

# Non-invasive methods of penile lengthening: fact or fiction?

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Penile size is a matter of great interest among men who are affected by 'short penis syndrome' or just believe themselves to have a small penis, even though the dimensions of the organ fall within the normal range. Surgical procedures of 'lengthening phalloplasty' lack standardized indications and carry a high risk of complications. Several non-invasive methods of penile lengthening have been described, such as vacuum devices, penile traction devices and penoscrotal rings; even 'physical exercises' have been popularized through the media. Most of these techniques, however, are not supported by any scientific evidence. We briefly analyse the efficacy and scientific background of such non-surgical methods of penile lengthening. It seems that penile extenders represent the only evidence-based

## What's known on the subject? and What does the study add?

Penile lengthening methods remain a controversial issue. Surgical procedures of "lengthening phalloplasty" are characterized by poorly defined indications and an unacceptably high rate of complications, as recently outlined by a literature review, while non-surgical techniques are largely popularized by the media but often lack scientific evidence. In the literature we found only ten articles/abstracts of studies pertaining to the topic of our review.

With our review, we aimed to explore whether non-surgical methods of penile lengthening may have some scientific background. We focused specifically on penile extenders, which among conservative methods are those whose efficacy is supported by some scientific evidence. It seems that penile traction devices should be proposed as the first-line treatment option for patients seeking a penile lengthening procedure.

technique of penile elongation. Results achieved do not seem to be inferior to surgery, making these traction devices an ideal first-line treatment option for patients seeking a penile lengthening procedure.

## KEYWORDS

penile lengthening, micropenis, small penis, dysmorphophobia, penile extenders, Peyronie

## INTRODUCTION

Penile size continues to represent a matter of great concern among men and an increasing number of patients seek urological advice for the so-called 'short penis', wondering if there is the possibility of having their penis enlarged. Notably, penile length is normal in most of these men who tend to overestimate normal phallic dimensions [1]. Furthermore, surgical procedures of 'lengthening phalloplasty' remain a controversial issue, being characterized by poorly defined indications and an unacceptably high rate of complications as recently outlined by a literature review [2]. In this brief overview we aim to explore whether non-surgical methods of penile lengthening, largely popularized through the media, may have some scientific background.

## MATERIALS AND METHODS

A literature search was conducted and focused on non-invasive methods of penile

lengthening. The PubMed, Ovid, Embase and Cochrane-Central Register of Controlled Trials databases were searched, using various combinations of the following free text: 'short penis', 'penile lengthening', 'Peyronie', 'extenders', 'micropenis', 'therapy', 'dysmorphophobia'. Identified articles were examined by the authors (M.O. and P.G.), and the most relevant articles were selected according to their levels of evidence, as defined by the Oxford Centre for Evidence-based Medicine [3]. In addition, abstracts presented at the 2008–2009 annual meetings of the EAU and the AUA were screened to identify relevant studies.

## RESULTS

Among the 154 reports matching our search terms, only 10 articles/abstracts of studies were found to pertain to the topic of the review. These clinical data were limited to case series (level of evidence 4 according to the Oxford Centre for Evidence-based Medicine

[3]) with none being a review article. Ten dealt with general concepts related to short penis, of which four were used to define the terms of the disease. The remaining reports addressed the role of surgery for penile enlargement ( $N = 5$ ), including a comprehensive review [2] which was kept for comparison with the results of conservative methods.

## NORMAL PENILE SIZE AND CONDITIONS OF SHORT PENIS

What is a normal penile size is a knotty question which some studies have tried to answer. Penile length has to be measured along the dorsal side of the penis, from the pubo-penile skin junction to the meatus, while the circumference is measured at the mid-shaft. According to Wessells *et al.* [4], normal penile dimensions should be considered to be any length within 2 SDs of the mean, that is  $>4$  cm for the flaccid state and  $>7.5$  cm for the stretched state.

Ponchiatti *et al.* [5] confirmed these findings, concluding that  $>4$  and  $>7$  cm, respectively for the flaccid and stretched states, represent the normal range, bearing in mind that these measurements have to be interpreted in the light of other variables, such as body mass index.

