

# Penile lengthening

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**Objective** To describe a technique for penile lengthening and the results achieved.

**Patients and methods** The penis is completely disassembled into its anatomical parts; the glans cap remains attached dorsally to the neurovascular bundle and ventrally to the urethra and corporal bodies. A space is created between glans cap and the tip of corpora cavernosa; this space is used to insert autologous cartilage previously harvested from the rib, the space being measured beforehand when the corpora cavernosa are erect. The anatomical entities and inserted cartilage are joined together to form a longer penis. The increased length of the penis depends directly on the elasticity of the urethra and especially of the neurovascular bundle. From June 1995 to March 1999 the technique was applied in 19

patients aged 18–52 years, who were followed for a mean (range) of 3.3 (1–4.5) years.

**Results** The increase in penile length was moderate, at 2–4 cm; there were no injuries of the neurovascular bundle or urethra, and no erectile dysfunction. Fifteen patients reported painless sexual intercourse, the remaining four patients providing no data. During the follow-up the cartilage insert remained at about the same size as that at initial implantation.

**Conclusion** The penile disassembly technique combined with the interposition of rib cartilage in the space between the glans cap and tips of the corpora cavernosa provides a genuine increase in penile length, with satisfactory results.

**Keywords** penis, lengthening, rib cartilage, penile disassembly

## Introduction

New developments in penile enlargement surgery have generated great interest; although there are several techniques [1–3] for successfully enhancing penile girth, a genuine increase in length cannot be achieved with any present method. In recent years, we have used radical penile reconstructive surgery with an aggressive approach; this penile disassembly technique was used successfully in treating congenital penile anomalies [4,5]. We have now applied the penile disassembly technique to penile lengthening, and report our experience and results using this method to obtain genuine increases in penile length [6–8].

## Patients and methods

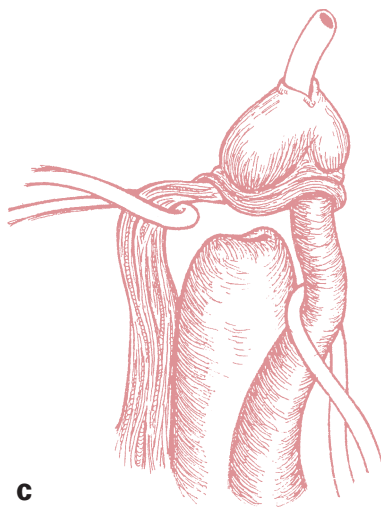
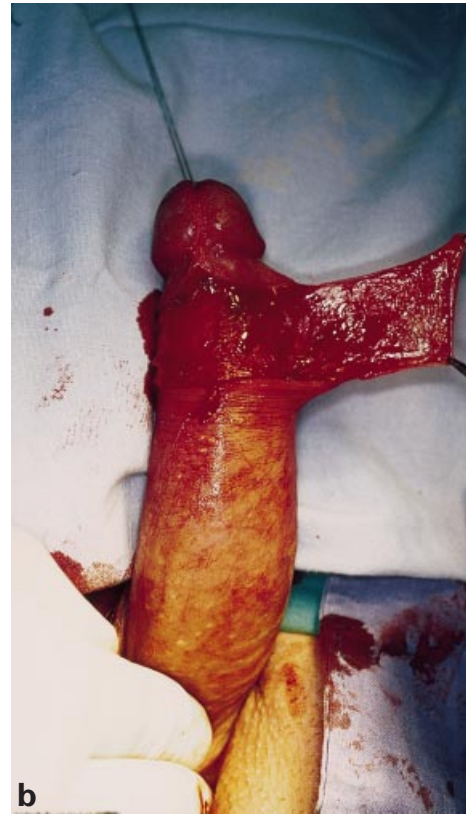
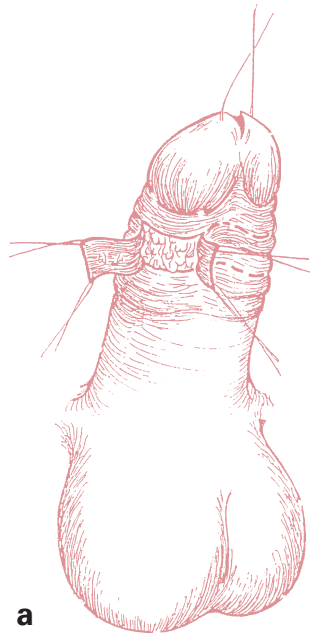
From June 1995 to March 1999 the technique was applied in 19 patients (mean age 29.4 years, range 18–52) whose penis was too short for satisfactory sexual intercourse (anatomically normal but 6–10 cm long when erect). The radical surgical approach was not considered in patients whose penis was >10 cm long. The preoperative evaluation included a detailed history

