Chapter 1
General Laparoscopic Tips

How Do You Organize Your Foot Pedals for the Various Energy Sources?

Dr. Udaya Kumar

Monopolar diathermy, bipolar diathermy, Harmonic scalpel, and argon beam coagulator are some of the most commonly used energy sources during laparoscopic surgery, often all during the same case. This creates a clutter of foot pedals on the floor near the surgeon. One trick to reduce this clutter is to tape the smaller bipolar diathermy pedal securely onto the top of the monopolar diathermy pedal, which is taped to the floor. The current model of the Harmonic scalpel is entirely hand-activated, eliminating the need for a foot pedal.

How about Patient Positioning?

Dr. Kumar

For transperitoneal nephrectomy, I position the patient in a 45- to 60-degree lateral position. For retroperitoneal nephrectomy a full flank position is used. Align the iliac crest at the flexion point of the table to achieve adequate opening of the space between the iliac crest and the 12th rib for retroperitoneal procedures. We take care to minimize the degree of table flexion and only minimally elevate the kidney rest. This is important to prevent neuromuscular injuries and rhabdomyolysis, which can be severe issues.

During laparoscopic radical prostatectomy, the patient is positioned in a steep Trendelenberg position. The patient tends to slide toward the head end of the bed when maintained in this position for prolonged periods of time. There are several suggestions to overcome this difficulty. One we have found most useful is to place the patient (with no intervening gown, clothing or other material) on flat gel padding. This provides adequate traction to prevent the patient from sliding. An X-shaped tape, from below each shoulder across the chest, taped to the bed is also useful. Using shoulder guards to buttress each shoulder is a bad idea as the patient can develop pressure-induced neuropraxia.

Dr. David Albala

For the positioning during nephrectomy, I like to use a beanbag. I position the patient with an axillary roll in a modified flank position with arms folded. The beanbag allows one to position the patient adequately and after it is deflated, the patient is securely held in that position. I don't think that the kidney rest adds anything to patient positioning for this procedure.

How Do You Organize Your Laparoscopic Instruments?

Dr. Kumar

The array of instruments that one uses during laparoscopy also causes a clutter on the instrument

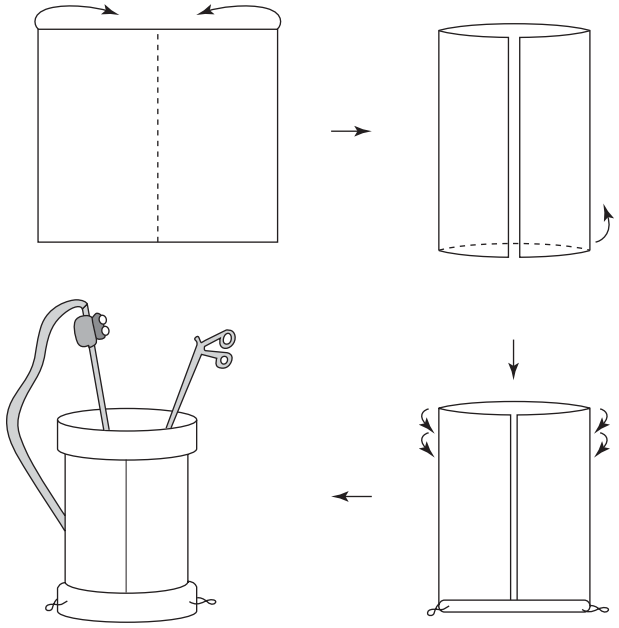

Fig. 1.1 Instrument holder.

table. One way to circumvent this is by using two or three instrument holders that will conveniently hold four to five instruments each. The holders are strategically placed within easy reach of the surgeon.

The instrument holder is made simply by using a small sterile towel that is commonly available. The towel is folded twice toward the middle. One end of the towel is closed off by folding and clipping with a towel clip. The open end is turned inside out twice, creating a collar. The instrument holder is ready! One may not only hold any of the long laparoscopic instruments with this pouch but also the hot water flask that is used for warming up the laparoscope lens.

Your Thoughts about Starting with Laparoscopy?

