



# Out of place cylinders discovered in the postoperative period

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## Abstract

If the surgeon makes a flawed and unrecognized movement with an instrument during implantation surgery, the cylinder subsequently may migrate into an unexpected position with inflation and thrusting post operatively. The out of position cylinder is now evident to the patient or symptomatic with discomfort. This 5th Wilson's Workshop will describe our recommended surgeries for correction of out of place cylinders and illustrate the simplest, safest and least invasive.

We noted in the previous Wilson's Workshop #4 that cylinders could become out of place during the implantation surgery. We espoused two safety checks (the goal post and interrogation of the distal corpora) that the operator could use on each surgery to allow him to recognize the aberrant position and correct it intraoperatively. If the surgeon makes a flawed and unrecognized movement with an instrument and pierces a tissue plane, the cylinder subsequently may migrate into an unexpected position with inflation and thrusting post operatively. The out of position cylinder is now evident to the patient as either visible or painful. The client returns to his physician wishing a solution to the problem.

## Impending cylinder erosion

Impending cylinder erosion occurs when the cylinder has worked its way through the tough tunica albuginea and is:

- Under the skin in the distal penis
- Into the glans penis
- Impinging on the urethra at the meatus
- Palpable or visible in the perineum or buttock.

It is imperative to address impending cylinder erosion since, if left unchecked, it is inevitable the cylinder will erode through the tissue. The implant will become exposed and, by definition, will be infected (Fig. 1a, b). The clinician must be careful to distinguish impending cylinder erosion of a benign nature caused by technical error from a cylinder that is eroding because of underlying infection. This is easy to do since an infected implant will have other signs of infection such as pain, redness, induration and even drainage (Fig. 1c).

We believe the majority of impending cylinder erosions are due to inadvertent piercing of the tunica albuginea during the original implantation. There is no question, however, that vigorous, frequent, and enthusiastic sexual activity in unusual positions – the so called “cowboy sex” will also cause cylinder migration and ensuing out of place cylinder.

If a cylinder is discovered eroded through the skin or urethra months or years after the original surgery (Fig. 1) the entire device must be removed due to contamination of the device. The bacteria that contaminate the exposed cylinder will enter from the perforation and wick along the interconnected components contaminating the entire device. These are generally wimpy skin bacteria, so the patient may not appear infected at time of presentation. Nevertheless, our experience in these cases has been that removal of only the offending cylinder is invariably complicated months later by demonstrable infection of the remaining components. Rarely, in a favorable setting without a toxic infection, partial salvage may be attempted with placement of a solitary malleable on the non-eroded side after extensive washout. **IMPORTANT:** Erosion of an IPP component equals infection and must be treated with removal of all device components regardless of

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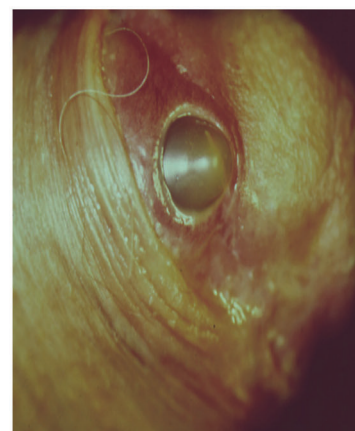
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A. Erosion into urethra