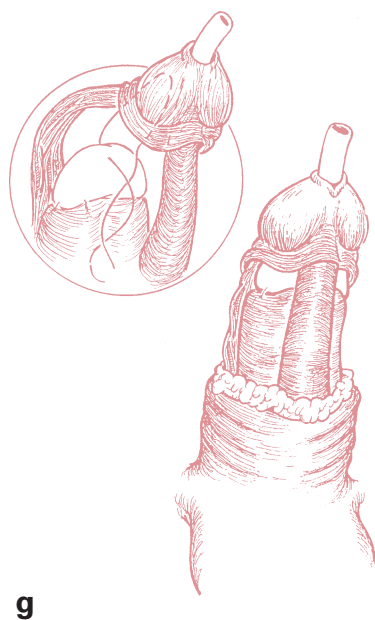
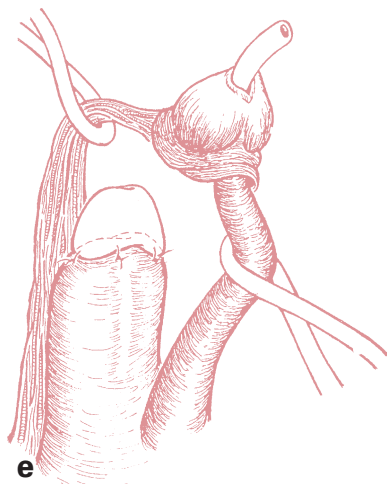
and physical examination, duplex Doppler ultrasonography, and dynamic cavernosometry and cavernosography with the injection of a vasoactive substance.

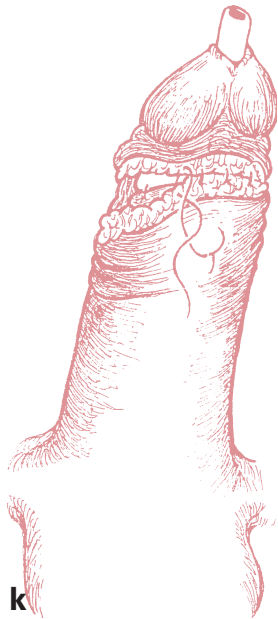
### *Operative technique*

The principle of penile disassembly involves the separation of the penis into its component parts; glans cap with the neurovascular bundle dorsally, together with the urethra ventrally and the corpora cavernosa. The technique begins with dissection of the urethra with its spongiosal tissue (Fig. 1a–d). The urethra is dissected from the corporal bodies, starting laterally in Buck's fascia. Proximally, the urethra is lifted together with Buck's fascia; this proximal dissection includes the bulbous part. As the distal urethra is wide, thin and adherent to the cavernosal bodies it is dissected laterally and as close as possible to the cavernosal bodies. The dissection is continued very close to the tunica albuginea, over the tips of corpora cavernosa towards the dorsum of the penis, underneath the neurovascular bundle and Buck's fascia. Special care is taken during glans dissection medially from the septum of the corpora cavernosa and laterally from the neurovascular bundle to avoid injury to the arteries that run lateroventrally. After the cavernosal bodies are completely separated from the

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glans cap with the urethra and neurovascular bundle, a space is created between the glans cap and tips of the corpora cavernosa. This space is used to insert autologous cartilage previously harvested from the rib (Fig. 1e,f). The space for this interposition is measured when the corpora cavernosa are erect (induced by PGE1). The cartilage is shaped and fixed to the tips of the corpora cavernosa and glans cap, using an absorbable suture at the site of the previous attachment of the glans cap and tips of the corpora cavernosa (Fig. 1g,h). The anatomical entities and inserted cartilage are joined together, forming a longer penis; the lengthening depends directly on the elasticity of the urethra, and especially of the neurovascular bundle. After lengthening the penis the penile entities are rejoined; the glans cap, urethra and neurovascular bundle are fixed to the corporal bodies (Fig. 1i,j). Vascularized penile subcutaneous tissue is used for additional covering of the cartilage, thus forming a vascularized bed to ensure survival of the cartilage (Fig. 1k,l). The surgery is completed by reconstructing the penile skin shaft. Drainage is placed under the glans cap along the penis and a compressive dressing applied, which is changed several hours after surgery. The technique can be combined with ligamentolysis and plasty of the penopubic angle. One month after surgery different penile stretch and vacuum devices are used for additional lengthening of the neurovascular bundle, to prevent penile curvature.