Dr. Jean de la Rosette

One of the problems faced by people starting to get involved in laparoscopy is that they have difficulty making choices. They move from one technique where they see an improvement to the next and then the next and the next. What I would strongly recommend when starting out with laparoscopy is that, first of all, mentoring is very important. The way we learned all the tricks is that one of my colleagues went away for half a year for training elsewhere, where he participated actively in laparoscopic surgery. That same colleague committed himself, for one year, to come to our place, once every week (for training) and then we continued learning the tips and tricks from him for the next one or two years till we became good at them. Only then did we shift to a higher level and change small things here and there. It is always good to have a strict schedule and not to try to improve too fast while one is not yet familiar with the technology.

What Is Your Typical Bowel Preparation for Laparoscopic Surgery?

Dr. Inderbir Gill

I believe in the dictum that "an empty colon is a happy colon." As such, typically, for all laparoscopic surgery,

unless there is a contraindication, I request the patient to take two bottles of magnesium citrate on the afternoon prior to surgery, with nil orally from midnight. This is pretty much true for all abdominal laparoscopic surgery in an adult. For laparoscopic radical cystectomy wherein bowel urinary diversion is anticipated, a more thorough bowel preparation comprising 4 liters of GoLytely® and a Fleets® enema the evening before surgery is performed. We typically do not perform antibiotic preparation of the bowel. Clearly, different surgeons have different protocols for bowel preparation during laparoscopic surgery.

How Do You Position the Patient's Arms during Various Urologic Laparoscopic Procedures?

Dr. Gill

For all pelvic laparoscopic surgeries (prostatectomy, radical cystectomy, pelvic lymph node dissection, incontinence surgery, seminal vesical surgery, etc.), both arms are carefully padded and adducted by the patient's side. This is important since outstretched arms severely limit the surgeon's own mobility, and may also lead to hyperextension of the arms and brachial plexus injury. For renal and adrenal laparoscopy, wherein the patient is placed in the flank position, the standard arm positioning, similar to open surgery in the flank position, is obtained. Care must be taken to appropriately pad the

axilla, and all bony prominences, maintaining extremities in a neutral position.

Do You Apply Local Anesthetic at Port Sites?

Dr. Stuart Wolf

We are impressed by the effectiveness of bupivacaine infiltration at port sites for reducing pain after laparoscopy. We published a randomized trial in the *Journal of Urology* that demonstrated bupivacaine infiltration to reduce narcotic use by almost 50%, and the results were statistically significant in both standard transperitoneal laparoscopic and hand-assisted laparoscopic sub-groups.[1] At the beginning of the case, we infiltrate 0.5% bupivacaine into the pre-peritoneal tissues at the port sites, and for hand-assisted cases we also infiltrate the fascia around the incision for the hand-assistance device. The total amount is 30 ml, divided up between the various sites (5–10 ml in port sites, and 15 ml at the hand-assistance site).

Any Tips for Obtaining Abdominal Entry for Laparoscopic Surgery?

Dr. Matthew Gettman

The one thing about entering the abdomen that I like to do, especially during placement of the first trocar is, after

I have made my 1-cm incision, I use trachea hooks and I anchor the trachea hooks into the fascia as opposed to using towel clamps. It really anchors the abdominal wall during placement of the initial trocar and I usually use a closed (Veress needle) technique. This technique of using the trachea hook was something that I learned from Reinhardt Peschel and Gunter Janetschek in Austria.

Dr. Pilar Laguna

We place our first port (for the laparoscope) in an open fashion and after opening the fascia, we immediately place a fascial stitch. During exit, we have the fascial stitch already in place and closure is more rapid (Figure 1.2).

Also to avoid leakage of gas if the incision of the first port is slightly bigger than 12 mm, we place a small piece of Tul Grasum (or a small gauze with Vaseline) under the skin and around the trocar (Figure 1.3).

