BIPEDICLED SCROTAL MYOCUTANEOUS FLAP: A NEW TECHNIQUE FOR AUGMENTATION PHALLOPLASTY

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Purpose: To assess efficiency and safety of our new technique of "bipedicled scrotal myocutaneous flap" in penile girth enhancement in cases of small penis syndrome.

Patients and methods: This study was conducted on 23 patients complaining of small penile size who did not respond to psychiatric treatment. Patients with ambiguous genitalia, hypospadias and epispadias were excluded from this study. All patients were subjected to penile augmentation using the new technique of bipedicled scrotal myocutaneous flap to increase penile circumference and division of suspensory ligament for penile lengthening. The change in penile dimensions was assessed by preoperative and postoperative measurement of stretched penile length (SPL) and mid penile girth. Follow up of the patients was done at 3 months and 9 months postoperatively.

Results: No intra-operative complications occurred. At 3 months postoperatively, the mean increase in penile dimensions was 2.3±0.2 (1.9-2.7) cm and 2.0±0.3 (1.6-3.1) cm in penile girth and penile length respectively. The patients' satisfaction rate was 65.2%. Only 3 cases experienced delayed scrotal wound healing that was managed conservatively without late sequelea. On follow up the penile girth enhancement was symmetrical and durable. No other postoperative complications reported. No affection of penile erection, significant scarring nor long term affection of penile sensation occurred.

Conclusion: The technique of bipedicled scrotal myocutaneous flap is an easy and effective technique that provides a reasonable long term symmetrical increase in penile girth by using a well vascularised nearby flap. Moreover, it is a safe technique with no associated postoperative harmful sequelea.

INTRODUCTION
Throughout history, the penile size was a source of anxiety among men, influencing various social and psychological issues.1 The small penis syndrome (SPS) is defined as an anxiety about the genitals being observed, directly or indirectly (when clothed) because of concern that the flaccid penile length and/or girth is less than normal for an adult male, despite evidence from a clinical examination to counter this concern.2 It is considered as a part of body dysmorphic disorder (BDD). Individuals who suffered from "BDD” have major social and occupational dysfunctions. They are liable to develop social isolation and frequently suffer from recurrent attacks of severe depression.2

Nowadays, few techniques are reported for penile girth enhancement with variable results. With this background, we were encouraged to evaluate our technique "bipedicled scrotal myocutaneous flap” (BSM flap) as a method for penile girth enhancement.

PATIENTS AND METHODS
This study was conducted on 38 patients who came to the Urology Clinic of Ain Shams Specialized Hospital complaining of small penile size (length and girth) during the period from May 2005 till March 2008. Patients with ambiguous genitalia, hypospadias or epispadias were excluded from this study. All patients were subjected to detailed medical and sexual history and meticulous physical examination. SPL was measured for all patients as there is a good correlation between it and the erect length.3 SPL was measured by pulling the flaccid penis to its maximal distance with measurement of penile length on the dorsum beginning from the pubopenile junction to the tip of the glans.3 The penile circumference was also measured from the middle of the penile shaft. A true micropenis was defined as a penile size of more than 2.5 standard deviations (SD) below the mean values.2 It was suggested that any penis with a stretched length of less than 7 cm to be a true micropenis.3 None of our patients had a true micropenis yet all of them complained of small penile size as a part of BDD.

All patients were referred to the psychiatry department to offer them help. Only 23 patients, aged 22-45 years, who did not respond to psychiatric management and still insisted on performing surgery were subjected to penile augmentation. All patients were
consented for approval of surgery and possible outcome and complications.

