

# Iatrogenic Trapped Penis in Adults: New, Simple 2-Stage Repair

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## Abbreviations and Acronyms

BMI = body mass index

Submitted for publication July 1, 2009.

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**Purpose:** We present a new, 2-stage functional and cosmetic reconstruction of concealed penis in adults with short-term subjective outcomes.

**Materials and Methods:** Patients with excess penile skin removal, shaft tissue scarring and penile retraction with poor functional and cosmetic results underwent 2-stage repair. At stage 1 after a coronal incision and penile degloving an intrascrotal tunnel was formed and the penis was transposed through the scrotum. Three or 4 zero or 2-zero nonresorbable sutures were applied ventral to the penis, crossing through the entire scrotum to ensure complete scrotal skin adhesion to the penis (penile scrotalization). At stage 2 after 6 to 12 weeks the scrotal skin at the penile base was incised bilaterally to separate the skin around the penis from the remaining scrotal skin (penile descrotalization). Evaluation was scheduled 3, 6 and 9 months postoperatively, and annually thereafter.

**Results:** Ten men with concealed penis underwent this 2-stage penile repair, including 8 who were circumcised and 2 who underwent conservative surgery for penile cancer. Mean  $\pm$  SD operative time was  $75 \pm 15$  minutes for stage 1 and  $45 \pm 10$  minutes for stage 2. No major intraoperative or perioperative complications occurred except superficial scrotal hematoma in 1 patient. At a median followup of 20 months (range 6 to 72) all men were in satisfactory clinical condition and the median patient satisfaction visual analog score was 97 (range 85 to 100). All patients recovered normal spontaneous erection with regular sexual intercourse 4 to 8 weeks after operation 2.

**Conclusions:** This simple, new 2-stage technique seems feasible and effective, and it is well accepted by patients. Further studies are mandatory to confirm preliminary results.

**Key Words:** penis, reconstructive surgical procedure, adipose tissue, cicatrix, adult

CONCEALED penis, a rare condition that can occur in patients of all ages, is most common in children or adolescents. Concealed penis in children is a much different condition with a different etiology than in adults, in whom it is due to over aggressive circumcision or penile cancer surgery. It is unclear whether children and adults may be compared. In this complex anatomical

abnormality the penis is completely or partially embedded inside prepubic fat and/or covered by scar tissue. The true incidence of concealed penis is currently impossible to establish since data are sparse and derived from sporadic observations at single centers.<sup>1</sup>

According to Maizels et al, who revised the now obsolete classifications by Keyes in 1919<sup>2</sup> and Campbell in

1951,<sup>3</sup> concealed penis consists of 3 subtypes, including buried, webbed and trapped penis with congenital micropenis considered separately.<sup>4</sup> Since there are various congenital or acquired and mainly iatrogenic causes, the etiology remains heterogeneous and different clinical pictures exist. Although rare, buried penis may create hygienic and mechanical difficulty with voiding and sexual activity, and psychological problems in patients and parents. In adults it generally appears after trauma or oncological surgery, or as the sequela of poorly performed genital organ surgery, of which the most common example is excessive penile skin removal during circumcision.

Since to date few children and adults have been described with this condition, surgical reconstructive experience is limited.<sup>5</sup> A lack of adequate local skin is a challenging problem for even the most skilled reconstructive surgeon. Several techniques using flaps or grafts have been proposed<sup>6–10</sup> but most are demanding and require full understanding of anatomy and surgical steps, which limits widespread use. We present a new 2-stage technique for functional and cosmetic reconstruction of buried penis in adults with a description of short-term subjective outcomes.

## MATERIALS AND METHODS

We have performed 2-stage surgery for concealed penis in adults since April 2002. In all patients penile surgery resulted in excessive penile skin removal, shaft tissue scarring and penile retraction with poor functional and cosmetic results. Study inclusion criteria were age greater than 18 years, a skin deficit after circumcision or conservative surgery for penile cancer, large elastic scrotal skin and no previous surgery at this site. Exclusion criteria were active penile cancer, penile dysmorphism (patient perception of an abnormal penis that is too small or too short when it is normal) and any condition that in our opinion may have increased risk, interfered with patient ability to provide informed consent or comply with followup, or confounded result interpretation. All operations were done at 2 tertiary urological departments by 2 surgeons (AZ and SP).