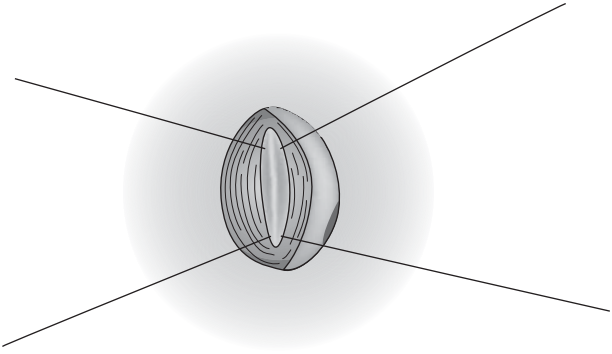

Fig. 1.2 Fascial stitch at entry.

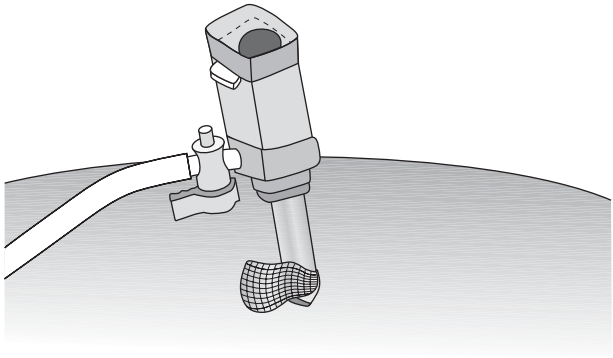

Fig. 1.3 Vaseline gauze to prevent air leak.

What Is Your Technique for Veress Needle Insertion and Trocar Placement?

Dr. Marshall Stoller

A trick that I use is our initial blind Veress access. We have now done over 700 laparoscopic upper tract procedures and we always use Palmer's point, which is one fingerbreadth below the costal margin at the lateral border of the rectus muscle (Figure 1.4). Palmer described it on the left side; we do a congruent puncture site on the right side. Even with previous abdominal operations, needle placement is very unlikely to encounter adhesions or cause bowel injuries in these locations. When we do a pelvic procedure, we will still go up high at Palmer's point for initial access and establish pneumoperitoneum. We've never had a splenic injury on the left side. On occasion we have had a punc-

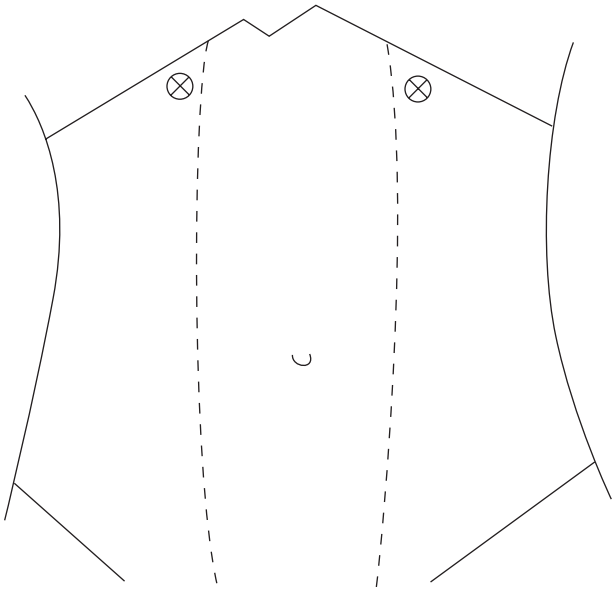

Fig. 1.4 Palmer's point.

ture hole in the liver on the right, but there has been no need for any intervention in those cases, although one should always keep this foremost in mind.

Dr. Kazuo Suzuki

In general, I prefer to insert the first trocar by the open technique. If using the Veress needle technique, I like to use the 2-mm telescope inserted through the Veress needle port to place other trocars under direct laparoscopic observation, avoiding bowel or other visceral injury.

Dr. de la Rosette

One tip only: don't use the Veress needle! Just go for an open access. In my opinion, it is safer. It is easier and faster.

