Advanced
Urologic
Surgery
Advanced Urologic Surgery

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THIRD EDITION
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Preface to Third Edition

The aim of the editors in producing this textbook, the third edition of *Advanced Urologic Surgery*, remains the same as that declared in the preface to the second edition: we wish to produce a stimulating and up-to-date operative textbook that will supply the reader with a mainly pictorial interpretation of technical advancements and innovations, with a number of interesting modifications and suggested improvements, based on the large experience of a stellar group of well-known international urologists. The amount of text is kept to a minimum, and is structured into a series of concise bullet points that provide step-by-step information. We believe that this methodology will be of greater value to the reader than page after page of prose, however purple that might have been!

The first edition was reasonably limited and published exclusively in German. It was so instantly well received that further reprints were required within the first year of its appearance in print, as well as translation becoming standardized and with a further emphasis on pictorial representation of the various surgical techniques. This third edition, now entitled *Advanced Urologic Surgery*, has further developed the artistic format, but each author has been asked to supply, in bullet points, a number of different aspects about the surgical technique they discuss. Each author outlines the indications for the procedure in question, the limitations and contraindications, any specific preoperative management or instruments required, and then a brief description of the surgical technique, if possible overlaying their technique on any important anatomical principles. Potential complications are also described. Finally, the authors of each chapter draw on their own extensive experience and provide tips to the reader, which should be of help when performing the surgery.

At this point, we must express our considerable gratitude to Gottfried Müller, whose outstanding artwork has been a feature of the book, adding significantly to its readability and attractiveness as a product.

It has not been our intention to relentlessly work our way through all of the surgical procedures known in urology. In the preface to the second edition, it was pointed out that there were, for example, over 300 surgical procedures described in the treatment of hypospadias, and that it would clearly be impossible to cover even a fraction of these, and this is still the case with the third edition. However, all of the currently recommended techniques for the full range of urologic conditions are included in this textbook. Some of the traditionally employed standard techniques may not appear in these pages, as the emphasis in many places is on the description of newly introduced but already accepted urologic procedures. We believe that the reader will find value and enjoyment when reading this textbook, either as a ‘cover-to-cover’ read, or if the reader wishes to dip into the particular section that applies to their area of interest.

It has been a feature of the previous editions that readers felt free to communicate their views about the book to the editors and to the publishers. Once again, we would encourage this. The interaction between reader and editor/publisher is a help to both, from our point of view helping us to produce an excellent product which will be of continuing value to our readers.

We very much hope that you will enjoy reading this book.

R. Hohenfellner
J. M. Fitzpatrick
J. McAninch
Surgical atlases and operative textbooks which are often produced with a great deal of effort seldom elude an all too rapid ageing process. The more dilatory the co-authors participating, the longer the period of time it takes from planning and production to the finished product. From this sorrowful realization was born the concept of Innovations in Urologic Surgery. The aim was to produce a stimulating operative textbook with an animated interpretation of technical advancements and innovations or supplements, modifications and improvement proposals for standardized and new procedures.

The first edition, published in 1994, was limited and published only in the German language. The huge national and international interest which followed, led to two further German reprints in the same year and translations into Italian, Japanese, Portuguese, Spanish and now English.

For the purpose of limiting and systematizing the text, we completely revised the first German publication into categories according to indication, contraindication, instruments, approach, step by step technique, operative tricks, postoperative care and special features.

Reviews from surgeons familiar with the specific problems of each procedure provide an objective approach and at the same time contributed towards the evaluation of each respective technique. Three stars (***): standardized, proven over many years, recommended procedures; two stars: technically largely standardized, details could be improved upon, proven regarding reproducibility and long-term results with guaranteed data; one star: a new procedure, possibly useful and reproducible although without conclusive results.

