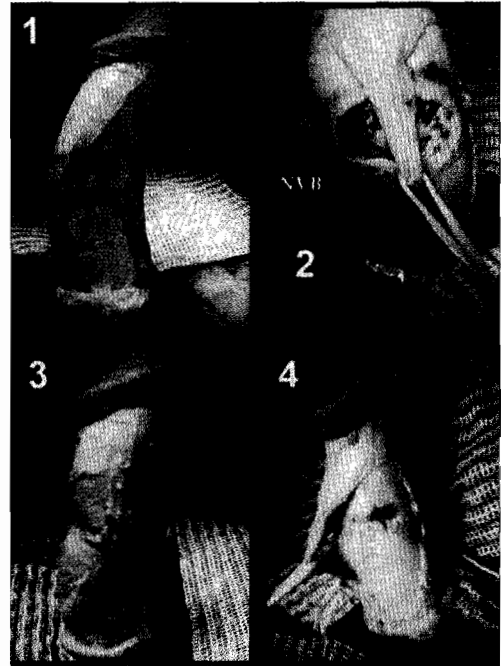


Fig. 2: Nesbit procedure for ventral CPC. (1) After penile degloving artificial erection discloses ventral penile curvature. (2) The neurovascular bundle is dissected off the tunica albuginea, and an ellipse of the dorsal tunica is excised. (3) The defect in the tunica is closed with continuous inverted 5-0 vicryl sutures. Artificial erection discloses straightening of the penis. (4) Another view at the end of the procedure.

The four patients with a short urethra were managed by excising the tethering corpus urethrae followed by artificial erection. This corrected the curvature in two patients while in the other two dorsal TAP was required. In all four cases neourethral reconstruction was performed using a transverse penile island flap tube in three and a transverse preputial island flap in the fourth.

Cases presenting with a lateral curvature (14 patients) were subjected to artificial erection to disclose the direction of the curvature (right or left). Exposure was either through a lateral longitudinal incision or penile degloving. These patients were managed by TAP in 10 cases (71%) and Nesbit's procedure in 4 cases (29%). None of these cases required mobilization of the NVB.

In cases presenting with dorsal curvature (6 cases), management consisted of degloving the penis, complete mobilization of the corpus urethrae and ventral Nesbit's procedure in four