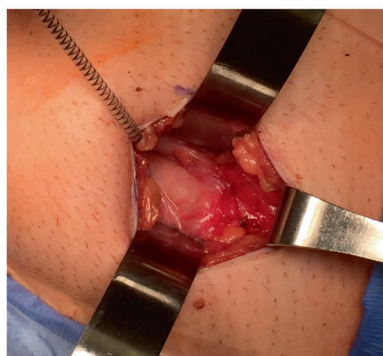


B. Erosion through penile skin

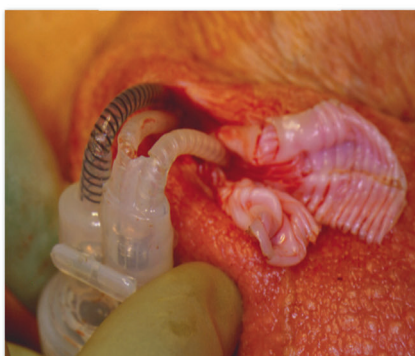


C. Infection erosion through glans hyperemia &amp; purulent drainage

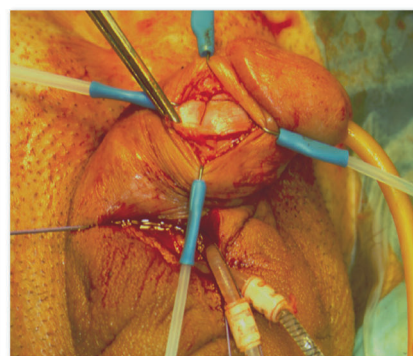
**Fig. 1 Erosion of cylinders.** **a** Erosion into urethra. **b** Erosion through penile skin. **c** Infection erosion through glans hyperemia & purulent drainage.



A. Reservoir capsule



B. Pump capsule



C. Cylinder capsule

**Fig. 2 Mulcahy's distal corporoplasty uses capsule.** **a** Reservoir capsule. **b** Pump capsule. **c** Cylinder capsule.

whether infection was the primary or secondary cause of the erosion.

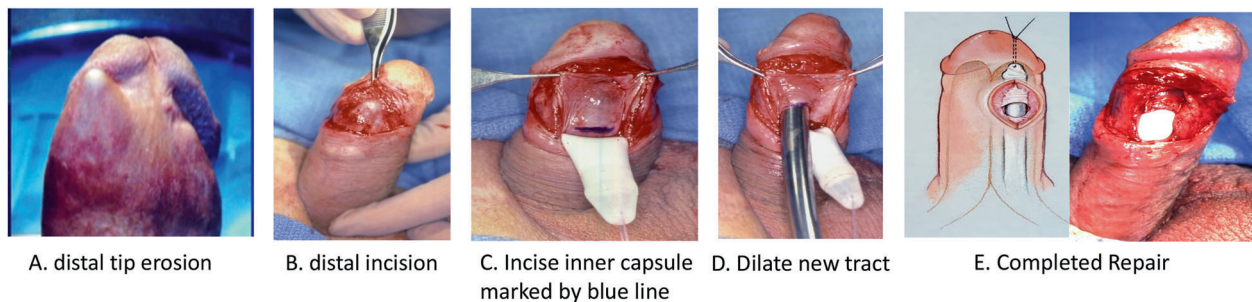
Surgical Correction of Impending Cylinder Erosion (video can be viewed at [www.vjpu-issm.info](http://www.vjpu-issm.info)) Wilson SK. *SST and Cylinder Erosion. VJPU 2014; 1: 039.* Ralph D. *Impending cylinder erosion. VJPU 2018; 2: 133.*

### Distal cylinder erosion

The repair was devised by Mulcahy in the late 90's and is still the gold standard for repairing impending cylinder erosion [1]. Even the occasional implanter can accomplish this repair if properly instructed in its technique. Mulcahy's distal corporoplasty uses two layers of the tough fibrous capsule (Fig. 2) that the body always creates to envelop implant components (read foreign body reaction). This repair with robust capsular tissue buttresses the cylinder tip and prevents repeat erosion. In our opinion, the repair is only suitable for inflatable cylinders. Mulcahy described the

repair originally as suitable for both rods and multi component implants but we have found, over time, the repair for rods broke down probably due to the mechanical pressure from constant rigidity.

The repair was originally described as only making an incision in the distal penis. The tunica and anterior capsule was incised, the cylinder deflated, and the cylinder tip removed from the capsular incision (Fig. 3a–c). The back wall of the capsule is then incised (Fig. 3c) and the scissors or dilator deployed to make a new resting place for the distal tip of the cylinder beneath the two layers of capsule (Fig. 3d). It is only necessary to dilate to 9 (the diameter of a Furlow) for insertion of any inflatable cylinder tips manufactured by Boston or Coloplast. The cylinder tip is then passed into the new tract with the Furlow insertion tool. If the same cylinder is to be used, a new guide suture can be created by passing a 00 Vicryl through the tip of the cylinder. The old erosion tract is obliterated by incorporating it in the corporotomy closure. When the repair is



**Fig. 3 Original Mulcahy illustrations for distal corporoplasty.** **a** Distal tip erosion. **b** Distal incision. **c** Incise inner capsule marked by blue line. **d** Dilate new tract. **e** Completed repair.

completed, the new cylinder tip location has two layers of tough capsule to prevent it from repeat mischief.

