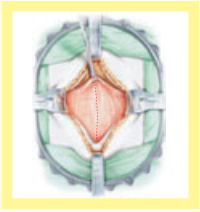
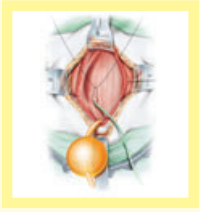
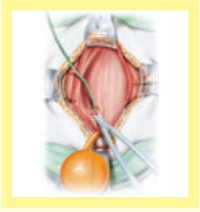
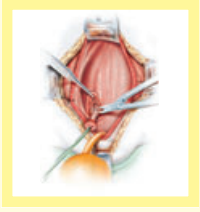
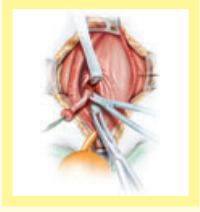
Surgery Illustrated











Surgical Atlas

Politano–Leadbetter ureteric reimplantation

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INTRODUCTION

The many antireflux procedures currently in use have a success rate of 95% [1]; they all attempt to create a submucosal tunnel which is four times longer than the width of the ureter being reimplanted. Of the many intra- and extravesical techniques in use, the Politano-Leadbetter, Lich-Gregoir and Cohen have gained the greatest popularity over the past four decades [2–5].

The Politano-Leadbetter reimplantation is technically somewhat more complex and difficult than, e.g. the extravesical Lich-Gregoir procedure [2,5], in which the submucosal tunnel is created superior to the ureteric orifice. It is also more complex than the Cohen procedure, which lengthens the ureter across the bladder base to the opposite side. This latter procedure has the distinct disadvantage of making future transurethral endourological cannulation and stone manipulation virtually impossible. However, the Politano-Leadbetter procedure recreates the new ureteric orifice in a normal anatomical position, allowing ureteroscopic procedures in adulthood.

Orthotopic reimplantation coupled with an easily catheterizable neo-orifice makes the Politano-Leadbetter procedure a safe and more standardized operation, with an acceptable complication rate [7]. There is also the ability to re-implant bilaterally without adversely affecting bladder function. In our 30-year experience, a third of patients required bilateral reimplantation, that can be accomplished at one surgical sitting with one anaesthetic procedure [6]. This is in contradistinction to the Lich-Gregoir extravesical procedure where, because of potential injury to pelvic nerves and resultant bladder emptying neurogenicity, separate operations are recommended [5].

INDICATIONS

- Uncomplicated vesico-renal reflux grade II–V.
- Before puberty in undilated single or double systems.
- Bilateral reflux.

LIMITATIONS AND RISKS

- Kidney function: MAG 3 clearance >20%.
- No risk of postoperative voiding dysfunction when the extravesical preparation is made close to the ureter in the layer of the meso-ureter, to avoid damage to the afferent nerve fibres [8].

CONTRAINDICATIONS

The procedure is contraindicated after puberty and in megaureters.

PREOPERATIVE DIAGNOSTIC PROCEDURES

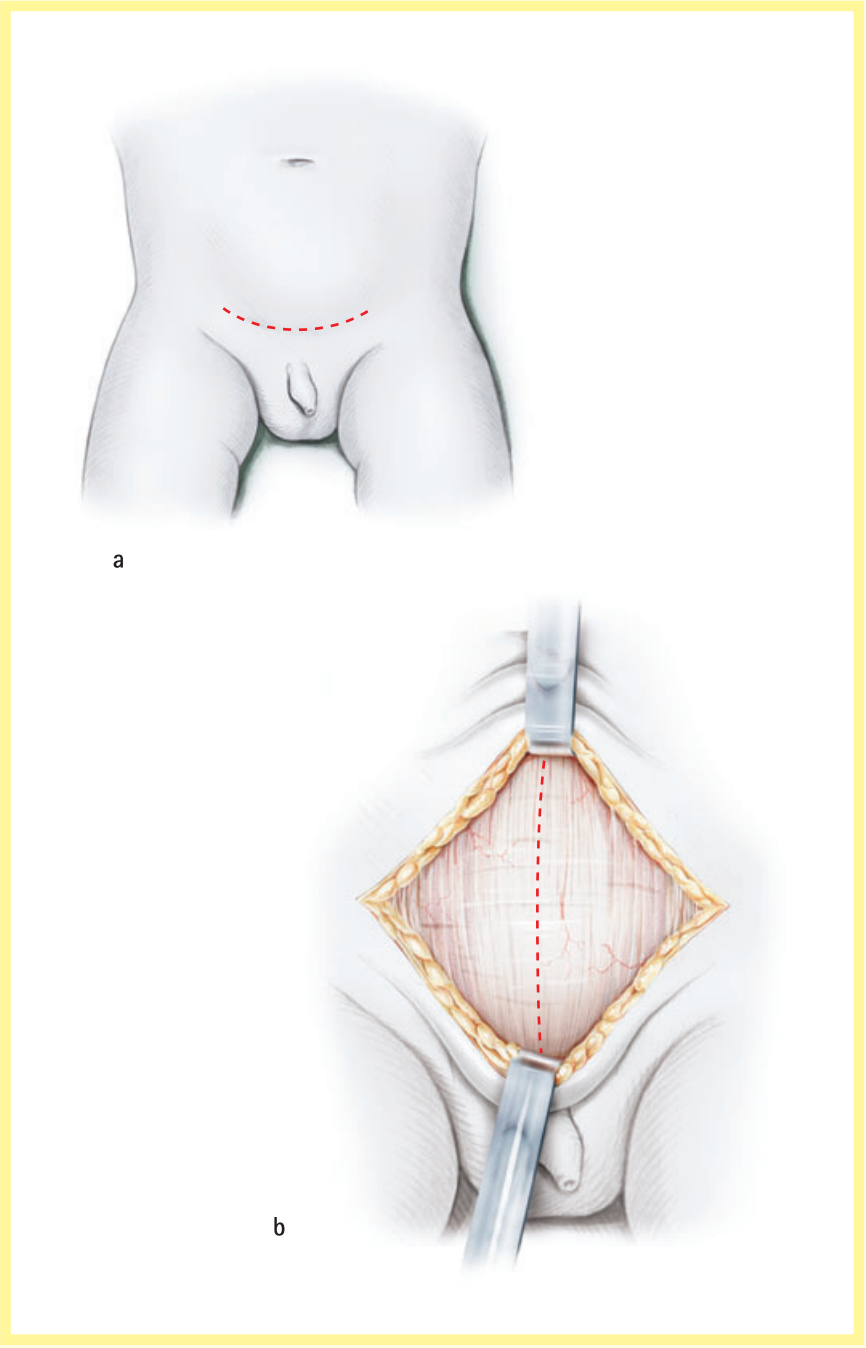
- Urine culture.
- Kidney and bladder ultrasonography, exclusion of residual urine.
- Voiding cystogram.
- MAG 3 clearance.
- Exclude ureteric obstruction.

MATERIALS

- Fine instruments.
- Bipolar coagulation.
- Magnification lens system.
- Bladder dome stay sutures: 3/0 polyglactin.
- Ureteric stent: 4–6 F.
- Ureteric orifice stay suture/stent fixation: 3/0 polyglactin.
- Free suture as a 'guide rail' for ureteric transposition through the neo-hiatus: 2/0 polyglactin.
- Bladder wall closure: 2/0 polyglactin.
- Ureteric implantation: 5/0 and 6/0 poliglecaprone 25.
- Mucosal stent fixation: 3/0 polyglactin rapid.
- Bladder dome closure: 3/0 polyglactin.
- Subcutaneous analgesic infiltration: <25 kg body weight; marcain 0.25%, 0.2 mL/kg body weight; >25 kg 0.5%, 0.1 mL/kg body weight.
- Skin closure: intracutaneous running suture: 4/0 poliglecaprone 25.
- Cutaneous stent and cystostomy fixation: 3/0 polyamide-6.

Figure 1

Pfannenstiel incision. Longitudinal incision of rectus fascia.