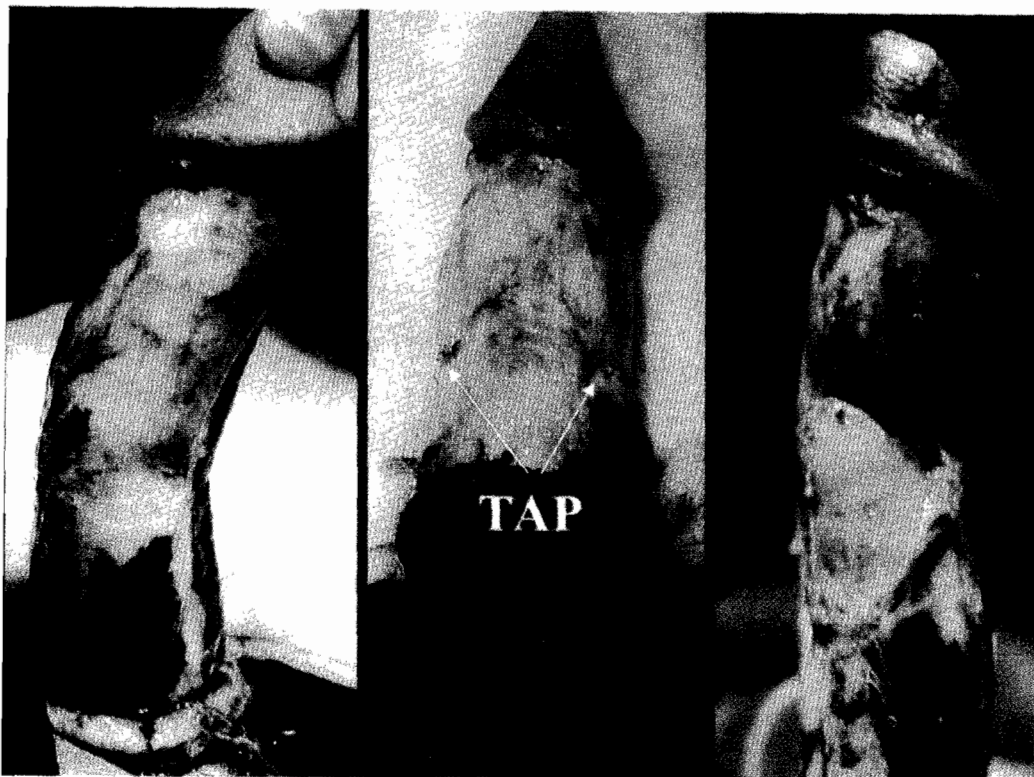


Fig. 3: TAP procedure for ventral CPC. A: After penile degloving artificial erection discloses a ventral penile curvature. B: Plication of the dorsal tunica on both sides of the midline is done using 5-0 prolene sutures. C: Artificial erection discloses straightening of the penis.

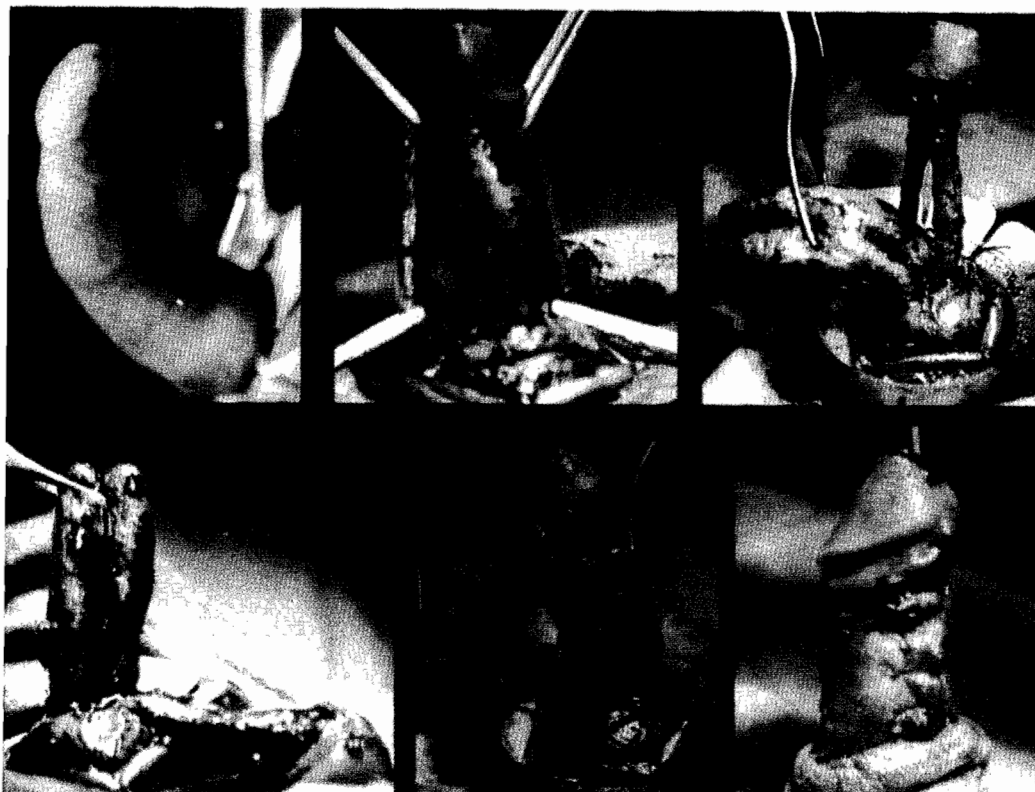


Fig. 4: Penile disassembly and TAP for complex CPC. This patient had a severe dorsolateral deformity. Penile disassembly together with sequential TAP corrected the deformity.

cases (67%) and ventral TAP in the remaining two (33%).