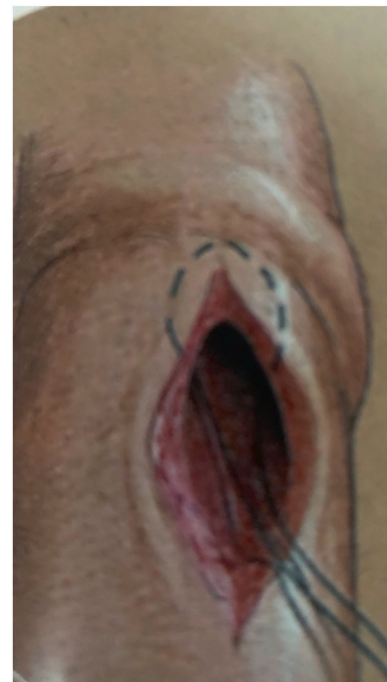
If the cylinder is impinging on the glans or urethra one additional step is necessary. The distal aberrant tract of the capsule is closed with a purse string of non-absorbable suture as a “belt and suspender” adjunct (Fig. 4). Then the identical rerouting of the cylinder tip (Fig. 3a–e) described in the preceding paragraph is performed through the interior wall of capsule.

Minimizing infection risk of the revision operation is of utmost importance. This natural tissue repair is favored over buttressing the defect with a graft for this reason. Since the original publication of the Mulcahy distal corporoplasty, we have learned the importance of sterile component exchange and wash out to substantially reduce the risk of device infection in revision surgery [2]. We prefer to remove the implant through a penoscrotal incision, wash out all the implant spaces with antiseptic solutions and make a separate incision on the distal penis to execute the corporoplasty. A new infection retardant coated implant is then placed with a Furlow entering the penis at the penoscrotal junction and traversing the distal incision in search of the new resting spot for the tip of the cylinder (Fig. 5). The patient may resume sexual intercourse in 60 days.

Antonini, Perito et al. recently described an enhanced Mulcahy repair by also suturing the distal tip of the out of place cylinder to the glans [3]. After creation of the proper intracorporal channel the tip of the cylinder is sewn to the end of the tunnel with 00 PDS suture. For extreme out of position cases (Fig. 6a), Herschorn described tying the two tips of the cylinders together after taking down the septum and bringing the contralateral cylinder into the operative field. The Furlow is fired through the contralateral glans causing a deliberate crossover [4] (Fig. 6b, c).

### Proximal cylinder erosion

An out of place proximal cylinder is very evident to the patient. His erection is diminished, his glans may be floppy with SST deformity (Fig. 7a) and/or the cylinder tip is