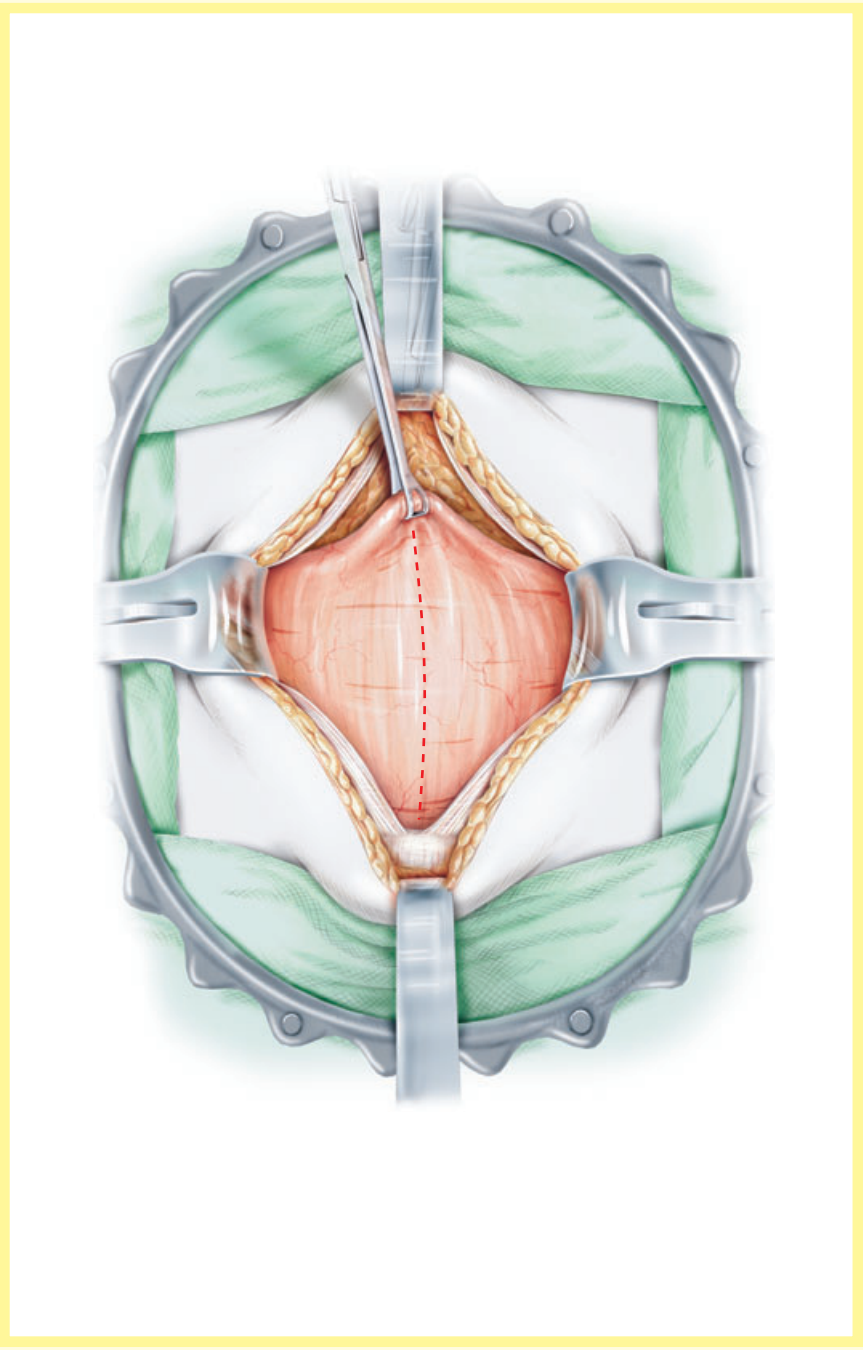
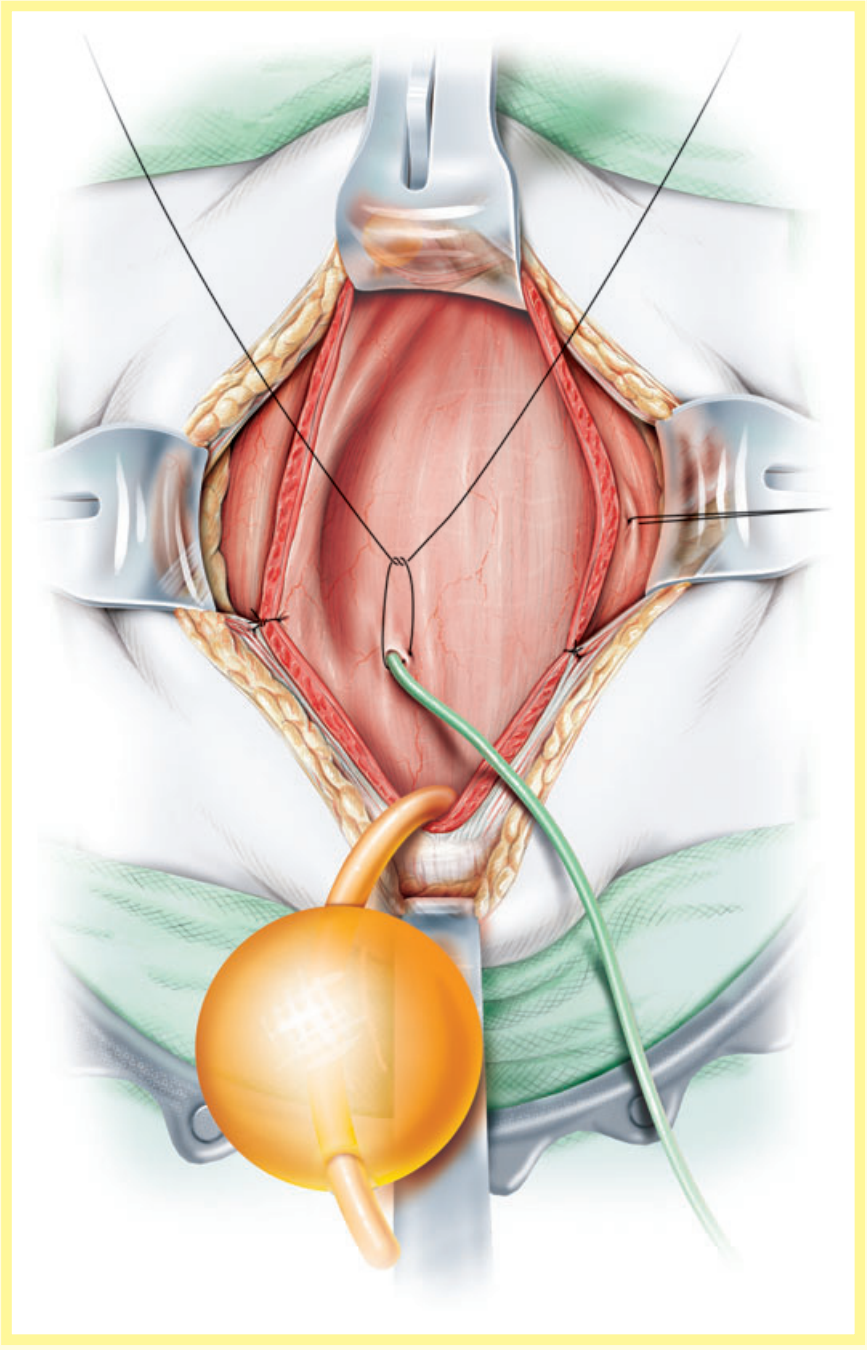


Figure 2

Longitudinal bladder dome incision.

Figure 3

Bilateral fixation of the bladder wall at rectus fascia. Insertion and fixation of an ureteric stent.