Finally, patients with a complex curvature (8 cases) were managed by degloving the penis and stepwise TAP on an individual basis according to the results of intraoperative artificial erection in 3 cases (37.5%), TAP in addition to dermal grafts in 2 (35%) cases and complete penile disassembly and TAP in 3 cases (37.5%) (Fig.4).

RESULTS

The follow-up period ranged from 6 months to 2 years and was based on a detailed questionnaire for each patient as well as an evaluation of artificial erection. Our results were satisfactory in the majority of patients. None of our patients developed impotence. Four patients (6.4%) who had undergone Nesbit's procedure had a penile haematoma that resolved spontaneously. Twelve patients (19%) experienced penile numbness that resolved after an average of 6 weeks in 10 and persisted in 2 (3%). Five patients (8%) felt a foreign body sensation (the knot of the prolene suture). None of our patients experienced painful erection beyond three months after operation. Only 6 patients (9.6%) had residual curvatures that required a second step (Nesbit's procedure) in two patients (3%), while four were satisfied with a mild ventral curvature and refused further intervention.

DISCUSSION

While abnormalities of the position of the urethral meatus are no longer considered to be uncommon, congenital erectile curvature without hypospadias or epispadias is still believed to be rare. In spite of that, the reported incidence of congenital curvature ranges between 0.3%² and 0.6%³. Yet it is our impression that the actual incidence might be higher than these figures.

In 1973, Devine and Horton classified congenital penile curvature into five categories according to the underlying pathology. These five categories were more practically summarized into three groups by Jordan et al.⁴, namely: chordee without hypospadias (categories I, II and III of Devine and Horton's classification), congenital penile curvature (class IV) and congenital short urethra (class

V) with the latter representing the least common form.

The diagnosis is simple and accurate but requires cooperation by the patient, and surgical treatment is indicated when the curvature is so severe that it interferes with sexual intercourse⁵.

In our work, the classification by Jordan et al. was the key to our stepwise approach in managing different cases where the aetiology dictated the management. Our patients with curvature due to tethering skin or dysgenetic tissue (category I) were simply managed by release and excision of the dysgenetic tissue, and this was successful in most of them. Any residual curvature necessitated minimal auxiliary procedures in the form of either ventral intercorporeal deep incision, TAP or Nesbit's plication.

Curvatures due to corporeal disproportion (category II) were managed according to the nature of the curvature, whether simple or complex. The simple curvatures were subjected to either TAP or Nesbit's procedure with possible ventral, dermal or venous grafts in cases of short phallus. On the other hand, the complex curvatures required the use of the penile disassembly technique with or without additional TAP.

Finally, in patients with curvatures due to short urethra (category III), neourethral reconstruction was performed with additional TAP in two patients.

Our follow-up period ranged from 6 months to two years, and we noticed no change in the outcome after 6 months. The use of the systematic approach resulted in satisfactory cosmetic and functional results in most of the patients with a low complication rate (9.6%). Complications were encountered in the form of residual curvature of which only 3% required re-operation. This low rate is comparable with the series of Leonard and Morales⁵ (successful results in 89%), Donahue et al.⁶ (8% complication rate) and Hendrix and Caesar⁷ (about 18% complication rate¹).

Minor postoperative complications that occurred in our patients included haematomas and penile numbness, and both resolved spontaneously (except for persistent numbness in two patients). A third minor complication was foreign body sensation in 8%,

which was not bothersome to the patients. Most of the minor complications occurred with the Nesbit's procedure, especially the haematoma and foreign body sensation, and this is in agreement with Popken et al.⁸ who reported 18% haematomas and 44% palpable indurations using the same procedure. We agree with Thiounn and colleagues⁹ that TAP is a simpler procedure than tunica albuginea resection (Nesbit's procedure) with a comparable success rate and minimal morbidity.