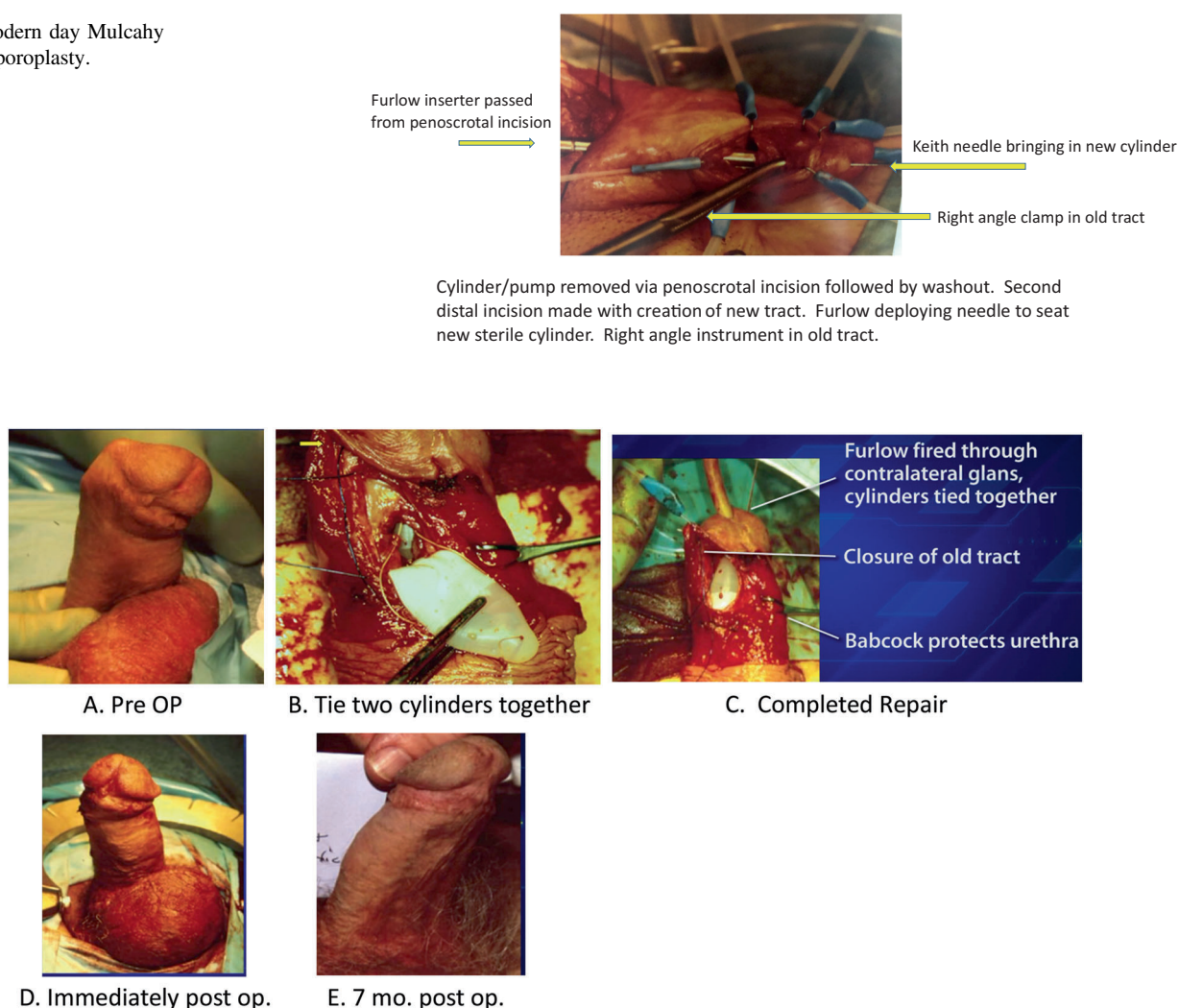
**Fig. 4** Additional suture if impending cylinder into urethra.

palpable in the shaft of the penis short of where it should be i.e., nestled beneath the glans. The etiology is either iatrogenic during the original implantation or weakened proximal corpora from corporal fibrosis and diminished blood supply which rupture with repetitive usage of the device (Fig. 7b).

The repair utilizes the RTE sling of non-absorbable suture combined with an adjunctive suture to obliterate the aberrant track. The adjunct is necessary because the cylinder base in the aberrant track has stimulated a capsule lining it and it will not scar over unless it is altered. This adjunctive repair requires complete exposure of the proximal corpora and taking down of the scrotal septum where it attaches to the urethra. If the perforation is unilateral, the surgeon measures based on where the non-perforated corpus ends proximally by placement of a



**Fig. 5** Modern day Mulcahy distal corporoplasty.



**Fig. 6** Transeptal corporoplasty. **a** Pre OP. **b** Tie two cylinders together. **c** Completed Repair. **d** Immediately post op. **e** 7 mo. post op.

dilator in the “good” side. Even though the perforation may be bilateral it is possible to ascertain where the corpora should attach to the ischial tuberosity by aiming a large diameter dilator cephalad and locating the shelf of bone. Then place 1 or 2 large Figure of eight 00 Vicryl sutures through the proximal corpus (or corpora if bilateral) of the perforated side. The placement of the sutures is not an exact science. Anywhere close to the crural insertion will do. These sutures obliterate the aberrant track’s lumen and the channel will subsequently scar closed. After deployment of the obliterative sutures construct a RTE sling in the usual fashion. Our experience has shown that unlike fixing an acute proximal perforation, a simple RTE sling is sometimes not enough – vigorous sexual activity may result in reoccurrence of the migrated cylinder because the capsule lined aberrant path did not disappear.