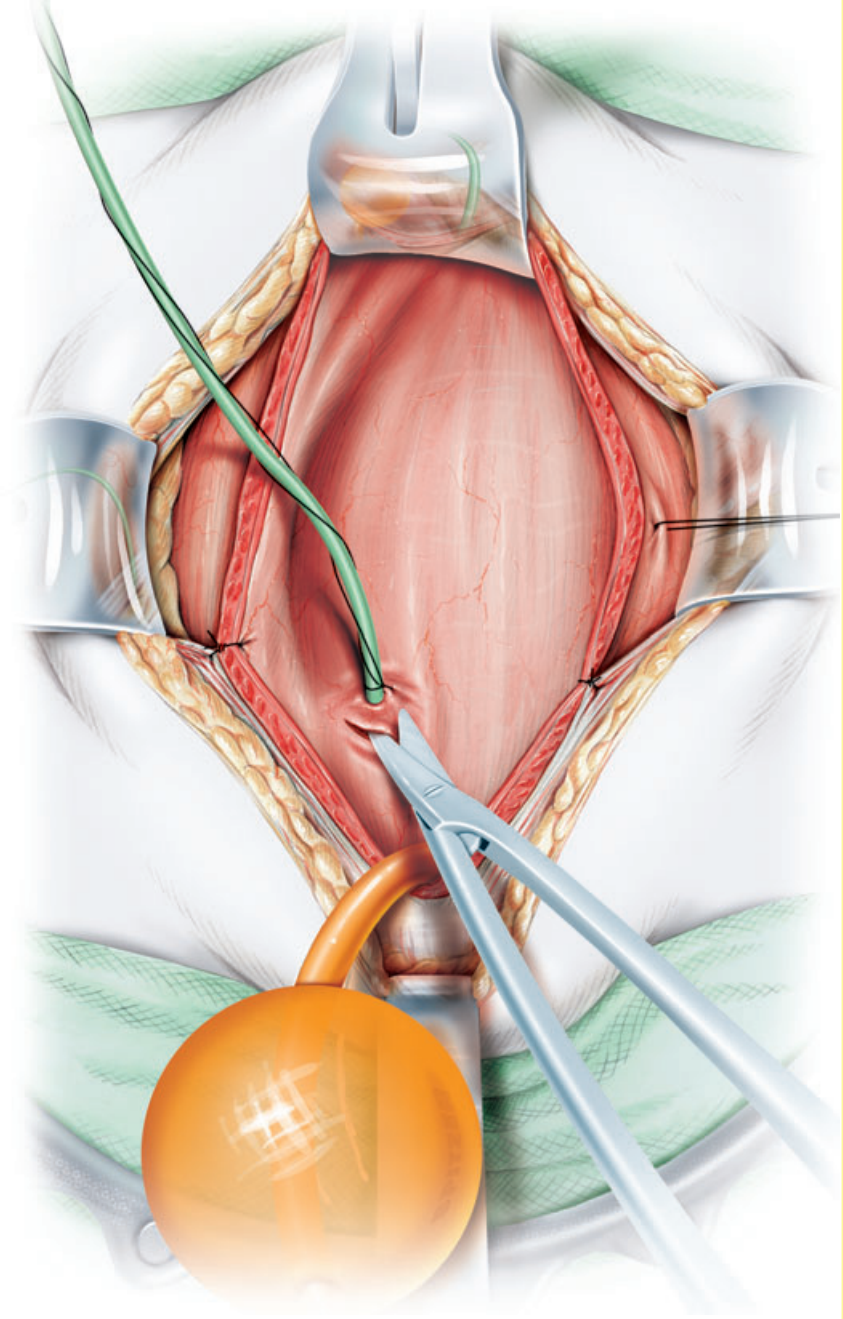
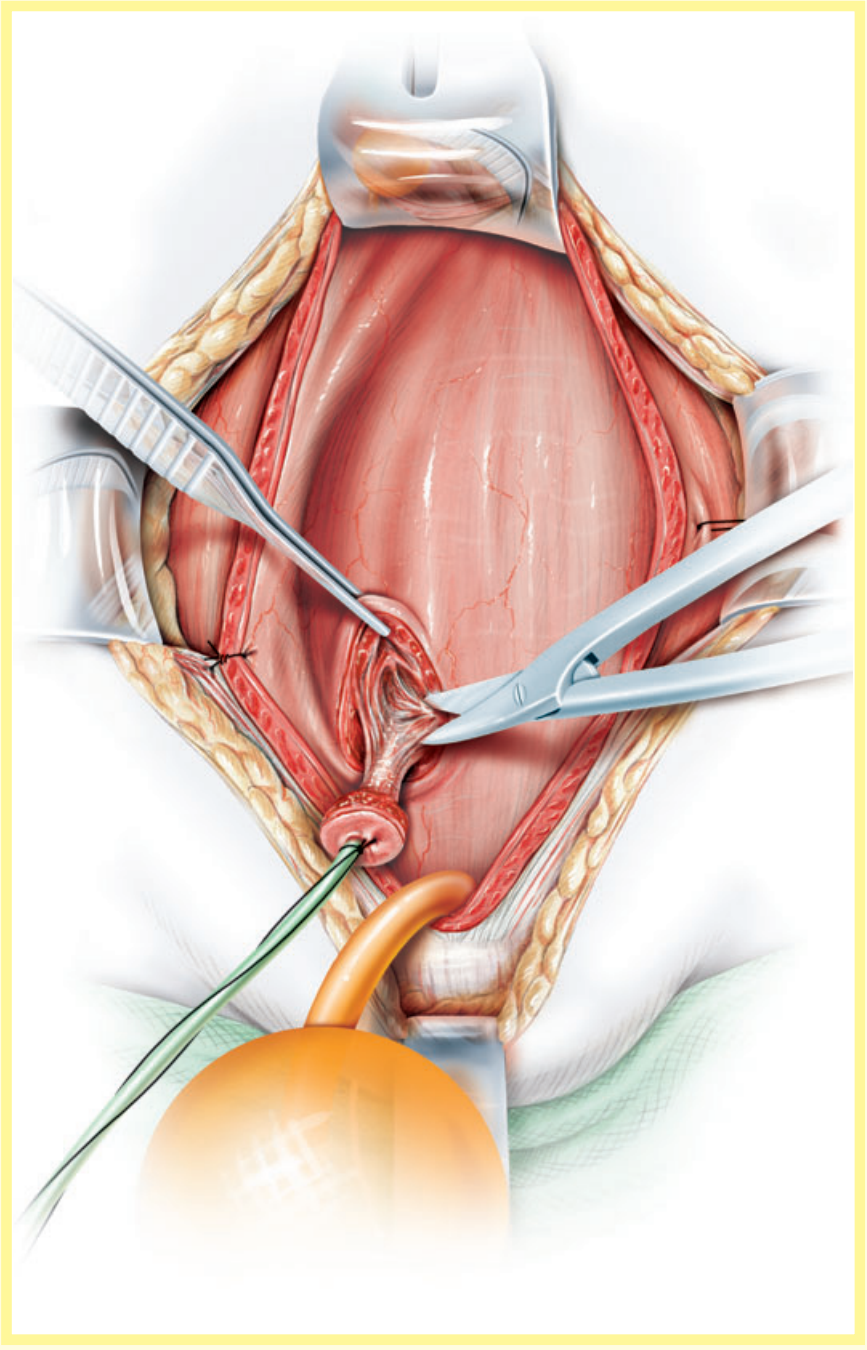


Figure 4

Circumferential incision of the ureteric orifice.

Figure 5

Distal ureterolysis; the preparation is made close to the ureter in the layer of the meso-ureter.