### Stage 1 Surgical Technique

As needed, pubic lipectomy or liposuction was done 15 days before surgery to reduce pubic fat. Liposuction was usually done preoperatively to decrease operative reconstructive time. Preoperative liposuction allowed us to observe cosmetic results in the prepubic area after liposuction and work in a more comfortable surgical area. The table lists BMI data. Three patients were obese (BMI greater than 30 kg/m<sup>2</sup>) so we performed liposuction due to excessive prepubic fat.

All surgery was done with the patient supine under general anesthesia. Coronal incision of penile skin was followed by removal of all scar tissue. Since penile skin is usually too short and consequently under traction, it tends to retract proximal to the pubis. Thus, we completely degloved the

### Patient demographics

Pt No.—Age*	BMI (kg/m <sup>2</sup> )	Etiology	Timing	Comorbidity	Sexual Activity
1—18	21	Circumcision	6 Mos	No	No
2—36	20	Circumcision	1 Yr	No	Yes
3—37	24	Circumcision	6 Mos	No	Yes
4—24	19	Circumcision	6 Mos	No	Yes
5—28	23	Circumcision	6 Mos	No	Yes
6—27	24	Circumcision	6 Mos	No	Yes
7—54	30	Circumcision	2 Yrs	No	Yes
8—65	35	Penile Ca	2 Yrs	Diabetes	Yes
9—61	21	Penile Ca	5 Yrs	No	Yes
10—35	34	Circumcision	6 Mos	Diabetes	Yes

\* No patient had dysuria.

penis, resulting in a large skin defect (part A of figure). Prostaglandin E1 (10 µg) ensured physiological erection for accurate measurement of the penile skin deficit. In 2 patients who had had penile cancer the penile suspensory ligament was sectioned for further lengthening and the corpora cavernosa tips were resurfaced with buccal mucosa grafts to create a neoglans. The 2 patients noted no subsequent problem with instability (buckling) of the erect penis during intercourse. A transverse incision was made in the lower part of the scrotum, an intrascrotal tunnel was formed, and wide separation of the dartos and skin was achieved to create space for the penis inside the scrotum. The penis was transposed through the scrotum and drawn through the second opening (part B of figure). Three or 4 nonresorbable zero or 2-zero sutures were applied ventral to the penis, crossing through the entire scrotum to ensure scrotal skin adhesion to the penis (penile scrotalization).

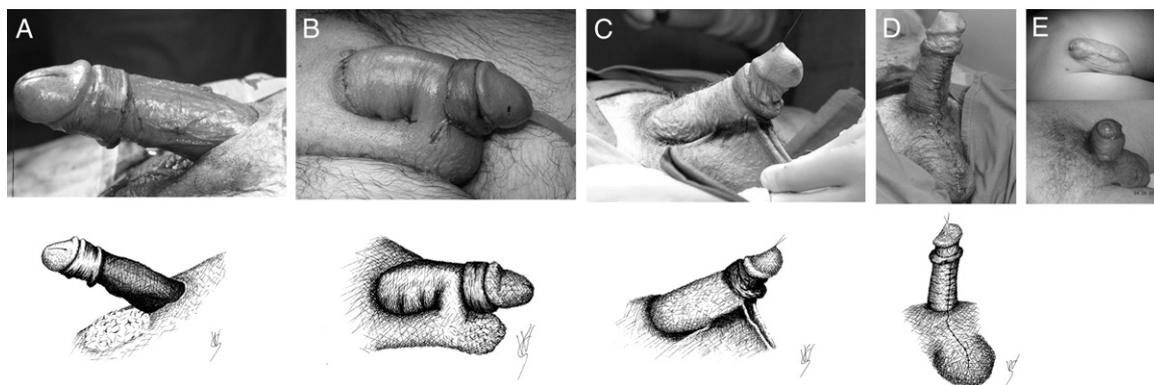
In 4 previously circumcised cases we left a cuff of penile distal skin for suture placement in scrotal skin but in these patients there were some problems due to lymphedema, according to the literature. Thus, we prefer to place a suture directly between scrotal skin and the preputial mucosa layer to avoid this problem.