Technique:
A subcoronal penile incision was done followed by a ventral midline penile incision that was extended into the scrotum for a distance equal to the penile length and returned upwards again to form a "U" shaped scrotal flap (fig.1). The scrotal skin on either side of the flap was undermined and partially dissected from the underlying scrotal dartos tissue. The dartos fascial flap was also dissected from the underlying tunica vaginals. Separation of the scrotal myocutaneous flap from the rest of the scrotal wall was done with preservation of the pedicle on each side (fig.2). Next, dissection of the penile skin and its fascia from the underlying Buck's fascia was performed. At this stage, penile lengthening could be done by pulling on the penis and cutting the suspensory and fundiform ligaments. Fixation of the new more proximal part of the tunica albuginea to the periosteum of the pubic bones by two vicryl 3-0 sutures was performed. The penis was withdrawn downwards to the ventral aspect of the flap by passing it between its two pedicles (fig.3 and 4). The myocutaneous scrotal flap was wrapped around the penis taking into consideration that the cutaneous part of the scrotal flap is placed on the ventral aspect of the midline of the penis (fig.5). The penile skin was sutured to the skin of the scrotal flap on each side (fig.6). Skin closure of the subcoronal and scrotal incisions was done. At the end of the operation, a small tube drain was left in the scrotum and an indwelling urethral catheter was fixed.

Fig. (1): The penile and scrotal incision.
Fig. (2): Dissection of the flap.

![Dissection of the flap](image)

Fig. (3): The penis is pulled downwards between flap’s pedicles.

Fig. (4): The penis is pulled to the ventral side of the flap.
Fig. (5): The flap’s cutaneous part is placed on the ventral aspect of the midline of the penis.

Fig. (6): The penile skin was sutured to the skin of the scrotal flap on each side.

Postoperatively, the drain was left for 24-48 hours. Postoperative penile stretch (5) was performed using penile weights for 10 days. The urethral catheter was removed 48 hours postoperatively. Postoperative care and follow up weekly in the first month then monthly thereafter were performed for all patients. Measurement of penile dimensions at 3 months postoperatively (after relief of penile edema) and again at 9 months postoperatively were performed. At each visit, examination of external genitalia for any scarring, disfigurement and penile curvature was performed. Personal interview with the patients was done to report any affection of penile sensation, erection or curvature. Patients were questioned directly as to whether they were satisfied with the surgical outcome, that is, (Are you satisfied with the outcome of your surgery?) and accordingly the satisfaction rate is estimated.

SPSS statistical software package (V.17.0, Echosoft Corp., USA, 2008) was used for data analysis. Data were expressed as mean±SD for quantitative measures and both number and percentage for categorized data. The comparison between two dependent groups for parametric data was done using paired t test. A p value of <0.05 was considered significant.

RESULTS
No intra-operative complications occurred. During early postoperative period, 3 cases experienced delayed scrotal wound healing.
that were managed conservatively and healing occurred within 10-14 days. Also, Mild penile numbness was experienced in all cases that resolved spontaneously 1-3 months postoperatively.

The mean preoperative penile girth and length were 8.27±0.3 cm and 10.7±0.61 cm respectively. At 3 months postoperatively, a significant increase in both penile dimensions was found. The mean increase in penile girth was 2.34±0.24 cm while the mean increase in penile length was 2.08±0.37cm (table1).

During follow up, the increase in penile size was found to be durable at 9 months postoperatively (table 3). The penile shaft showed a symmetrical increase in its circumference among all patients.

Table (1): Mean increase in penile size 3 months postoperatively.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>N</th>
<th>Preoperative</th>
<th>Postoperative (3months)</th>
<th>Mean increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girth (cm)</td>
<td>23</td>
<td>8.27±0.3</td>
<td>10.61±0.45</td>
<td>2.08±0.37cm</td>
</tr>
</tbody>
</table>
Table (2): Comparison of penile size at 3 and 9 months postoperatively.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>N.</th>
<th>Postoperative (3months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (cm)</td>
<td>23</td>
<td>10.7±0.61 (9.8-11.6)</td>
</tr>
<tr>
<td></td>
<td>12.79±0.93 (11.5-14.7)</td>
<td>2.08±0.37 (1.6-3.1)</td>
</tr>
<tr>
<td></td>
<td>-26.46</td>
<td>0.01*</td>
</tr>
</tbody>
</table>

*P< 0.05: significant
### Postoperative (9 months)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Girth (cm)</strong></td>
<td>23</td>
<td>10.57±0.45 (9.8-11.5)</td>
<td>10.61±0.45 (9.9-11.4)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length (cm)</strong></td>
<td>23</td>
<td>12.82±0.95 (11.4-14.5)</td>
<td>12.79±0.93 (11.5-14.7)</td>
</tr>
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</table>
Most of the patients were satisfied with the results. (65.2% satisfaction rate was recorded). Long term follow up did not reveal any significant scarring nor penile curvature. None of the patients experienced affection of penile erection nor penile stability.