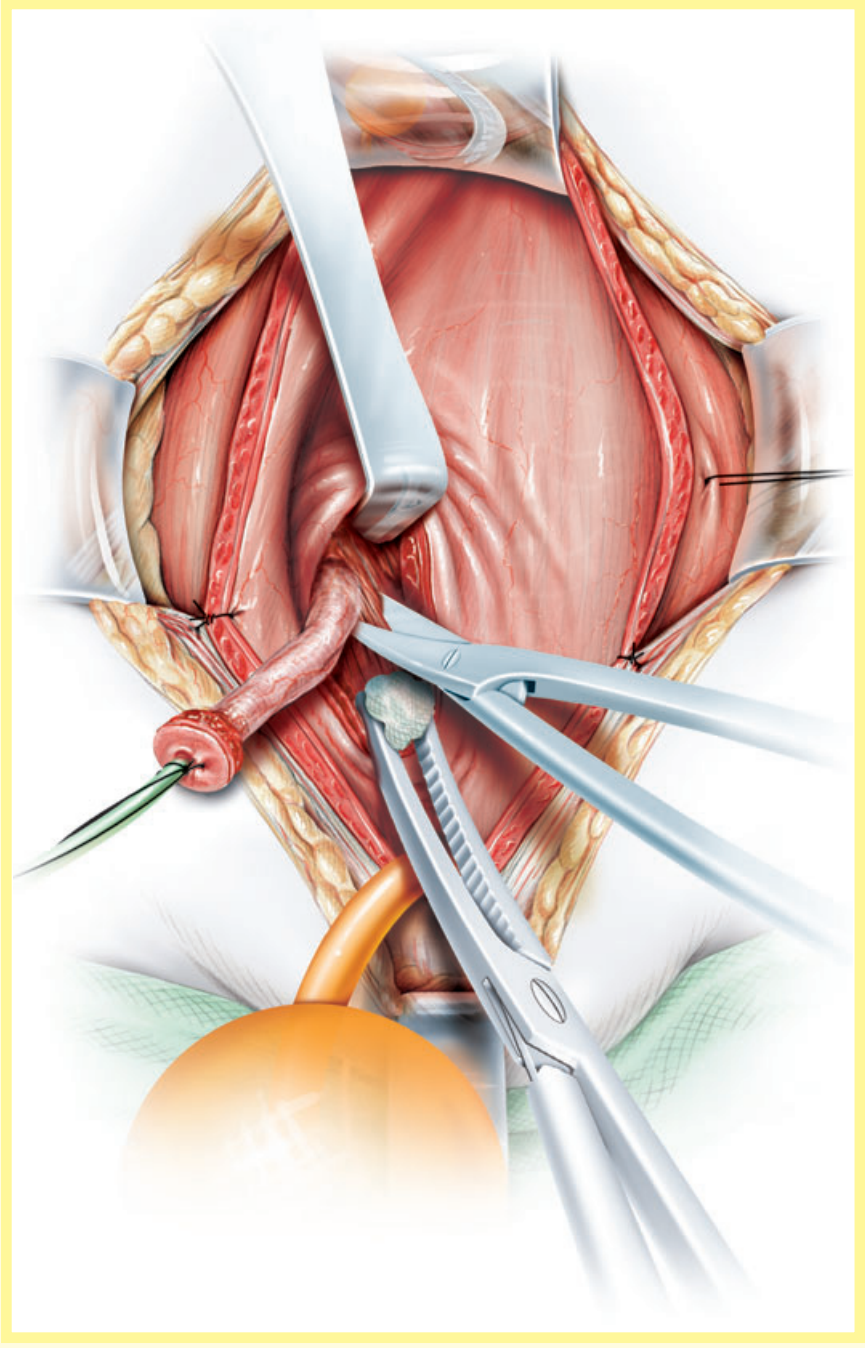
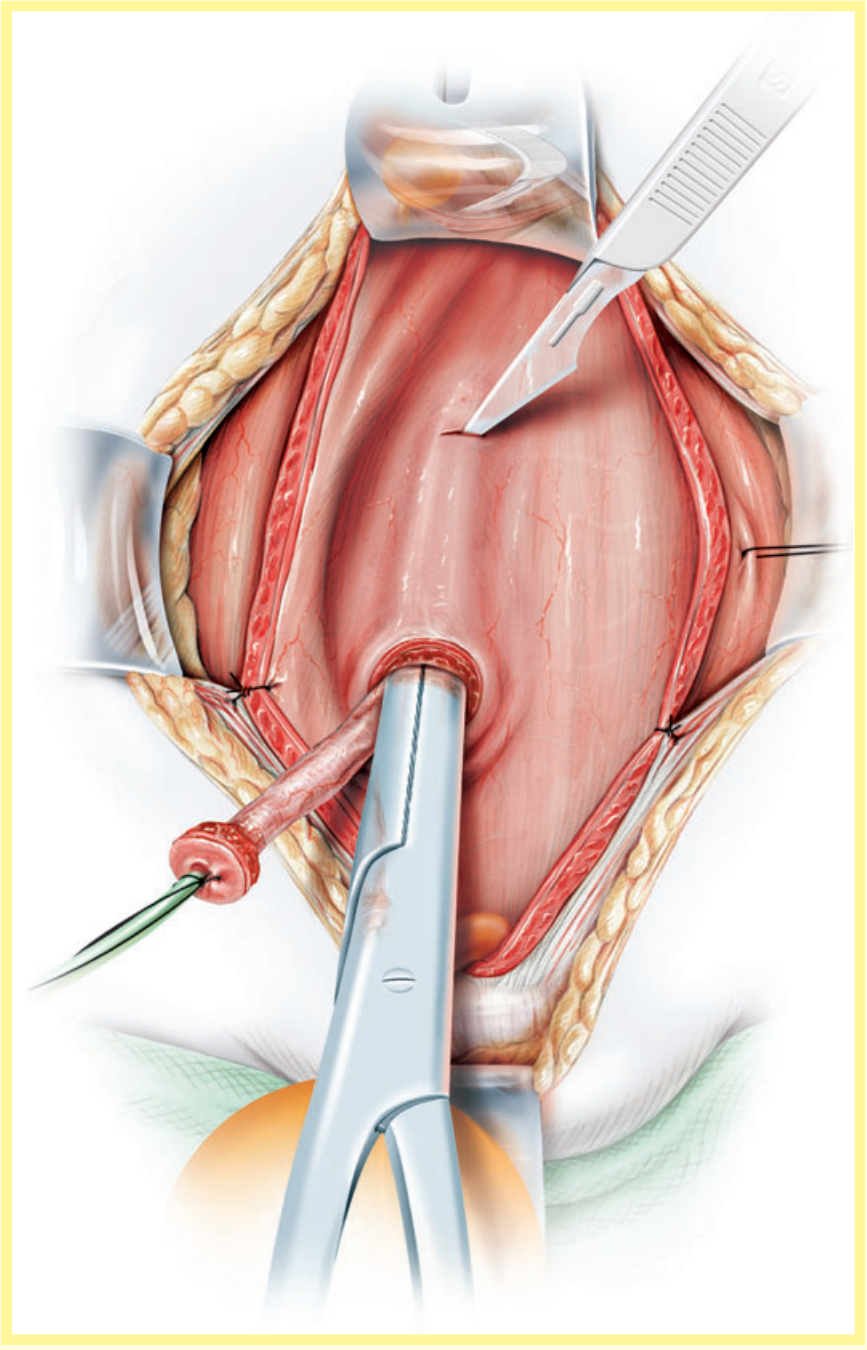


Figure 6

Transvesical mobilization of the adherent peritoneum from the distal ureter using a Langenbeck retractor for better visualization.

Figure 7

Transvesical insertion of an Overholt close to the bladder wall 3 cm above the old orifice incision of the bladder mucosa to create a neo-hiatus.