The penile disassembly technique seems to be the most effective procedure in selected cases of severe curvature of the distal penile shaft and a marked glans tilt. It may be helpful in patients with a small penis with curvature. As reported by Perovic and associates¹⁰, this procedure also provides the possibility of penile lengthening. During the procedure a space is created between the glans cap and the tips of the corpora cavernosa into which various tissues may be inserted to avoid penile shortening due to corporoplasty or even to lengthen the penis.

In conclusion, the management of congenital penile curvature can result in very high success rates depending upon good selection of cases for surgery, proper preoperative patient counseling, the utilization of a systematic stepwise approach and delicate handling of the tissue, especially the neurovascular bundle.

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RESUME

Prise en Charge de la Coudure Congénitale de Verge avec Méat Urétral Orthotopique : Approche Systématique.

Objectifs: Nous présentons notre expérience avec une approche systématique dans la prise en charge de la coudure congénitale de la verge. **Patients et Méthodes:** Entre 1993 et 2000, soixante deux cas de coudure congénitale de verge ont été pris en charge dans notre institution après une approche simplifiée. Nous avons d'abord commencé par une érection artificielle permettant d'apprécier le degré de coudure. La prise en charge dépendait ensuite des résultats de cette érection. Dix des 34 cas (30%) présentant une coudure ventrale avaient bénéficié d'une excision du tissu dysgénésique et d'une mobilisation complète du corps spongieux. Deux cas (6%) présentaient une disproportion minime des corps caverneux ayant bénéficié d'une incision inter caverneuse ventrale, longitudinale et profonde. Six cas (18%) avaient bénéficié d'une intervention de Nesbit et une plicature de l'albuginée du corps caverneux a été réalisée dans 8 cas (24%). Ces cas avaient nécessité une mobilisation du paquet vasculo-nerveux. Quatre patients (12%) avaient un petit pénis et avaient nécessité une greffe ventrale (2 greffes de peau et 2 greffes veineuses). Les 4 patients restant (12%) avaient un urètre

court qui avait bénéficié d'une excision des attaches de l'urètre et d'une reconstruction d'un néourètre. Les cas présentant une coudure latérale de la verge (14 patients) avaient bénéficié d'une incision longitudinale latérale au point de coudure maximale suivie d'une plicature de l'albuginée du corps caverneux dans 10 cas (71%) et d'une opération de Nesbit dans 4 cas (29%). Les coudures dorsales (6 cas) avaient bénéficié d'une opération de Nesbit ventrale dans 4 cas (67%) et d'une plicature de l'albuginée dans les 2 cas restant (33%). Les patients présentant une coudure complexe (8 cas) avaient bénéficié d'une plicature séquentielle de l'albuginée sur des bases individuelles suivant les résultats de l'érection artificielle peropératoire dans 5 cas (63%) et d'un désassemblage pénien complet et d'une plicature de l'albuginée dans 3 cas (37%). **Résultats:** La durée du suivi variait de 6 mois à 2 ans et les résultats étaient satisfaisants pour la majorité des patients. Aucun de nos patients n'avait présenté d'impotence. Un hématome pénien était survenu dans 6.4% des cas et un engourdissement pénien dans 19% des cas dont 3% persistant, tandis qu'une sensation de corps étranger était retrouvée dans 8% des cas. Aucun des patients n'a présenté d'érection douloureuse passés les 3 mois post-opératoires. Une coudure résiduelle a été notée dans 9.6% ce qui avait nécessité une nouvelle intervention de Nesbit dans seulement 3% des cas. **Conclusion:** La prise en charge de la coudure congénitale de verge peut donner un grand taux de réussite en cas d'approche par une démarche systématique et après un bon counselling préopératoire. Nous recommandons une utilisation limitée de la procédure de Nesbit à moins que la plicature de l'albuginée ne se solde par un échec, il faudra bien ménager le paquet vasculo-nerveux.

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