Dr. Gill

Almost always, I use the Veress needle. . . . In over 4,000 cases, we have used the Veress needle predominantly, even in patients with history of previous abdominal surgery. Everybody does it differently; and this is how I do it. There are a number of little, little steps that one should go through every time one uses the Veress needle. First, make sure that the needle is patent, by injecting saline through it. Second, make sure that its spring-loaded blunt tip is working well. Select an appropriate site in the abdomen, distant from any previous surgical incisions and make a skin stab incision which will easily admit the needle tip without the skin catching on the needle. Make sure that the insufflation is low (one liter per minute), with maximum insufflation pressure (20 mm Hg). Holding the needle in mid-shaft like a dart or a pen, insert the needle vertically at right angle to the skin. Some surgeons prefer to grab or pinch the anterior abdominal wall and lift it up in an attempt to increase the distance between the abdominal wall and the abdominal viscera. However, we believe this is counterproductive. The only thing that this maneuver achieves is lifting up the subcutaneous fat, thereby actually increasing the distance between the skin and the peritoneum, which

itself stays in relatively the same position. As such, we believe that this maneuver actually increases the degree of difficulty of Veress needle insertion. The Veress needle should be inserted gently with the abdominal wall in neutral position, being on the look out for two distinct pops, one for the fascia and the second for the peritoneum. The drop test is then done (aspirate, inject 5 cc and re-aspirate) to evaluate the needle-tip position. Finally, easy egress of the drop in the needle into the abdominal cavity under gravity is a good sign. However, none of these tests are fail proof. The one thing never to do is to move the needle in a circular manner to evaluate freedom of its tip in the abdomen. Obviously, this can cause critical and grievous injury to internal abdominal organs and blood vessels. Thereafter, insufflation is started at a low flow state as mentioned above. Initial pressures should be less than 10 to 12 mm Hg. Also, generalized tympany should result rather than asymmetric localized tympany, which indicates that the needle tip is in the wrong place. Once low pressures and generalized tympany have been confirmed, the flow rate is then increased to maximum.

How Does One Get Laparoscopic Access into a Previously Operated Abdomen?

Dr. Gill

There are essentially three ways to go about it. First, if transperitoneal laparoscopy is intended, you can go in with the open (Hassan) technique, where an open

cut-down is made for placement of the primary port. In this manner, the planned port is placed under vision, thereby minimizing access-related injury. However, it's important to keep in mind that even with the open technique you can still create a bowel injury; it has been reported in the literature. The second option for transperitoneal access would be to perform close entry with a Veress needle, my preferred approach. However, significant prior laparoscopic expertise is necessary before one undertakes this. The important point in this regard is to select the quadrant in the abdomen which is furthest away from the abdominal scar. So, for example, if a patient has had an appendectomy with the scar in the right iliac fossa, the initial Veress needle entry should be in the right or left hypochondrium. I would prefer the right, because on the left side, one can potentially cause a Veress injury of the spleen, which is a serious injury. The third option is to avoid the peritoneal cavity completely, and perform the procedure by the retroperitoneal laparoscopic technique. However, adequate expertise with retroperitoneal laparoscopy is essential. Another option would be to obtain retroperitoneal access, put in the laparoscope, and then under vision, create a large peritoneotomy and put in the transperitoneal ports under retroperitoneoscopic visualization, and finally convert to a completely transperitoneal procedure.

Dr. Raju Thomas

We now perform advanced laparoscopic procedures, sometimes in patients with previous abdominal surgery, such as ileostomy, colostomy, or following other surgical

procedures. Tricks used to stay out of trouble, if you get an off-site access, are—

1. If the previous incision is in the mid-line, for example, you enter on the side and location of the abdomen furthest away from the previous incision;
2. I only use a blunt trocar system to gain access. I prefer the Step® trocars. Once you know you are in the right place, after placing your laparoscope, if there are no adhesions, you are lucky. However, in most cases you are faced with adhesions. What we recommend at this stage is to use the teaching laparoscope, which is an off-set laparoscope and has a working channel similar to an off-set nephroscope (Figure 1.5). I use the working channel of the off-set laparoscope to dissect myself out of these adhesions and get enough working space through a single port without having to place additional ports. I use the laparoscopic scissors through the working channel of the teaching off-set laparoscope to gain space and then I am able to place