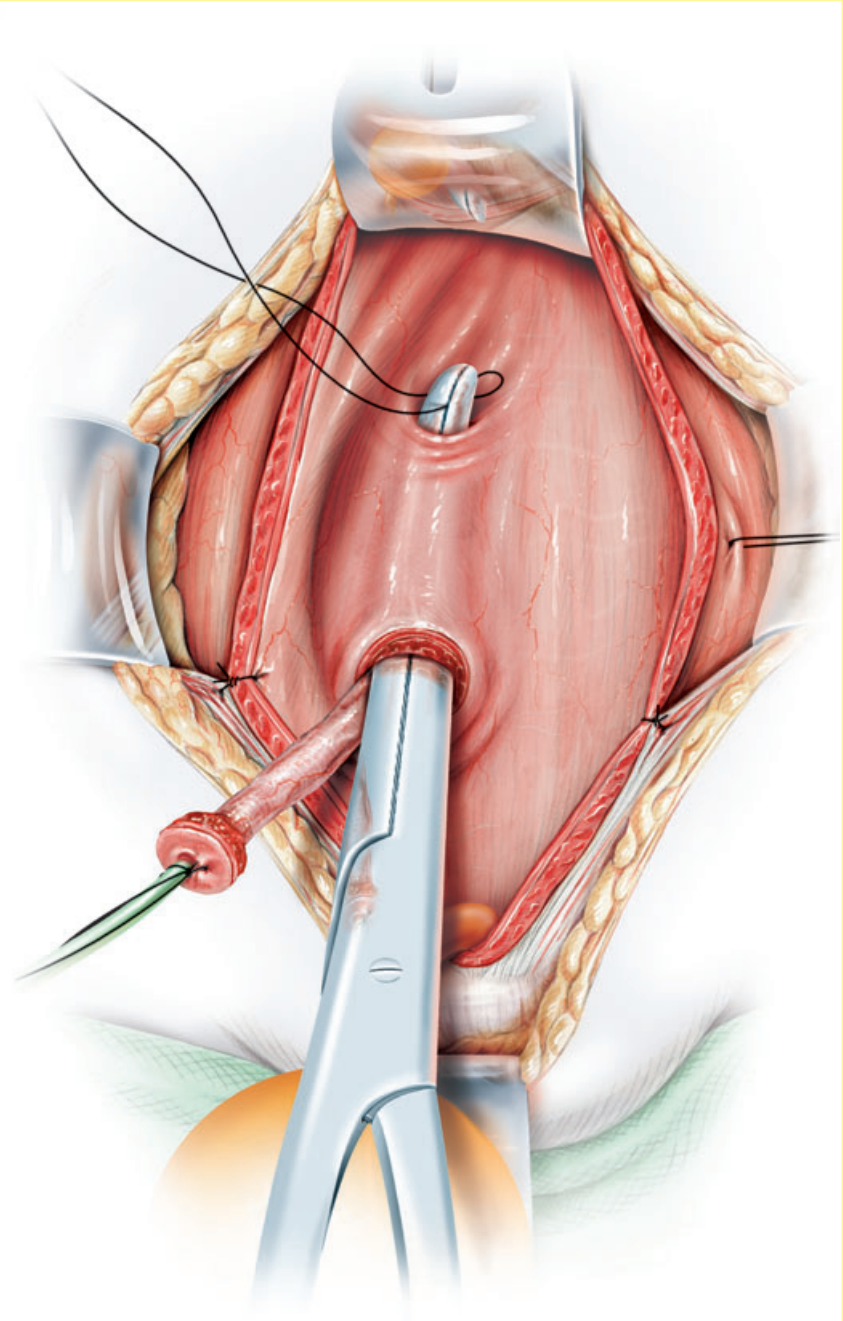
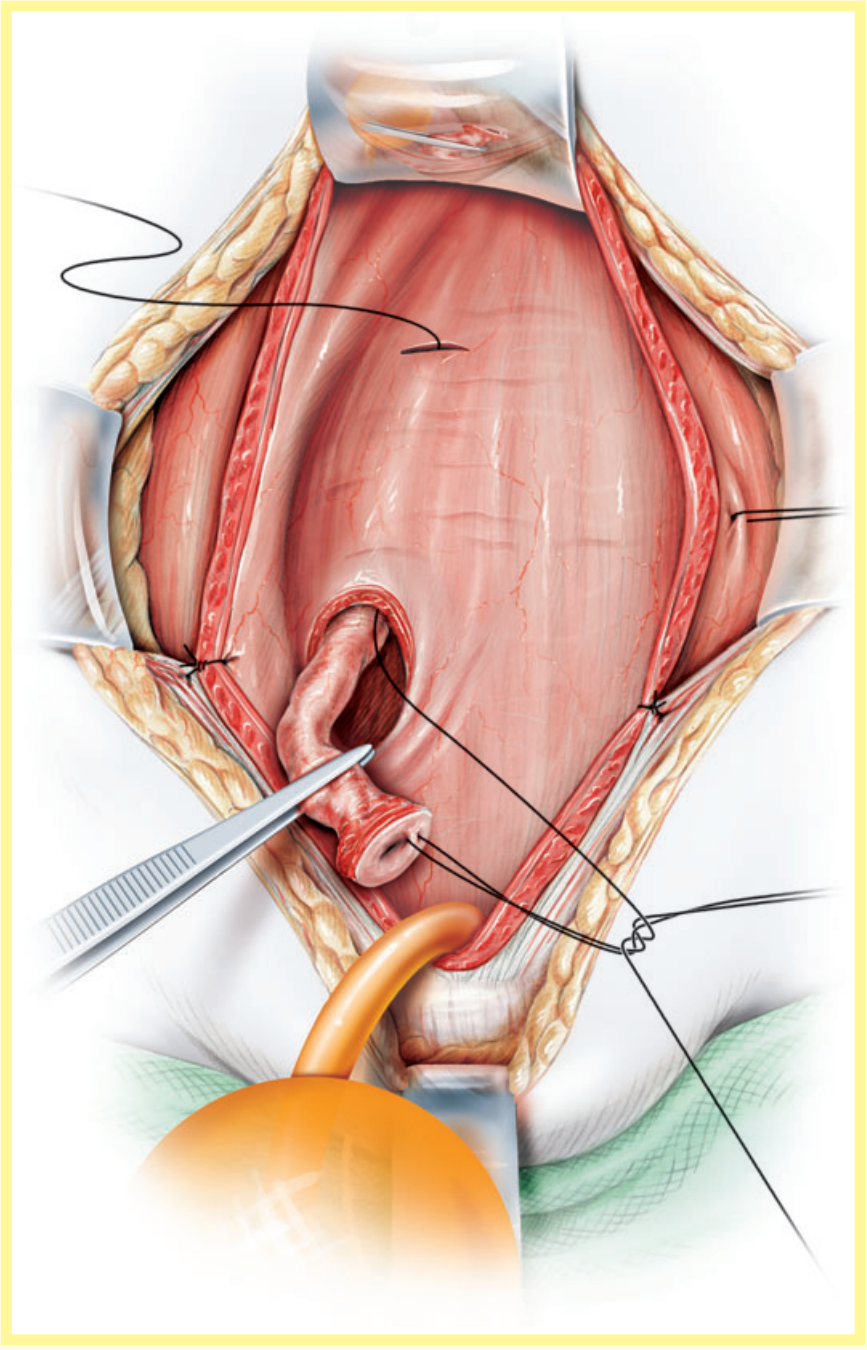


Figure 8

After preparation of a wide neo-hiatus, grasping of a free suture as a guide rail for the ureter.

Figure 9

Retraction of one suture end into the bladder. Fixation with the stay suture of the ureteric orifice after stent removal.