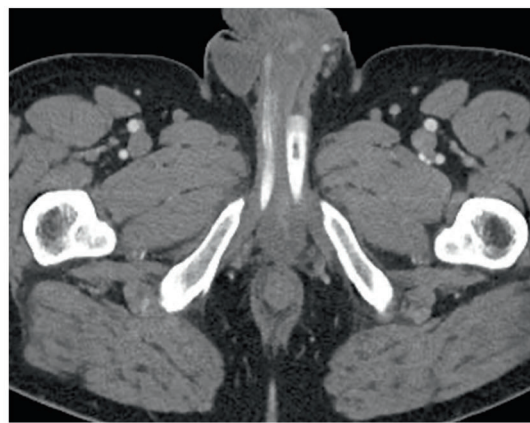
## Retrieving a displaced RTE

Nothing is more frustrating than losing a RTE during revision surgery. The interior of the proximal corpora is difficult to visualize and even more testing to visualize with a cystoscope and simultaneously use some form of grasper to remove the errant RTE. If you are a surgeon who exposes the proximal corpora routinely, it is straightforward to extend your corporotomy as much as necessary to visualize the RTE. If you have not cleaned the proximal corpora prior to corporotomy this is a very difficult dissection. Here is a trick we have utilized with great success to retrieve the retained RTE. Before probing with clamps, cystoscope or nasal speculum, fill the proximal corpus with irrigating fluid. Then insert an adult Yankauer Suction tip into the depths of the proximal crus. Both the disposable and metal Yankauer work for the extraction but the pediatric Yankauer

**Fig. 7 Pseudo SST from cylinders too short.** **a** Before: 16 cm cylinders & pseudo SST. **b** Before: Cylinders not in Crus. **c** Post op +5 cm: True corporal length 21 cm. **d** Post Op: cylinders deeper in proximal corpora.



**A. Before: 16cm cylinders & pseudo SST**



**B. Before: Cylinders not in Crus**



**C. Post op + 5cm: True corporal length 21cm**

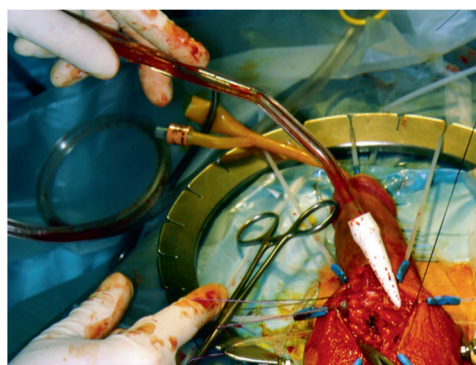


**D. Post Op: cylinders deeper in proximal corpora**

does not. Usually the RTE will appear stuck to the tip of the sucker upon withdrawal (Fig. 8).

## Delayed cylinder extrusion

Experienced implanters have experienced delayed partial or even total cylinder migration out the corporotomy into the surrounding scrotum following revision cases (Fig. 9). It may happen after a salvage washout revision surgery for infection. The infection has altered surgical planes and the tissues are fragile. Corporotomy sutures tend to pull through the tenuous inflamed tissue leaving an escape hatch for the newly implanted cylinder. Another common scenario is when the cylinder being revised was placed through a very proximal corporotomy. The incision into the corpus needed to retrieve the old cylinder must be quite deep to extract the widest portion of the cylinder – the interface of cylinder base and tubing. If corporal exposure is inadequate in the initial dissection, a large gap in a deep hole ensues which, in turn, causes