In accordance with the concept described in the introduction, we re-evaluated the already published procedures. Analysis of information from congresses and operation seminars proved particularly helpful in this respect. The interest and demand for a particular technique can be calculated from the number of lectures, poster and video contributions. Additionally, the published complications demonstrated the reproducibility as well as possible technical shortcomings. For example, an analysis of ‘neuralgic ureter implantation sites’ in continent urinary reservoirs showed the occurrence of a predominantly short-term postoperative obstruction rate of up to 8%. Accordingly there was considerable interest in the antirefluxive ‘Hassan implantation’ with a minimal complication rate including also dilated, thick-walled ureters. Despite the comparative short follow-up of only 2 years, this alternative procedure was included.

The reader will undoubtedly search in vain for some of the more traditionally employed ‘gold standard’ techniques, which have proved their worth and from which there is no reason to deviate. Consequently, the reader will most probably not miss these all too familiar techniques. Nevertheless the editors are particularly grateful for comments and correspondence on these subjects. It is only through continuous dialogue with operating surgeons that these animated operative techniques can fulfill the original intentions.

Many authors who participated in the first German edition will miss their contributions in this English language version. The prevailing reasons were either high published complication rates or technical improvements developed in alternative procedures. The emphasis lies deliberately on a ‘selection’ of operative techniques; an undoubtedly problematic undertaking. On the other hand the reader may feel spoiled for choice in view of, for example, the 300 surgical procedures for hypospadias correction published until 1995. If only 20 from this number were reproduced, as is the case in the average surgical atlas, the situation would not be any better. Should the reader not systematically follow ‘hypospadiology’, he or she may not realize that a procedure perhaps favored by an institution for over 10 years and published in various national and international surgical textbooks has been abandoned due to a high late complication rate. Innovations in Urologic Surgery seeks to do justice to such a situation.

At this point we would like to express our gratitude to Mr Brammer who, apart from his artistic skills, possesses the necessary capacity and composure to produce high quality illustrations under the exacting demands of deadline pressure. Furthermore, we thank the reviewer for their critical and time-consuming work. Last but not least, our thanks go to Mrs Hug who ran the entire scientific secretariat superbly.

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Section 1
Kidney and Ureter
Part 1.1
Kidney and Upper Ureter
Chapter 1
Posterior Lumbotomy

V. Pansadoro

Introduction
This technique was first published by H. Lurz in 1956 and is the author’s method of choice for pyeloplasty whenever the laparoscopic approach is not possible. It is relatively easy to perform, demonstrate, and teach, with a short learning curve. There is limited exposure but it is good enough for the planned procedure.

Patient counseling and consent
As for a routine surgical procedure.

Indications
This procedure is indicated in surgical pyeloplasty and in approaches to the lumbar ureter.

Limitation and risks
• Very high kidney.
• Very short patient.

Contraindications
The technique is contraindicated in patients with previous cancer surgery, a horseshoe kidney, an anteriorly placed renal pelvis, and a history of previous surgery.

Preoperative management
As routine for kidney surgery.

Anesthesia
Blended, general, and peridural anesthesia.

Special instruments/suture material
• Bookwalter self-retaining retractor.

Operative technique
Anatomy
The lumbodorsal region is delineated by three bony structures: the iliac crest, the 12th rib, and the spinal processes. Between these three structures are the sacrospinalis muscle and the quadratus lumborum muscle. Two factors contribute to the originality of the Lurz approach: the incision is exactly on the quadratus lumborum muscle, which is situated in the center of the dorsolumbar region, and the operating field is widened by mobilization of the 12th rib after the costovertebral ligament is severed.

Patient’s position
The position of the patient on the operating table is important and needs emphasis. It is characterized by three main features. The laterolateral axis makes a 45° angle with the operating table. It is not necessary for the table to be bent too much because the muscles do not need to be stretched; on the contrary, it is better if they are relaxed to allow easier retraction. The thorax is turned ventrally and the pelvis dorsally to allow a better opening of the dorsolumbar space. The legs and the upper arm are positioned as usual for a flank incision (Fig. 1.1).

Skin incision
Once the iliac crest, the 12th rib, and the spinal processes have been localized, the sacrospinalis muscle can be identified easily and the surgeon is able to localize the quadratus lumborum. This muscle goes from the medial part of the 12th rib to the mid third of the iliac crest; its upper third is under the sacrospinalis muscle. The skin incision is made over the quadratus lumborum muscle and begins at the costovertebral angle, over the lateral part of the sacrospinalis muscle, and with a slightly oblique course extends down to the iliac crest,
3–5 cm in front of the anterior margin of the sacrospinalis muscle (Fig. 1.2).