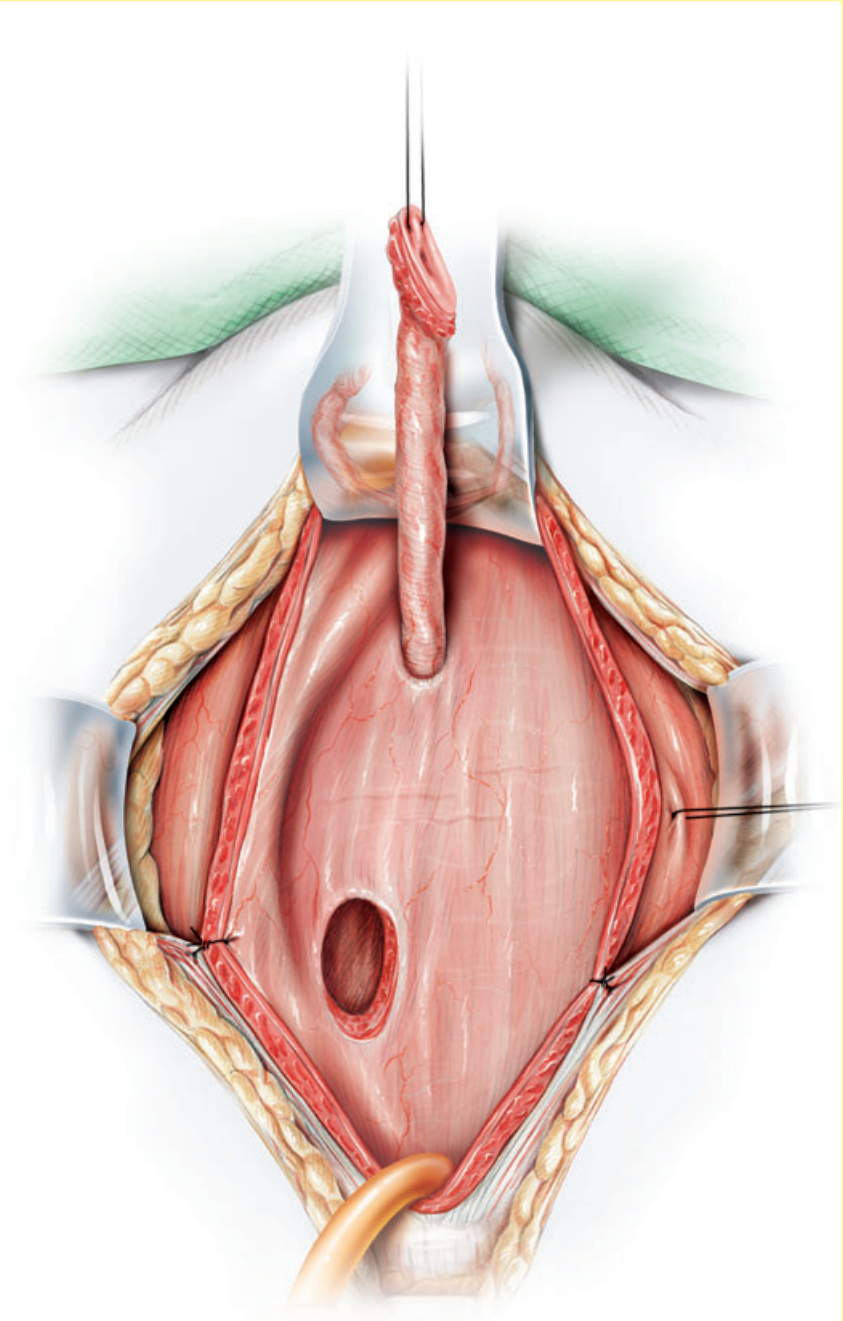
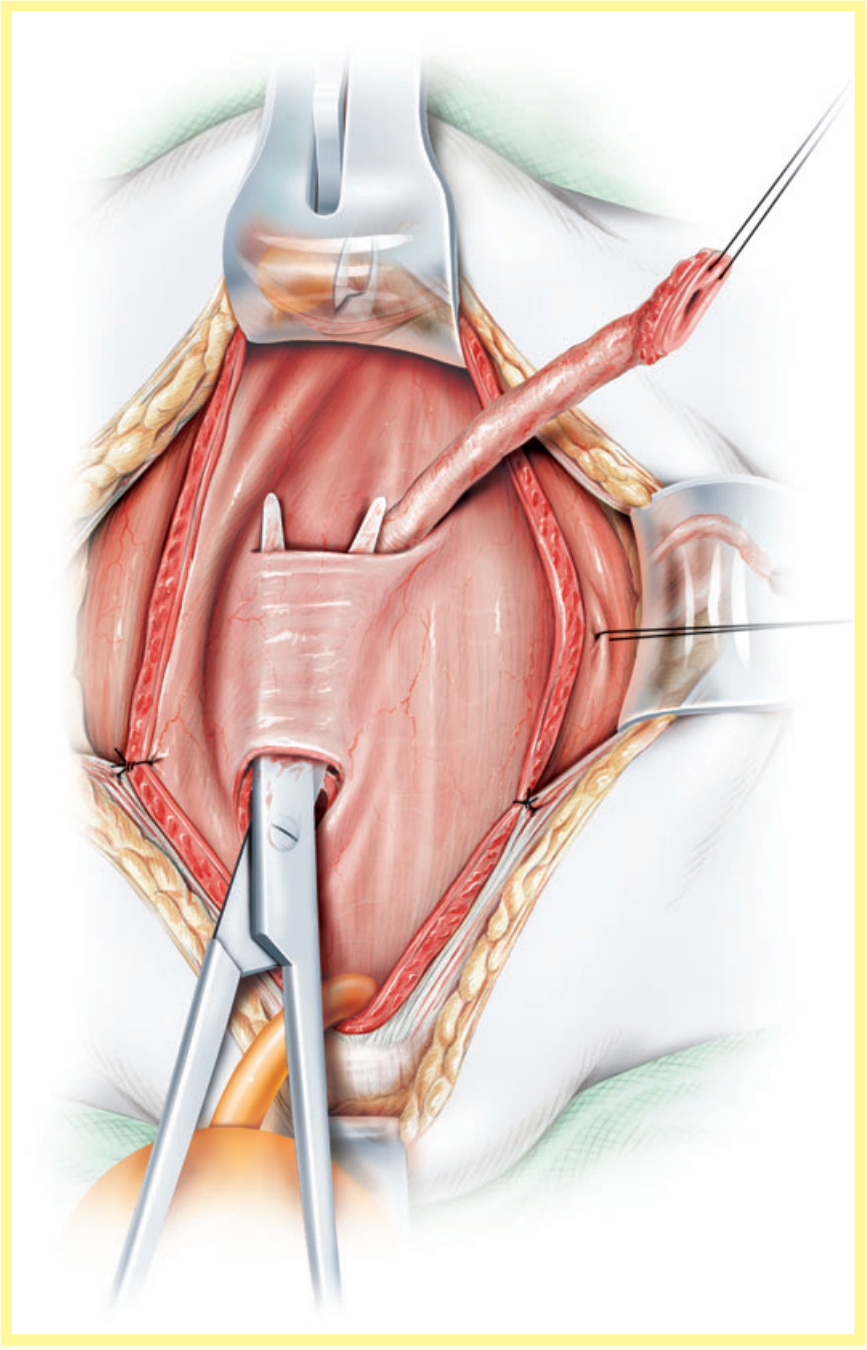


Figure 10

Passage of the extravesically mobilized ureter through the wide neo-hiatus pulling at the free suture end intravesically.

Figure 11

Transvesical transposition of the distal ureter. Submucosal tunnel preparation from the old to the new hiatus.