### Stage 2 Surgical Technique

After 6 to 12 weeks the scrotal skin at the penile base was incised bilaterally, separating the skin around the penis from the remaining scrotal skin (penile descrotalization) (part C of figure). A longitudinal suture was made to close the scrotal skin defect (part D of figure). A slight compressive dressing was applied at the end of the operation and a bladder catheter was inserted.

Evaluation 3, 6 and 9 months postoperatively, and annually thereafter included a detailed uro-andrological history and clinical examination. An in-depth interview provided data on patient and partner satisfaction, and sexual activity. Patients indicated satisfaction with cosmesis on a visual analog scale of 0—worst to 100—best cosmesis expected by the patient. A graduated scale was reported on a preprinted paper and patients were asked to mark the value corresponding to satisfaction.

Our primary objective was technical feasibility and the secondary end point was to investigate cosmetic and functional voiding and sexual results. Since the study design precluded comparative tests, only descriptive statistical analysis was done.



A, after circular incision is made penile skin is too short and tends to retract proximal to pubis, creating large skin defect. B, penis is transposed through scrotum and drawn through second opening. Three or 4 nonreabsorbable zero or 2-zero sutures are applied ventral to penis, crossing through entire scrotum to ensure scrotal skin adhesion to penis for penile scrotalization. C, scrotal skin at penile base is bilaterally incised, separating skin around penis from remaining scrotal skin for penile descrotalization. D, longitudinal suture closes scrotal skin defect. E, final cosmesis in patient with previous partial penile resection for penile cancer.

## RESULTS

Between April 2002 and December 2008 we performed reconstructive surgery for trapped penis in 10 patients 18 to 65 years old (median age 35.5 years). The table lists demographic characteristics. Eight patients were circumcised and 2 had undergone surgery for penile carcinoma (distal penile resection). In the 4 weeks before surgery no patient had achieved sexual intercourse because the penis was completely embedded inside prepubic fat and covered by scar tissue. It was impossible to establish the real length of each penis. For this reason the International Index of Erectile Function was not administered preoperatively.

Mean  $\pm$  SD operative time was  $75 \pm 15$  minutes for operation 1 and  $45 \pm 10$  minutes for operation 2. No major intraoperative or perioperative complications occurred except superficial scrotal hematoma in 1 patient. Oral morbidity was negligible in 2 patients who underwent oral mucosal graft harvesting.

At a median followup of 20 months (range 6 to 72) all men were in satisfactory clinical condition. Cosmetic and functional results were good in all cases (part E of figure). The median visual analog scale score for patient satisfaction was 97 (range 85 to 100). The scar in the ventral side of the penis was the only cosmetic defect. Since the scrotal skin around the penis was so thick, the visual effect was good and sometimes patients considered it better than native skin.

All except 2 patients recovered normal spontaneous erection with regular sexual intercourse 4 weeks after operation 2. Time to recovery of complete function was 2 months in patients who had already undergone surgery for penile cancer because the buccal mucosa graft on the corpora cavernous tip and the urethral neomeatus needed a longer healing period.

Followup in these 2 patients showed no disease relapse.

In the interval between operations 1 and 2 all patients had voiding problems because the penis was scrotalized and directing the urinary flow was objectively difficult. All patients sat while voiding. No voiding problems were present in any patient after operation 2. All patients had discomfort during erection due to traction on scrotal skin and ventral suture lines.

## DISCUSSION

Concealed penis, a rare condition of the external genital organs, is due to obesity, congenital anatomical alterations or more frequently to acquired iatrogenic factors. The penis may have a normal anatomical structure but be embedded in excessive suprapubic fat or congenital fibrous dartos bands may lead to organ retraction or shortening and excess penile ventral skin may create a web that obscures the penoscrotal angle, resulting in penile scrotalization.<sup>11</sup> Poor skin adhesion at the base leads to sagging abdominal skin folds that may partially or completely cover the shaft. In addition to these anatomical abnormalities, penile surgery may trigger formation of a ring-like scar that traps the penis.<sup>12,13</sup> This usually occurs when too much penile skin is removed in normal males after surgery for cosmetic or oncological problems and in those with signs of concealed penis that were not recognized during the preoperative physical examination.