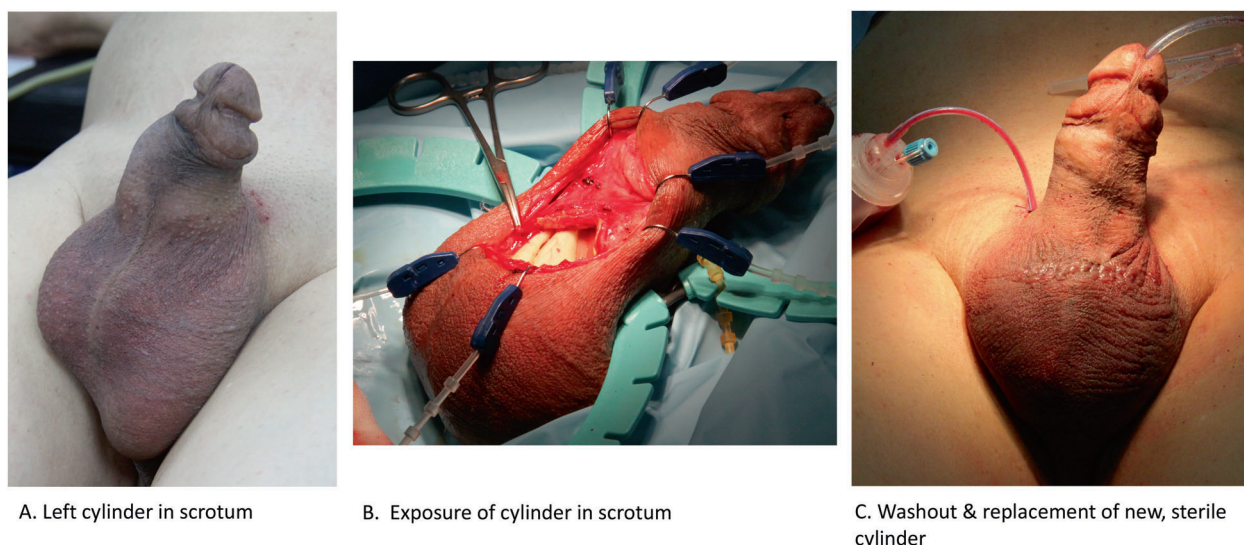
When RTE is lost, before instrument passage into corpus, fill with irrigation fluid and pass sucker tip to base

**Fig. 8 Retrieval of RTE with adult Yankauer suction tip.** When RTE is lost, before instrument passage into corpus, fill with irrigation fluid and pass sucker tip to base.

flawed closure of the true corpora/capsule and eventual cylinder extrusion.

In order to prevent the flawed closure that will result in cylinder extrusion, careful attention must be paid to the





**Fig. 9 Delayed Cylinder Extrusion.** **a** Left cylinder in scrotum. **b** Exposure of cylinder in scrotum. **c** Washout & replacement of new, sterile cylinder.

gaping corporotomy. Corporal dilatation must be repeated on the offending side as cases have occurred where inadequate creation of the corporal space caused the cylinder herniation upon usage. Another key step is the creation of clean corporotomy edges for the closure. If the breakdown of the corporal incision led to the extrusion the revision surgeon will note the capsule has formed over the edges of the corporotomy giving it a beveled look. This tissue must be incised circumferentially to expose the tunica edges and allow for a closure that will heal with less risk of recurrence. After checking the adequacy of the corporal space and cleaning up the corporotomy, it is advisable to washout the spaces and use new sterile components to decrease the risk of subsequent device infection [2].

## Conclusion

Cylinders becoming out of place in the postoperative period are usually the result of an intraoperative mishap during the original implantation surgery. Utilization of the twin safety checks – irrigation of the distal corpora and the goal post sign prior to cylinder placement should alert the careful surgeon to the possibility that corrective action may be necessary. It is our opinion that over 90% of cylinders out of position can be prevented by utilization of these safety checks. Surgeon intuition increases with experience. If something in the case seems awry, we retrace our steps to right the error to prevent a problem in the postoperative period. Of course, even the

most vigilant operator will still experience occasional cases where cylinder migration is caused from patient comorbidities or sexual activities. This 5th Wilson's Workshop has attempted to describe our recommended surgeries for correction of out of place cylinders and illustrate the simplest, safest and least invasive.

## Compliance with ethical standards

**Conflict of interest** SKW: Consultant AMT, Coloplast, International Medical Devices. Stockholder Neotract. Lecturer Boston Scientific. JP: Consultant Coloplast, Lecturer Boston Scientific. RC: Consultant Boston Scientific, Coloplast, Endo Pharmaceuticals, JS: Consultant Boston Scientific, Coloplast,

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