**Approach to the kidney**
The incision of the muscular plane has the shape of a ‘Y’, with the sacrospinalis muscle contained between the two arms of the Y (Fig. 1.3). The incision of the muscular layers is a step-by-step procedure that should open the flank safely and exactly, and avoid any injury to the muscle and nerves present in this region. After the incision of the subcutaneous fat, the last fibers of the latissimus dorsi and the serratus dorsalis caudalis muscles are cut.

As the incision is deepened in its cranial portion, the posterior aspect of the lumbodorsal fascia is opened and the fibers of the sacrospinalis muscle are uncovered (Fig. 1.4). These fibers are easily identified by their craniocaudal direction. By cutting through the posterior lumbodorsal fascia around the sacrospinalis muscle, the surgeon completes the incision of the superficial arm of the Y. The sacrospinalis muscle is then prepared in its lateral and deep aspect and is retracted medially, uncovering the anterior aspect of the lumbodorsal fascia and, under this, the quadratus lumborum muscle (Fig. 1.5). When the fascia between these two muscles is incised, the deep arm of the Y is completed and the lumbodorsal fascia is severed caudally over the quadratus lumborum. Following strictly the direction of the fibers of this muscle, the surgeon completes the limb of the Y (Fig. 1.6). Retracting this muscle medially, we uncover the posterior aspect of the perirenal (Gerota’s) fascia and identify the iliohypogastric and ilioinguinal nerves. This fascia must be incised between these nerves, which are retracted to each side by two Richardson retractors, reaching the perirenal area (Fig. 1.7).

**Ureterolithotomy**
In the event a ureterolithotomy must be performed, a deeper retractor should be inserted in the anterior aspect of the wound, so the inferior pole of the kidney can be lifted and moved cranially. Usually the ureter can be identified by simple inspection of the posterior aspect of the retroperitoneal space (Fig. 1.8). An oblique ureterotomy is preferred, and a 5/0 extramucosal running suture is used for closure. Of course the posterior approach is not indicated for stones lying lower than the iliac crest.

**Wound closure**
The wound closure is accomplished with interrupted 1/0 absorbable sutures, in one layer, on the lumbodorsal fascia. The quadratus lumborum and sacrospinalis muscles will regain their normal positions. Patients will usually experience an almost painless recovery.

**Tips**
Before surgery obtain a KUB in a supine and standing position to evaluate the kidney’s mobility. Avoid fixed kidneys. By incising the costovertebral ligament the 12th rib can be retracted easily obtaining a wider exposure.

The surgeon who uses posterior lumbotomy must learn how to get the best exposure with this relatively small incision. During the opening phase, two Richardson retractors are used, and after the renal sinus has been prepared, two Gil-Vernet sinus retractors are essential to bring the kidney into the best position. Only then is a self-retaining retractor used to provide the best exposure, with the kidney lifted and positioned in the center of the incision.

**Postoperative care**
As routine for kidney surgery.

**Complications**
Care must be taken not to injure the ileoinguinal and ileohypogastric nerves to avoid secondary anesthesia of the corresponding region. Temporary hypotonus of muscles of the anterolateral abdominal wall, caused by stretching of the corresponding nerves, may happen.

**Troubleshooting**
The patient’s positioning is of the utmost importance to get the best from the incision. The posterior lumbotomy is a fast, easy, relatively painless, and minimally traumatic approach to the kidney and upper ureter but the working space is more limited than usual. The surgeon who uses the posterior lumbotomy technique should avoid using it for the wrong indications.

**Results**
The muscle-sparing incision, lack of postoperative pain, absence of postoperative laparocele, and short hospitalization are the rewards of this approach.

**To do**
It is the perfect incision for a skinny patient, with a mobile kidney and a posteriorly placed dilated pelvis.
Not to do

The surgeon who uses this approach should know the limits of the incision and use it for the right indications.