Indications of the age when the surgery should be done are gradually changing from mid to late childhood after growth leads to natural weight loss and greater penile size.<sup>4,14</sup> Today several reports emphasize the importance of treating patients as soon as possible since concealed penis may damage a child

socially and psychologically.<sup>2,15</sup> Surgical techniques commonly used individually or together include multiple Z-plasties,<sup>6,7</sup> dartos fascia incision when they cause penile retraction,<sup>14</sup> cutaneous and subcutaneous layer incision in cases of ventral webbing at the penoscrotal angle (penile scrotalization),<sup>8</sup> suprapubic skin fixation to the pubis to expose the dorsal penile skin as much as possible and accurately redefine the penile angle<sup>9</sup> full-thickness or split-thickness skin grafts, or island pedicled flaps of the foreskin or scrotum to correct large skin defects.<sup>10</sup> Cosmetic and functional outcomes are excellent in more than 80% of patients. Cosmesis is greatly improved by preoperative liposuction to remove suprapubic fat.

Since concealed penis is most common in children or adolescents<sup>16,17</sup> with diverse congenital or acquired anatomical conditions requiring different surgical approaches, the condition is fragmented into multiple subcategories that do not provide definitive indications for the diverse surgical procedures. Also, surgical techniques that are suitable in children with a small penis and abundant, extremely supple surrounding tissue are not always feasible in adults, in whom trapped penis is most likely due to trauma or an iatrogenic factor rather than to a congenital abnormality. Thus, the challenge is to treat adults with an iatrogenic trapped penis, poor residual penile skin and a large skin deficit that must be covered with an approach depending on residual penile skin and the extent of the skin deficit after degloving and induced erection. Since most proposed surgical techniques are difficult for a surgeon not skilled in plastic and reconstructive surgery, our rapid, easy approach seems to be a viable alternative, particularly in adults with a normal penile shaft. In complex cases, for example after partial penectomy for penile carcinoma, resectioning the sus-

pensory ligament and resurfacing the corpora cavernosa tip with a buccal mucosa graft has restored anatomical and functional integrity, and provided the patient with good cosmesis.

In our small experience with only 2 patients we had no problem with sectioning the suspensory ligament. However, we recommend informing the patient that sectioning the penile suspensory ligament may cause instability (buckling) of the erect penis during intercourse.

Unlike free or pedicled flaps, which generally result in a dorsal scar that is often associated with dyschromia, our technique leaves only a ventral scar with a minimal impact on penile appearance. The dartos and the scrotal wall fat provide the penis with a more consistent, natural appearance.

Despite the limitations of our study, including small sample size, heterogeneous pathological conditions, and the lack of preoperative clinical and subjective assessment of voiding and sexual function, our easy 2-stage repair provided excellent cosmetic and functional results. It may help surgeons with limited experience in the fields of plastic and reconstructive surgery.

Finally, this technique is not really good in morbidly obese patients. In this subset escutcheonectomy may be the best solution<sup>18</sup> but no patient with this condition was observed in our series.

## CONCLUSIONS

Trapped penis is an anatomical condition after penile surgery for congenital and acquired disease. Our new, simple 2-stage repair technique appears feasible and effective, and was well accepted by patients. Further studies are mandatory in a larger series with longer followup.