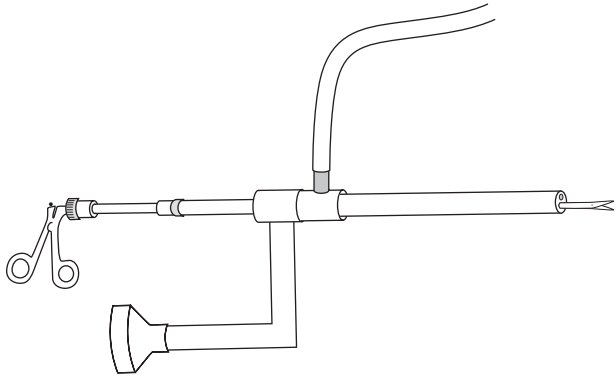

Fig. 1.5 Operating laparoscope.

a second working port. This is a trick I have found very useful.

How Do You Achieve Port Placement for Transperitoneal Surgery?

Dr. Wolf

Port placements are always very hard to convey from one surgeon to the next, even with diagrams. Describing them relative to anatomical landmarks is more helpful than using absolute terms. For a hand-assisted nephrectomy, I put my primary 12-mm port one or two fingerbreadths lateral to the hand-assistance device, given my typical peri-umbilical incision for the hand-assistance device. The 12-mm working port is placed on a line from the primary port toward the ipsilateral shoulder, approximately two fingerbreadths below the costal margin. This reference gets the working port in the right spot on most occasions, regardless of patient morphology (with the exception of very obese patients, where the hand-assistance device is placed more cephalad and lateral). I like to have a third port, 5 mm, for all cases—it allows the assistant to provide counter traction. The placement of this port is less critical, as long as it is caudal to the primary port and lateral to the working port (Figure 1.6). For a standard transperitoneal laparoscopic nephrectomy, the primary port is placed on the lateral edge of the rectus abdominis muscle in line with the umbilicus. For the working and assisting ports I again advocate relative rather than absolute port placements. Here, draw

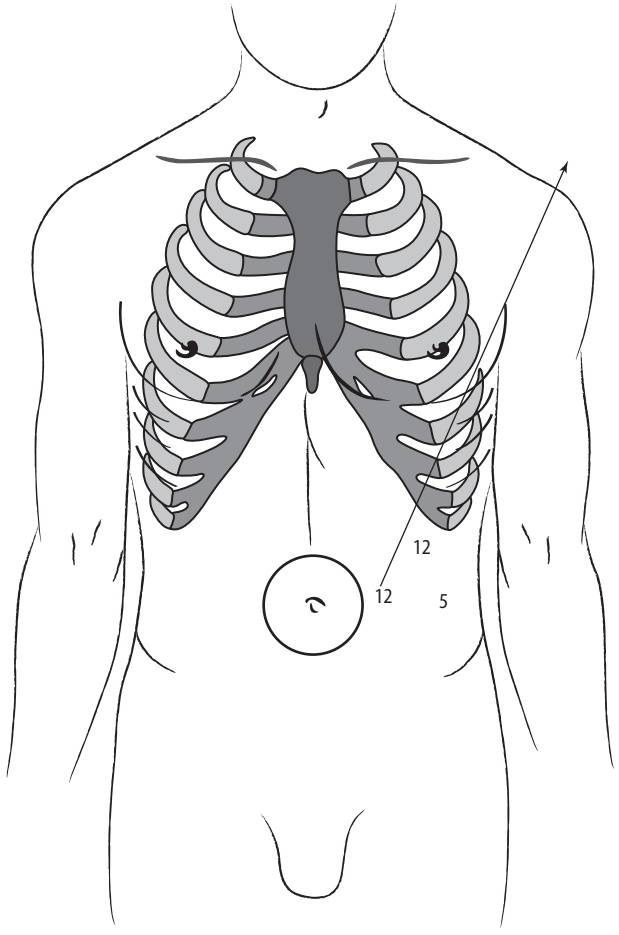

Fig. 1.6 Port placement for hand-assisted nephrectomy.

a line from the xiphoid process to the anterior superior iliac spine. Three ports are placed along this line: cephalad, on the border of the rectus sheath (5 mm); caudal, slightly below the level of the primary port (5 mm); and one in between these 2 ports (12 mm) (Figure 1.7).