The main problem with patients who complain of 'short penis' and who request surgical correction is that they often overestimate 'normal' penile length [1]. They suffer from so-called 'dysmorphophobia', a condition consisting of an imaginary flaw in the physical appearance [6], in this case a false perception of inadequacy of the penis even though its dimensions fall within the normal range [7]. Dysmorphophobia can be an aesthetic issue, if the altered perception concerns the penis in its flaccid state, or functional, during erection [8]. In both cases, the psychological aspect should be the main concern and a multidisciplinary approach, comprising urological, psychosexual and psychological assessment, is advised [9]. A nomogram was developed to show to the patients how they compared with other men [5]. This tool was found to be very useful to reassure these patients: in a study by Mondaini *et al.* [1], 70% of their sample felt reassured after being educated about the normal variation in penile size and was no longer interested in undergoing a surgical procedure for penile enlargement.

Penile shortening is a phenomenon associated with several medical and surgical conditions, such as prostate cancer treated with radical prostatectomy, Peyronie's disease and congenital abnormalities. A significant reduction in penile length was recorded 3 months after radical retroperitoneal prostatectomy [10], although the aetiology is not clear. A statistically significant decrease in penile length was also found in men treated with hormonal suppression plus radiation [11]. One of the most common causes of penile shortening is represented by Peyronie's disease, an acquired penile deformity of the erect penis, caused by fibrous plaque. Both the natural history of the disease and the scarring process after surgical repair can cause a decrease in penile length [12]. Short penis can also be congenital, as a result of embryonic or developmental defects. Lastly, sometimes the shortness of the penis is the result of the so-called 'hidden penis' [13], a condition caused by obesity, aging with an overlying fold of abdominal fat and skin, and a shortage of

penile skin from chronic inflammation or an aggressive circumcision.

## NON-INVASIVE METHODS OF PENILE LENGTHENING: A NEW PERSPECTIVE

### VACUUM DEVICE

Vacuum devices are used as a treatment for erectile dysfunction. A recent study assessed the long-term effect of repeated vacuum treatment for penile elongation and concluded that there was no significant physical change after 6 months of therapy. Vacuum treatment of the penis was not found to be effective for penile elongation, although it provided some sort of psychological satisfaction for some men [14].

### PENILE EXTENDERS

Recently, great attention has been given to penile extenders, non-surgical devices that generate progressive mechanical traction to the penis. Although there are only a few well-conducted studies to assess their efficacy, it seems that these devices can produce an effective and durable lengthening of the penis, in both the flaccid and the stretched states [7]. In 2002, a small study by Colpi *et al.* [15] began to unveil the efficacy of penis-stretching physiotherapy in the 'small penis' treatment, showing a stretched penis augmentation of +1.8 cm (range +0.5 to +3.1 cm) after 4 months of use of a penis-stretcher device called Andropenis (Andromedical, S.L., Madrid, Spain) for at least 6 h/day. A recent prospective study [7] showed that, after 6 months of daily use of the same extender device for  $\geq 4$  h/day, there was a significant gain in length, of 2.3 and 1.7 cm for the flaccid and stretched penis, respectively, but no significant change in penile girth was detected. These findings were confirmed by another prospective study conducted by Nikoobakht *et al.* [16], who found a statistically significant increase in length, both for the flaccid and for the stretched state, after 3 months of use of the Golden Erect extender device (Ronas Tajhiz Teb, Tehran, Iran). This study also failed to show any significant change in penile girth, although it suggested the possibility of glans penis enhancement. Treatment with penile extenders is generally reported to be well-tolerated, although longer daily use would probably reduce patients' compliance [6,16], and the patients seem to be happy with the

outcome [6]. In conclusion, penile extenders appear to be an effective treatment for patients who complain of 'short penis'. The application of such devices can be recommended in all patients regardless of the penile length, because of the low risk of complications [16].