## REFERENCES

- Williams CP, Richardson BG and Bukowsky TP: Importance of identifying the inconspicuous penis: prevention of circumcision complications. *Urology* 2000; **56**: 140.
- Keyes EL Jr: Phimosis, paraphimosis, tumors of the penis. In: *Urology*. New York: Appleton 1919; chap 67, p 649.
- Campbell M: Embryology and anomalies of the urogenital tract. In: *Clinical Pediatric Urology*. Philadelphia: WB Saunders 1951; chap 3, p 273.
- Maizels M, Zaontz M and Donovan J: Surgical correction of the buried penis: description of a classification system and a technique to correct the disorder. *J Urol* 1986; **136**: 268.
- Shaer O and Shaer K: Revealing the buried penis in adults. *J Sex Med* 2009; **6**: 876.
- Glanz S: Adult congenital penile deformity. *Plast Reconstr Surg* 1968; **41**: 579.
- Kubota Y, Ishii N and Watanabe H: Buried penis: a surgical repair. *Urol Int* 1991; **46**: 61.
- Perlmutter AD and Chamberlain JW: Webbed penis without chordee. *J Urol* 1972; **107**: 320.
- Johnson JH: Other penile abnormalities. In: *Surgical Pediatric Urology*. Edited by HB Eckstein, R Hohenfellner and DI Williams. Philadelphia: WB Saunders 1977; chap 7.2, p 406.
- Gillet MD, Rathbun SR, Husmann DA et al: Split-thickness skin graft for the management of concealed penis. *J Urol* 2005; **173**: 579.
- Shepard GH, Wilson CS and Sallade RL: Webbed penis. *Plast Reconstr Surg* 1980; **66**: 453.
- Kon M: A rare complication following circumcision: the concealed penis. *J Urol* 1983; **130**: 573.
- Radhakrishnan BJ and Reys HM: Penoplasty for buried penis secondary to radical circumcision. *J Pediatr Surg* 1984; **19**: 629.
- Crawford S: Buried penis. *Br J Plast Surg* 1977; **30**: 96.
- Wollin M, Duffy PG and Malone PS: Buried penis. A novel approach. *Br J Urol* 1990; **65**: 97.
- Metcalfe PD and Rink RC: The concealed penis: management and outcomes. *Curr Opin Urol* 2005; **15**: 268.
- Selvaggi G and Elander A: Penile reconstruction/formation. *Curr Opin Urol* 2008; **18**: 589.
- Tang SH, Kamat D and Santucci RA: Modern management of adult-acquired buried penis. *Urology* 2008; **72**: 124.

## EDITORIAL COMMENTS

These authors describe a 2-stage technique to correct the difficult problem of concealed penis in the adult. Recent literature describes various 1-stage techniques to successfully repair the adult concealed penis, involving genital skin grafts and flaps, scrotoplasty, escutcheonectomy (suprapubic fat removal), penile adhesiolysis and penoscrotal junction anchoring (references 5 and 18 in article).<sup>1</sup> The ease of this 2-stage approach is appealing because of the limited dissection necessary, and the lack of reliance on potentially tenuous skin grafts and penile shaft anchoring techniques. The main issues with this approach, which require more

experience to adequately answer, include the level of patient satisfaction with the amount of hair on the penile shaft, sexual function after repair, patient selection parameters for this procedure, and the timing and use of perioperative liposuction. As the authors state, caution must be exercised with penile suspensory ligament sectioning due to the risk of penile instability with erection.

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## REFERENCE

1. Sugita Y, Ueoka K, Tagkagi S et al: A new technique of concealed penis repair. *J Urol, suppl.*, 2009; **182**: 1751.

These authors describe a technique to treat the child or adolescent with buried penis. It borrows from the extensive knowledge of plastic surgery of the authors and capitalizes on their comfort with using a wide variety of local tissue sources to achieve surgical goals. It offers an advantage over split-thickness skin grafts by providing supple, sensate skin coverage that includes deep tissue layers for a more natural look and feel. However, I am sure that this technique results in a hairy penis, and surgeon and patient must be aware of this fact beforehand. It will work well when buried penis is a cutaneous disease (a penis tethered beneath a skin layer only) but may not work well for adult buried penis with associated morbid obesity.

My adult patients with buried penis are usually obese and may have other complicating factors, such as lichen sclerosis or scrotal lymphedema. They almost always require multiple simultaneous interventions, as we described in 2008, including 1) penile unburying,

2) partial escutcheonectomy, 3) suprapubic fat pad defatting, 4) split-thickness skin grafts to cover the unburied penis and 5) sometimes partial scrotoplasty (reference 18 in article). Although these authors sometimes performed liposuction before their unburying technique, liposuction is not useful against the massive overhanging escutcheon (the tissue just above the genitals but below the actual abdominal pannus) or the massive scrotal lymphedema with which some of our obese adult patients with buried penis present.

The study confirms the requirement of removing all penile skin or risk lymphedema of the remaining distal skin.<sup>1</sup> The figure does not show this but the text confirms that it is important not to leave a distal skin cuff after penile skin removal.

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## REFERENCE

1. Morey AF, Meng MV and McAninch JW: Skin graft reconstruction of chronic genital lymphedema. *Urology* 1997; **50**: 423.