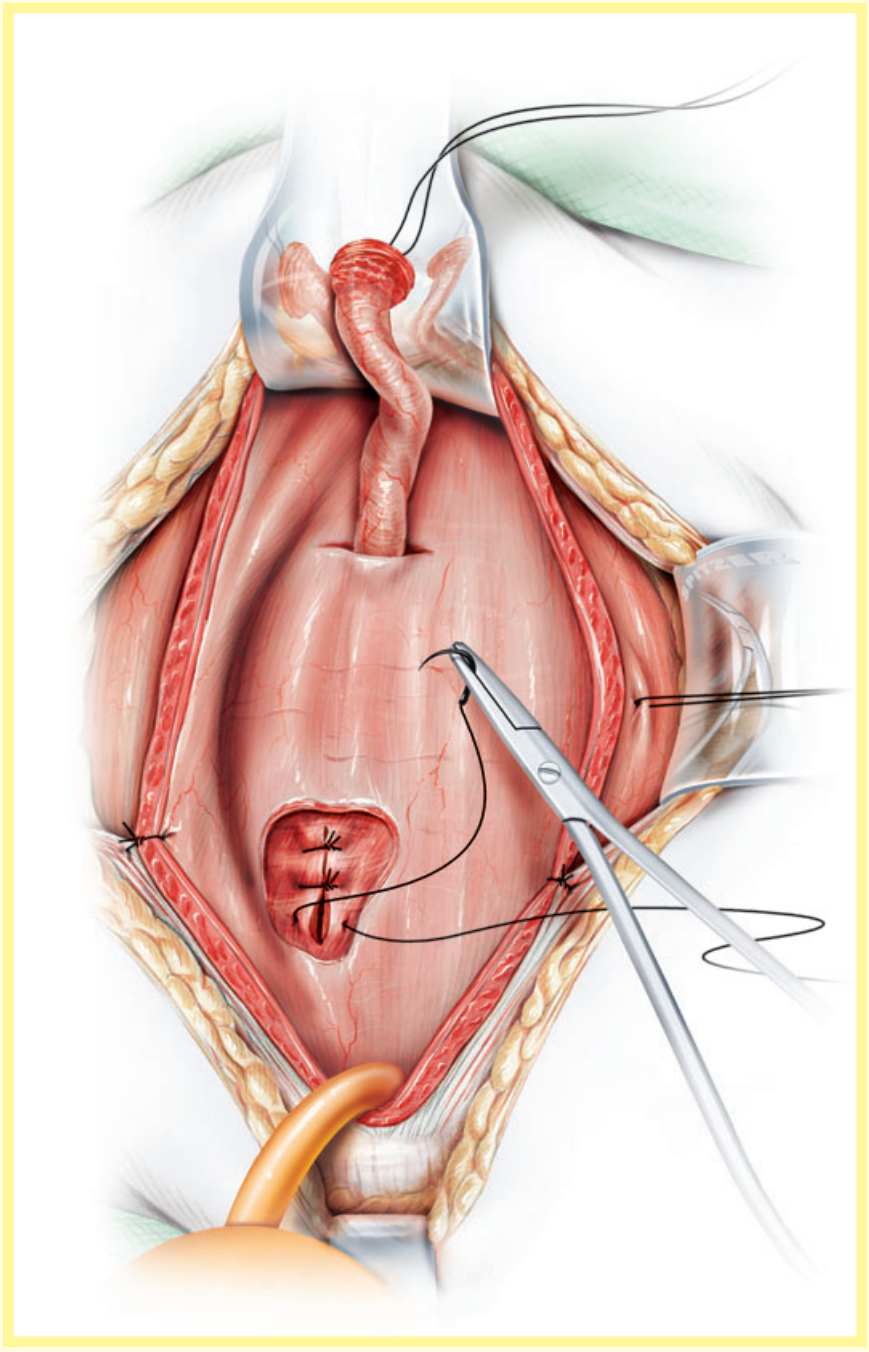
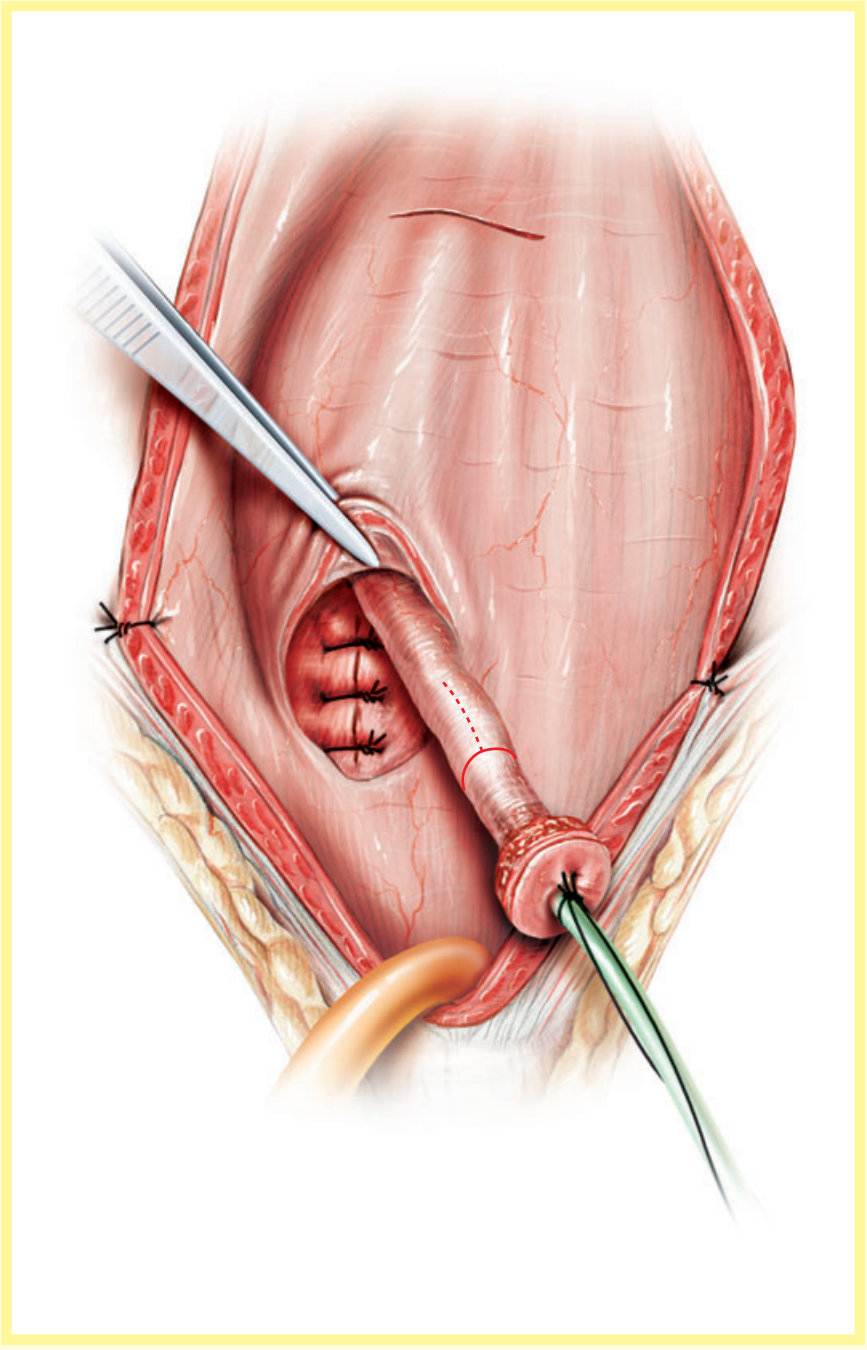


Figure 12

Closure of the bladder wall defect (former position of the old orifice) using three sutures.

Figure 13

Submucosal transposition of the distal ureter.