DISCUSSION

Two important issues must be fulfilled preoperatively for treating patients with SPS. First of each is psychiatric assessment to exclude patients who will respond to psychiatric management. Second issue is to provide the patient with full knowledge about the expected postoperative penile size enhancement. This makes the patient realistic regarding the expected surgical outcome and prevents postoperative dissatisfaction or even disappointment.

Detachment of the suspensory ligament of the penis from the symphysis pubis allows forward movement of the corpora, thereby enabling the penis to extend closer to its erect length while flaccid.4 In the current study, division of the suspensory ligament of the penis with fixation of the new more proximal site of the tunica albuginea to the perisotum of the pubic bones combined with a postoperative penile traction provided an effective increase in penile length (2.34 ± 0.24 cm).

Many surgical methods for penile girth enhancement were described. Till now, no standard technique is available as every technique has its drawbacks. These techniques include autologous fat injection, dermal fat graft, silicon injection, venous graft implantation of corpora cavernosa and allografts.5,6 Vardi reported that autologous fat injection gave only a short term asymmetrical increase in penile girth due to reabsorption of the injected fat.1 Furthermore, affection of penile rigidity after injection of a large volume of fat, formation of nodules and penile curvature were reported by Alter and Jordan as complications of such a procedure.7

Dermal fat graft, although effective in increasing penile girth, has a high complication rate that includes persistent penile edema and induration, penile curvature and asymmetry due to fibrosis. Moreover, donor site scarring and deformity may occur.7

Penile silicon injection has also its drawbacks as reported by Wassermann and Greenwald in the form of distant migration, penile distortion and later granulomatous reactions.6 Furthermore, damage of penile blood vessels and nerves may occur resulting in loss of penile sensation and erectile dysfunction.9

Bilateral venous graft implantation of corpora cavernosa increases penile girth only during erection without affection of flaccid penile girth as reported by Austoni and colleagues.9 This technique is considered an invasive and aggressive procedure to treat cases with psychological SPS.10

Alloderm is an acellular inert dermal matrix derived from donated human skin tissue whose sheets can be placed over the Buck's fascia.11 The advantages of this technique include efficiency, minimal scar and no donor site scarring. However some complications were reported such as erosion, fibrosis, infection resorption and skin loss which can lead to a severe affection of penile length and function.7

In the current study, we found that the BSM flap technique can increase penile girth about 2.3±0.2 (1.9-2.7) cm which was considered a reasonable and satisfactory result for most cases (65.2%). We used a well vascularised bipedicled flap from a near site (scrotum) that can wrap the penis for 1.5 times thus a symmetrical increase in penile girth can be obtained. Moreover, at 9 months postoperatively, we found no change in penile dimensions compared to that at 3 months postoperatively. This indicates the long term effect of this technique as a result of the good blood supply of the bipedcled flap. Technically, we considered the BSM flap technique to be an easy procedure. Preservation of good vascularity for the flap and scrotal skin is essential for proper wound healing and successful outcome. Also this technique carries the advantage of leaving the corpora cavernosa intact.

During postoperative care and follow up, minor complications were observed in the form mild penile numbness that resolved spontaneously within 3 months postoperatively. Also, delayed scrotal wound healing was noticed in 3 cases that were managed conservatively with complete wound healing within 14 days. The latter complication was prevented in later cases by intra-operative trimming of the any ischemic scrotal skin before skin closure.

On examination, no significant scarring was noticed during follow up. Also, none of the patients reported affection of penile erection nor penile curvature which adds another proponent to this technique. So, we considered this technique to be a safe procedure as no intra-operative, significant postoperative nor late harmful sequelea occurred.
CONCLUSIONS
We found that bipedicled scrotal myocutaneous flap technique is an effective technique for penile girth enhancement. It has the advantages of being technically easy, using a well vascularized bipedicled flap to provide a symmetrical long term increase in penile girth. Moreover, it is a safe technique with no associated intra-operative nor significant postoperative complications.

REFERENCES