After promising results in the treatment of short penis, penile extenders have also been used in an attempt to correct the defect associated with Peyronie's disease. The first-line therapy of this disease is usually represented by conservative medical treatment, although there is little evidence that this is effective; alternatively, the surgical option must be considered once the disease has been stabilized [17]. In 2008, a non-controlled pilot study by Aberne and Levine [18] showed a trend toward improvement with intravesical verapamil injections plus penile traction therapy compared with injections alone. Another pilot study [19] suggested prolonged daily external penile traction therapy as a new approach for the non-surgical treatment of Peyronie's disease, with the rationale that chronic traction can cause soft tissue cellular proliferation, and eventually reduce penile curvature. This study actually showed curvature was reduced by  $10$ – $45^\circ$  after 6 months of use of the FastSize Penile extender (FastSize LLC, CA, USA). Stretched flaccid penile length increased 0.5–2.0 cm and erect girth 0.5–1.0 cm. These results, however, were only partially confirmed by a prospective study by Gontero *et al.* [17]. After 6 months of treatment with Andropenis, penile curvature improved only minimally, from an average of  $31^\circ$  to  $27^\circ$ , although a reasonable level of patient satisfaction was obtained: this was probably because of the increased mean stretched (1.3 cm) and flaccid (0.83 cm) penile lengths. The authors, however, explained that the particular selection of patients (stabilized disease, penile curvature  $<50^\circ$ , no severe erectile dysfunction) may have led to underestimation of the potential efficacy of the treatment [17].

### PENOSCROTAL RINGS

Other devices include penoscrotal rings that, in association with phosphodiesterase-5 inhibitors, might help to augment penile size and maintain erections in men suffering from anxiety [20]. To our knowledge, however, the efficacy of these devices has been described in only two case reports.

TABLE 1 Comparison between surgical and conservative methods of penile lengthening

Reference, year	Type of method	N	Mean age (years)	Mean follow-up (months)	Type of disease	Size gain		Side effects
						Flaccid (cm)	Stretched/Erect (cm)	
<b>Surgical</b>								
Austoni <i>et al.</i> [23] 2002	Dissection of suspensory ligament	18	24-47	9	Penile hypoplasia, dysmorphophobia	-	1.5-2.5	None serious
Spyropoulos <i>et al.</i> [8] 2005	Dissection of suspensory ligament	11	28	-	Penile dysmorphophobia	1.6 (1-2.3) (flaccid stretched)	-	None serious
Li <i>et al.</i> [24] 2006	Dissection of suspensory ligament	42	39	16	Penile dysmorphophobia, Peyronie's disease, micropenis, penile carcinoma, trauma	1.3 ± 0.9 (flaccid stretched)	-	Postoperative wound infection (n = 4), wound breakdown (n = 1)
Panfilov [25] 2006	Dissection of suspensory ligament	31	33.8	12	Not reported	2.42	-	None serious
Perovic and Djordjevic [26] 2000	Penile disassembly with autologous cartilage transplantation	19	29.4	3.3	Erect penis length of 6-10 cm	2-4	-	Moderate dorsal penile curvature (n = 5)
<b>NON-SURGICAL</b>								
Aghamir <i>et al.</i> [14] 2005	Vacuum device	37	24 (18-35)	8	Stretched penis length of <10 cm	-	0.3	Penis haematoma (n = 1), glans numbness (n = 1)
Colpi <i>et al.</i> [15] 2002	Penile extender (Andropenis®)	9	26-43	4	Small penis	-	1.8 (0.5-3.1)	None reported
Gontero <i>et al.</i> [7] 2008	Penile extender (Andropenis®)	15	45.7	6	Penile dysmorphophobia, hypoplastic penis, short penis due to penile surgery	2.3 (flaccid stretched)	1.7	Penile bruising (n = 1), temporary penile discoloration (n = 1), pain (n = 1)
Levine <i>et al.</i> [19] 2008	Penile extender (FastSize®)	10	56.4	6	Peyronie's disease	0.5-2 (flaccid stretched)	-	None reported
Gontero <i>et al.</i> [17] 2009	Penile extender (Andropenis®)	15	53.33	12	Peyronie's disease	0.83	1.3	Penile bruising (n = 2), itching (n = 1)
Nikoobakht <i>et al.</i> [16] 2009	Penile extender (Golden Erect®)	23	26.5	3	Short penis	1.7	1.7	None reported

## BOTULINUM TOXIN

A recent study by Shaer *et al.* [21] proposed injection of botulinum toxin as an alternative to surgery and penile extenders for alleviating penile retraction in patients suffering from short penis as a result of hyperactive retraction reflex. This preliminary report showed that botulinum toxin may have a potential effect in temporarily decreasing penile retractions, as well as improving flaccid length.