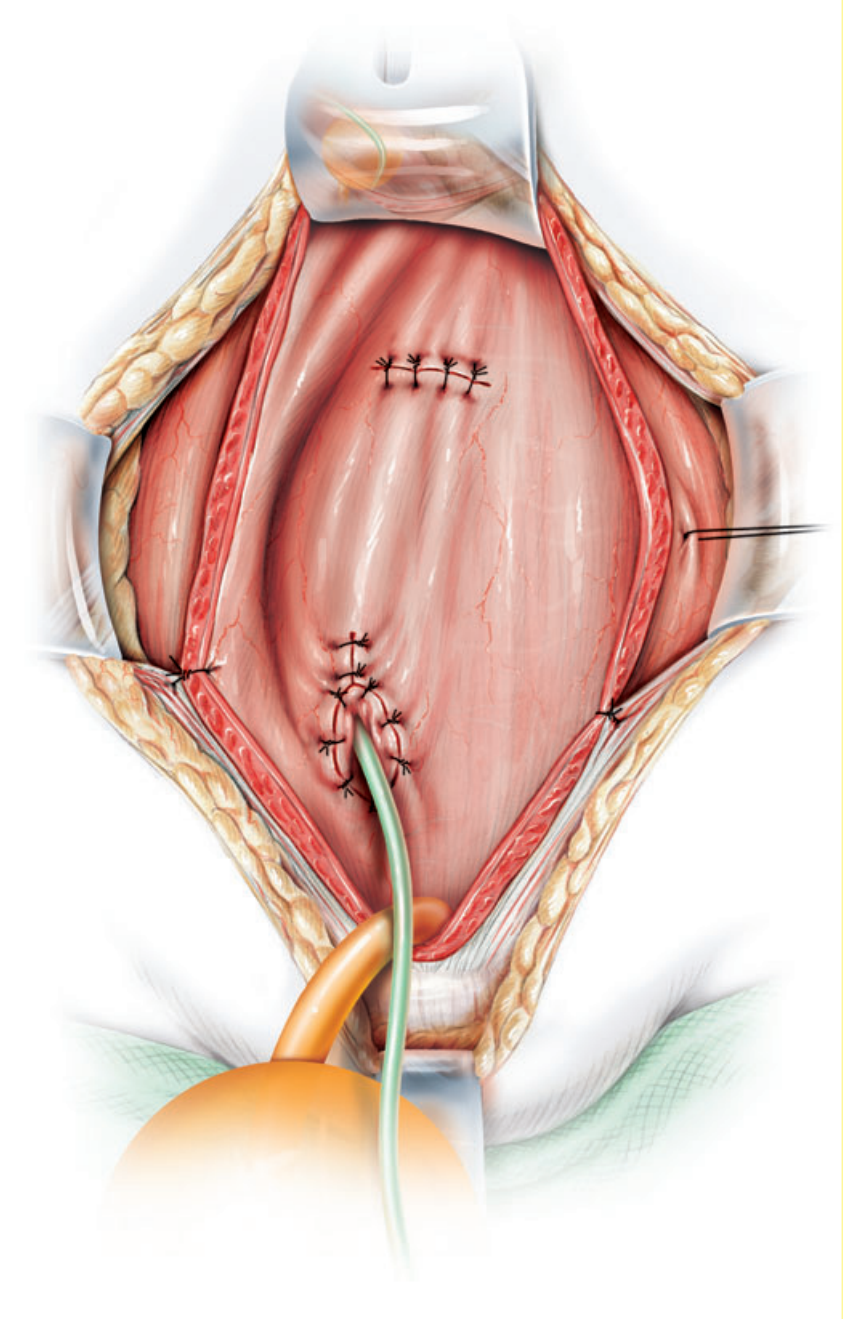
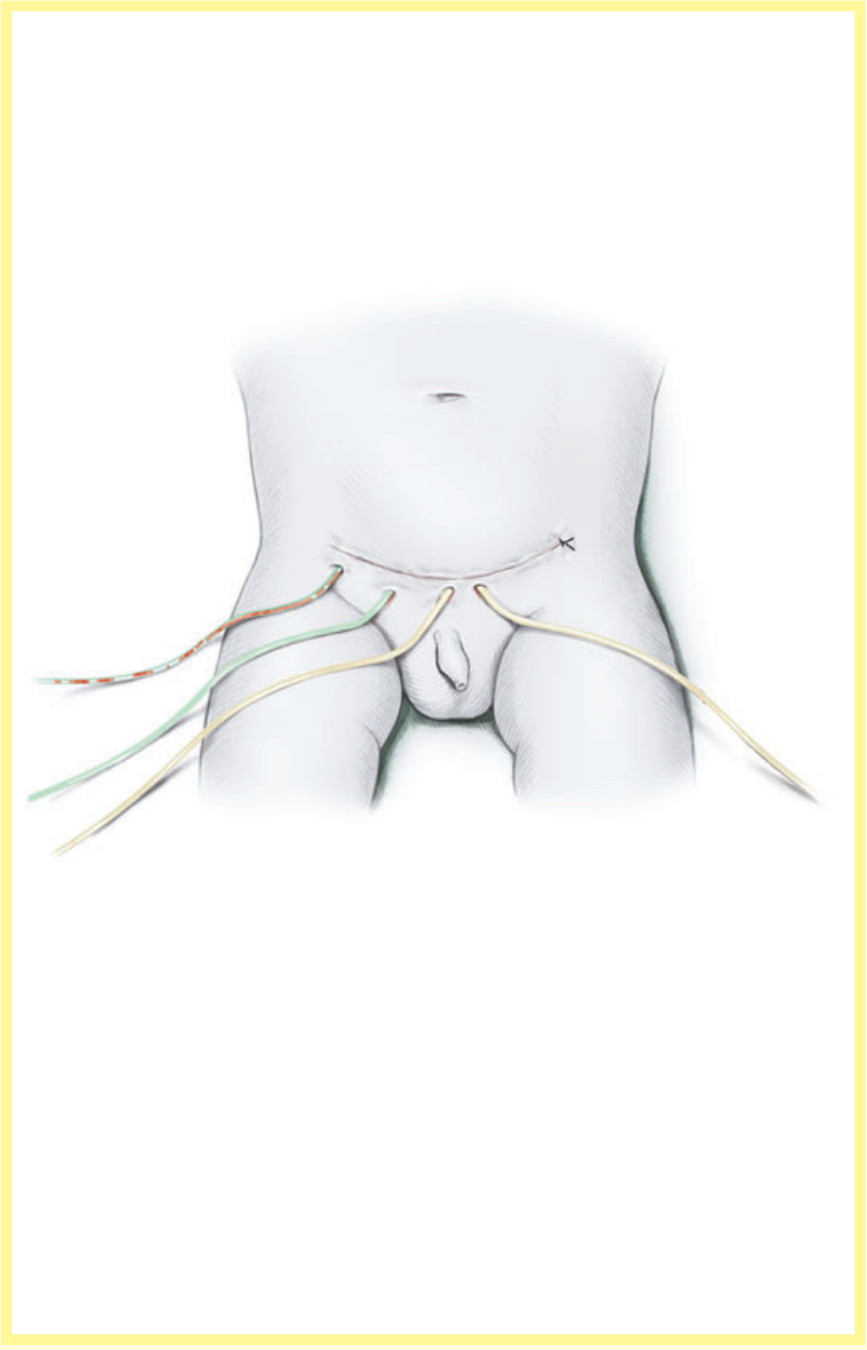


Figure 14

Fixation of the orifice at initial position after resection of a dysplastic ureteric segment. Closure of the bladder mucosa over the reimplanted ureter.

Figure 15

Wound closure. Drainage, ureteric stent and two cystostomies in place.



POSTOPERATIVE CARE

- Remove the wound drain on day 3.
- Remove the first cystostomy when urine is clear on day 3–5.
- Remove the first ureteric stent after 8 days, the second after 9 days together with the second cystostomy.
- Kidney ultrasonography after removing the stents.
- Antibiotic treatment (cephalosporin) during stenting.
- Antibiotic prophylaxis is given for 2 weeks in uncomplicated cases, otherwise for 3 months.
- Analgesic therapy: nalbuphine hydrochloride (Nubain, Endo Labs, Chadds Ford, PA) 0.1 mg/kg body weight i.v. before the end of the operation, 0.04–0.1 mg/kg body weight/h for 2–3 days.

COMMENTS/SURGEON-TO-SURGEON

The main indication for this procedure is bilateral reflux, which can be surgically corrected at one session [6,7]. It creates a neo-orifice in an anatomically correct position, which is easily accessible for endourological manipulations [6,7]. There is no risk of lesions to the pelvic ganglion, with persistent neurogenic bladder dysfunction, if the extravesical preparation is made close to the ureter in the layer of the meso-ureter [8].

By contrast with other procedures [2,4,5] the 'extravesical act' is not easy to teach and requires an experienced surgeon. However, bowel injury can certainly be avoided using a small Langenbeck retractor to visualize the distal ureter and mobilize the sometimes adherent peritoneum from the ureter.

Items to make life easier are stay sutures on the opened bladder dome at the rectus fascia, to guarantee an excellent view of the ureteric orifices. Retractors allow a good and permanent exposition of the whole bladder. Furthermore, the transvesical pull-through manoeuvre of the mobilized distal ureter can easily be accomplished using a free suture as a guide-rail for the ureteric transposition through the neo-hiatus.

A most helpful aspect excluding permanent obstruction of the reimplanted ureter is the use of a stent. First, an easy insertion through the bladder wall is associated with none or only mild kidney dilatation after surgery. Second, the stent left in place for 1 week diminishes the risk of oedema-related obstruction.

By contrast with the extravesical approach (Lich-Gregoir technique) the morbidity is increased due to the use of stents and cystostomies. However, painful bladder contractions can be treated successfully using anticholinergic drugs during stenting. We prefer two cystostomies to allow bladder irrigation, preventing blot clots and avoiding an indwelling urethral catheter in boys after surgery.

Our personal worst case was an early operation in a male infant developing bilateral obstructed kidneys and bladder shrinkage [9]. Before surgery there were no signs of a neurogenic bladder. Therefore our personal recommendation is to plan the operation after the first year of age, expecting a good bladder capacity.

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