## Results

The patients were followed for a mean (range) of 3.3 (1–4.5) years. The increase in penile length was moderate, at 2–3 cm in 13 patients and 3–4 cm in the remaining six. (Table 1). There was no evidence of erosion, inflammation or infection of the site of cartilage implantation (Fig. 2). There were no injuries to the neurovascular bundle or urethra, and no erectile dysfunction. Sexual intercourse was resumed 3 months after surgery and was reported as painless in 15 patients, the remaining four patients providing no information. Moderate dorsal penile curvature occurred in five patients and was successfully resolved using penile stretch and vacuum devices. During the follow-up the

**Table 1** Initial and postoperative penile lengths (cm) in both the flaccid and erect state in 19 patients

Patient no.	Initial Flaccid	Erect	Follow-up Flaccid	Erect
1	4.7	9.8	7.5	13.4
2	3.2	7.9	6.1	10.8
3	3.6	8.4	6.4	11.2
4	4.6	9.9	8.2	14.0
5	2.9	6.4	5.8	9.3
6	3.3	7.6	5.9	10.2
7	3.9	8.7	7.2	11.5
8	4.1	9.4	7.5	13.1
9	3.7	8.2	6.3	10.6
10	2.8	6.2	5.5	9.0
11	3.2	7.9	5.7	10.6
12	2.9	6.9	5.9	9.7
13	4.5	9.8	8.0	13.4
14	4.7	10.0	7.8	13.8
15	3.4	8.1	6.0	10.8
16	3.5	8.4	5.8	11.0
17	4.3	9.6	7.7	13.5
18	2.6	6.7	5.6	9.4
19	3.1	8.0	6.2	10.9

cartilage remained at about the same size as when it was initially implanted.

## Discussion

Techniques for successfully increasing penile girth are based on using either the subcutaneous placement of different tissues (e.g. free fat, dermis graft, vascularized subcutaneous flaps [1,2]) or corpora cavernosal augmentation with saphenous grafts [3]. However, none produce genuine increases in length. The advancement of the penis by ligamentolysis does not produce genuine lengthening because the length of the penile structures remains the same; any increase in penile length is noticeable when flaccid but is minimal when erect.

The penile disassembly technique, which we have used successfully in treating congenital penile anomalies [4,5] and transsexual male-to-female surgery [9], enables genuine penile lengthening. The technique allows the complete separation of corpora cavernosa from the other

**Fig. 1. a, b** A double circumferential incision is made in the subglanular penis. Penile skin between these incisions is de-epithelialized and removed, whereas the subcutaneous tissue is preserved. This provides an increase in subglanular girth and a well-vascularized bed for the implant. **c, d** The penis is disassembled into its anatomical segments (glans cap with urethra, and neurovascular bundle and corpora cavernosa); **e, f** A space is created between the glans cap and the tips of the corpora cavernosa. Rib cartilage is shaped and sutured to the tips of the corpora cavernosa. **g, h** The rib cartilage is interposed between the tips of the corpora cavernosa and fixed to the glans cap at the site of the previous attachment of the glans cap and tips of the corpora cavernosa. (inset). **i, j** The penile components are reassembled; the mobilized urethra and neurovascular bundle are fixed to the corpora cavernosa. The cartilage is covered by the glans cap with urethra and neurovascular bundle. **k, l** The penile vascularized subcutaneous tissue also covers the cartilage, providing better vascularization; the penile skin is reconstructed as in circumcision.





Fig. 2. Two years after surgery, MRI shows vital cartilage inside the penis.

penile entities so that a space is created between the tips of the corpora cavernosa and the glans cap. This space can then be used to insert various tissues or materials (e.g. muscle flaps, cartilage, or a prosthesis) to lengthen the penis. Thus the normal penile structures, their anatomical relationships and the appearance of the penis are not disturbed. We prefer the use of the autologous rib cartilage, the length of which depends on the space for tissue interposition, measured when corpora cavernosa are erect. Rib cartilage is biocompatible, elastic and pressure-resistant; it resembles a natural penile prosthesis. Previously rib cartilage was used as a stiffener in patients with traumatic penile loss [10].

The survival of the cartilage depends on a well-vascularized recipient site. The present technique offers an excellent vascularized bed, created by the tips of the corpora cavernosa, glans cap, urethra, neurovascular bundle and penile vascularized subcutaneous tissue; the implanted cartilage obtains a blood supply from these surrounding host tissues. The long-term results showed that the cartilaginous structures maintained their size and shape after implantation. Experimental studies with cartilage rods as a potential material for penile reconstruction support the present results [11].

The penile lengthening was moderate (2–4 cm) because the length of the neurovascular bundle was limited. Also, dorsal penile curvature occurred during erection in some patients, but the use of penile stretch or

vacuum devices successfully resolved this problem. The inserted cartilage withstood the pressure of coitus with no erosion or inflammation; coitus was reported as painless. This satisfactory outcome is probably a result of the autologous cartilage and surrounding tissues forming a new anatomical unit. Thus genuine penile lengthening, using autologous rib cartilage, is feasible, but requires experience with penile disassembly; the benefits then outweigh the risks of the procedure.

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