## PENILE LENGTHENING EXERCISES

In recent years, there have been many advertisements for non-invasive procedures that should increase penile size, taking advantage of the concerns of men with small penises. This is the case for 'penile lengthening exercises', a technique that in spite of the lack of any scientific evidence claims to represent an effective method to permanently stimulate penile lengthening by up to 3 inches (7.5 cm). Although this technique is not supported by any evidence, it is given great attention by patients, attracted by the idea of a non-invasive, low-cost method of having their penis enlarged. By way of example, if we search Google for the combination 'penile lengthening exercise', we can find up to 41 800 results!

## DO CONSERVATIVE METHODS PRODUCE PENILE GIRTH ENLARGEMENT?

Several surgical techniques have been perfected to obtain penile girth enlargement. Among conservative methods, it has been claimed that penile extenders can increase penile circumference by 0.6–1 cm/month [22]. It is not clear why these devices should be effective in enhancing penile girth; it has been hypothesized that chronic traction causes soft tissue cellular proliferation with tissue growth in a multiplanar fashion [19]. These findings, however, were not confirmed by a study by Gontero *et al.* [7], who found only negligible changes in penile girth after 6 months of traction therapy. Nikoobakht *et al.* [16] did not find significant changes in proximal penile circumference, either, although a significant difference was found in glans penile circumference. It is interesting, however, that no girth decrease was reported with traction therapy, as one would have instinctively thought.

## ARE CONSERVATIVE METHODS LESS EFFECTIVE THAN SURGERY?

No comparative studies have been conducted so far between surgical and conservative methods of penile lengthening. Reviewing the recent literature, however, it would seem that among non-invasive techniques penile extenders represent an effective and durable method of penile lengthening, capable of elongating the penis by an average of 1.5–2.5 cm, with minimal side effects. We should keep in mind, though, that published data on penile extenders are still limited to non-controlled case series. Further comparative studies should be performed to gain more evidence. Table 1 [7,8,14–17,19,23–26] shows the results of the main studies conducted on the techniques of penile lengthening.

## CONCLUSIONS

Despite demonstration of a normal-sized penis, a certain proportion of patients still request some sort of procedure to enlarge their 'under-estimated' penis [1]. Surgery, however, is characterized by a high risk of complications and unwanted outcomes, apart from the lack of consensus on indications and surgical techniques used [2]. All those things considered, a non-surgical approach should be attempted for those patients who persist in requesting treatment. Cognitive behavioural therapy can be useful in building confidence for those suffering from dysmorphophobia [6]. As for non-invasive physical treatments, various procedures have been attempted – vacuum devices, penile extenders, penoscrotal rings and botulinum toxin. Among these conservative methods of penile lengthening, penile traction devices are the technique for which the efficacy is supported by some scientific evidence. This is mainly generated by pilot studies with a prospective non-comparative design and further studies are needed. While the penis can effectively be elongated by an average of 1.5–2.5 cm based on the underlying condition, there is no evidence that the girth can be increased by applying traction forces. Taking into account that surgical methods are not supported by a better scientific background nor have they shown better results, penile traction devices should be proposed as a first-line treatment option for patients seeking a penile lengthening procedure. The same consideration may apply to Peyronie's disease where surgical correction of curvature carries

a high risk of patient dissatisfaction because of additional penile shortening. The current evidence suggests that selected cases may benefit from a conservative approach with penile traction devices.

In conclusion, level 4 evidence (according to the Oxford Centre for Evidence-based Medicine) suggests that penile extenders are effective minimally invasive methods of penile lengthening, although further studies, preferably comparative, should be performed to gain more scientific evidence.

## CONFLICT OF INTEREST

None declared.

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