References

Figure 1.4  By incising the superficial arm of the 'Y', the fibers of the sacrospinalis muscle are uncovered.

Figure 1.5  When the sacrospinalis muscle is retracted medially, the quadratus lumborum muscle is exposed under the deep aspect of the lumbodorsal fascia (a–b, the costovertebral ligament).

Figure 1.6  Incision of the limb of the 'Y' over the quadratus lumborum (c, the lumbodorsal fascia).

Figure 1.7  The iliohypogastric and ilioinguinal nerves are exposed, and the perineal space is entered between the two.

Figure 1.8  The lumbar ureter is usually easy to identify with proper anterior retraction.

Figure 1.9  The proper use of two sinus retractors allows visualization of the entire renal pelvis.
Chapter 2
Laparoscopic Pyeloplasty

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Introduction
The Anderson–Hynes pyeloplasty is the most commonly performed surgical procedure for the correction of congenital or acquired pyeloureteric junction (PUJ) obstruction. It is widely recognized as the gold standard technique. Global interest in the procedure was initiated with the first laparoscopic pyeloplasty performed in 1993 [5]. With constant improvements in laparoscopic instruments over the past decade, many centers have progressed from the classic open operation to an entirely laparoscopic technique.

An evaluation of the laparoscopic versus open technique reveals comparable results. Success rates of over 90% have been reported following the laparoscopic procedure in adults as well as in children [1–3,6]. Additionally, the results of the laparoscopic Anderson–Hynes pyeloplasty have been 10–25% more successful when compared to other minimally invasive techniques (percutaneous antegrade or retrograde endopyelotomy). With endoluminal techniques, there is an ever-present risk of injuring a crossing vessel, resulting in hemorrhage and potential renal loss. The magnification of the telescope allows for accurate dissection of the renal hilum with easy identification of any aberrant vessels that can be safely preserved [4]. Further advantages of the laparoscopic technique include its minimal invasiveness, lesser postoperative analgesia requirement, quicker recovery time, and improved cosmetic results.

Indications
These are identical to the open Anderson–Hynes pyeloplasty.

Contraindications
• Active urinary tract infection.
• Renal malrotations.
• Large renal calculi.
• Abdominal aortic aneurysm or prior abdominal surgery (here a retroperitoneal approach is recommended).
• Cardiorespiratory limitation (such a patient is unable to tolerate a capnoperitoneum).
• Previous attempt at PUJ obstruction repair (depending on the surgeon’s experience).

Preoperative management
This is identical to the open Anderson–Hynes pyeloplasty. Note that the preoperative placement of a ureteric stent/catheter is not recommended.

Special instruments/suture material
• Standard laparoscopic tower/monitor.
• 10 mm, 0° telescope (optional 30° telescope).
• Veress cannula.
• 1 × 12 mm trocar (for optic).
• 3 × 5 mm trocars.
• Bipolar forceps: 5 mm.
• Atraumatic dissectors: 5 mm.
• Metzenbaum scissors.
• Hook scissors.
• Irrigation sucker: 5 mm.
• Needle holder: 5 mm.

Surgical approach
Transperitoneal access is an easier approach for the beginner and the overview is better with more space for instrument placement and handling. Aberrant vessels can be readily identified and dissected free without mobilizing the kidney. A disadvantage of this approach is the potential injury to the intraperitoneal organs.

Operative technique
• Insert an indwelling catheter, with the patient in a lateral position without hyperextension.
• Peritoneal access is gained initially with a Veress cannula.
Insufflate the peritoneal cavity with CO₂ at 12 mmHg pressure and insert a 10/12 mm safety trocar (Versaport).

- In obese patients the optical trocar should be placed into the pararectal line for optimal visualization of the retroperitoneal ureter and kidney. An optional minilaparotomy is an alternative for safe trocar placement.
- Insert the telescope and place the other three trocars under vision.
- Divide any adhesions.
- The Toldt’s line is incised and the colon is mobilized medially. For a left-sided operation, mobilization needs to include the splenic flexure, and for a right side the hepatic flexure. The mobilization needs to continue 4 cm below the lower pole of the kidney.
- Identify the ureter, which lies medial and caudal to the lower pole of the kidney. Dissect and isolate the ureter up to the renal pelvis.
- A large dilated renal pelvis can be easily dissected free including the PUJ and the proximal ureter.
- To guarantee a tension-free anastomosis, 5 cm of proximal ureter needs to be mobilized, ensuring that the periureteric adventitia is maintained around the ureter to prevent ischemia. Only bipolar cautery should be used for hemostasis at the renal pelvis.
- A transperitoneal approach allows excellent visualization of any aberrant vessels that can be dissected free without injury and without compromise to the renal blood supply.
- Division of the ureter is made obliquely in a cranial medial to a caudal lateral direction below the stenosis. If an aberrant lower pole vessel is present, anterior transposition of the divided ureter is required prior to its repair.
- Spatulate the lateral aspect of the ureter for 1.5 cm.
- Rhomboid resection of the renal pelvis: care must be taken not to resect too much tissue and enter the renal calyces, which may result in scaring and narrowing.
- Any associated calculi can be retrieved and placed into an Endobag® to be removed at the end of the operation.
- The reconstruction of the pyeloureteral anastomosis follows the exact principles of the open Anderson–Hynes operation.

**Tips**

- Before cutting the PUJ, a ‘stay’ suture is placed on the medial margin of the ureter and caudally of the stricture to avoid malpositioning (rotation) of the ureter. The stay suture is removed after the first anastomotic suture.
- Once the posterior wall anastomosis has been completed, a 0.038 inch Terumo® guidewire (Terumo Corporation, Tokyo) is inserted via the cranial trocar through the ureter into the bladder. A 6 or 7 Fr double-J catheter is placed over this wire into the renal pelvis. No other internal drain is required (e.g. nephrostomy tube).
- If the angle of the cranial trocar does not allow for easy guidewire placement into the ureter, a two-part puncture needle (diameter 1.3 mm/17.5; Bard-Angiomed, Germany) can be inserted into a more appropriate site. The guidewire and double-J catheter can be introduced through this following minor dilatation of the tract. Alternatively, the wire is totally inserted into the abdominal cavity and removed through a 5 mm port for double-J stent insertion.
- Drain placement can be achieved by introducing a laparoscopic grasper through the cranial trocar and out from the caudal trocar site. The caudal trocar is removed and a 20 Fr Robinson drain grasped and placed into the operative site.
- A stay suture may be needed to assist with the operation. A straight needle (KS needle, 2/0 Vicryl) is inserted through the lateral abdominal wall and placed through the renal pelvis and out where it is fixed on the skin.
- Renal calculi that are difficult to find can be retrieved with the aid of a flexible cystoscope and a Dormia basket. A 5 mm trocar will need to be exchanged for a 10/12 mm trocar for passage of the cystoscope. Alternatively a 5 mm telescope is placed through one of the other trocars and the (umbilical) 10/12 mm trocar site is used for the flexible cystoscope.

**Postoperative care**

The urethral catheter is removed 2–3 days after the procedure. The urethral stent is removed 3–4 weeks later.

**References**

Figure 2.1 Room set-up for a laparoscopic pyeloplasty.

Figure 2.2 Trocar positions for laparoscopic pyeloplasty. In obese patients the optical trocar should be placed in the pararectal line (arrow).

Figure 2.3 Mobilization of the colon to expose the renal pelvis and the upper ureter.
Figure 2.4 The technique of laparoscopic suturing. The first stitch is placed at the distal tip of the transected renal pelvis and the medial part of the spatulated ureter.

Figure 2.5 Double-J catheter placement in an antegrade fashion using a Terumo® guidewire: (A) via the cranial trocar, and (B) using a two-part puncture needle (see Tips).

Figure 2.6 After the dorsal pyeloureteral anastomosis is completed, the ventral defect is closed by running suture. The detail shows the technique of stitching, which involves taking more muscularis and less urothelium.

Figure 2.7 Drain placement (20 Fr Robinson drainage).