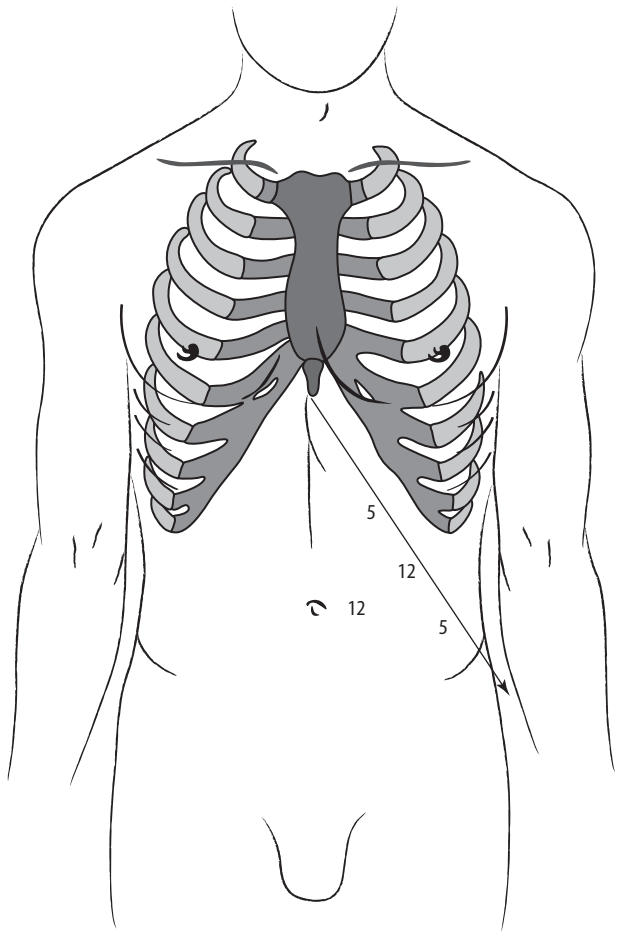

Fig. 1.7 Port placement for transperitoneal nephrectomy.

When Using the Retroperitoneal Approach, What Do You Do in Cases When the Space Between the Iliac Crest and the Lower Ribs is Very Narrow?

Dr. Jens Rassweiler

There are two points. The space usually opens up when you inflate the retroperitoneal space with Carbon Dioxide. The second point is that a supra-costal port might make sense. If we are going to use the supra-costal port primarily, then we would put the lower port first, trying to create space and then placing the supra-costal port under vision. I don't use the balloon; to me it is not necessary. I dissect just with a finger and complete the rest of the dissection with instruments.

How Does One Optimize Port Placement during Retroperitoneoscopy?

Dr. Gill

"Crowding" of ports can be a significant problem during retroperitoneal laparoscopy. As such, adequate spacing of ports is essential. The primary port holding the laparoscope is typically placed at the tip of the twelfth rib. I always create the retroperitoneal space with balloon dilation—it is rapid, easy, and standardized: even the fellows and residents can learn easily. Balloon dilatation has taken the mystique out of retroperitoneal

laparoscopy, which is a good thing. Once balloon dilation has been completed, ports are placed. Two secondary ports are placed, one at the angle of the erector spinae muscle and the 12th rib, and the second at the anterior axillary line approximately two to three fingerbreadths cephalad to the anterior superior iliac spine (Figure 1.8). Typically, this results in the three ports' being placed in a straight oblique line along the undersurface of the twelfth rib with enough separation that virtually no crowding of ports occurs. Again, typically for all retroperitoneal renal and adrenal surgery, these three ports' are employed. Occasionally, an additional 5-mm port is placed anteriorly at the tip of the 11th rib (for partial nephrectomy) to provide traction on the renal parenchymal sutures. All retroperitoneal ports are placed under clear laparoscopic visualization. In our experience, this port placement is efficacious, and we have not experienced the problem of "clashing of swords."

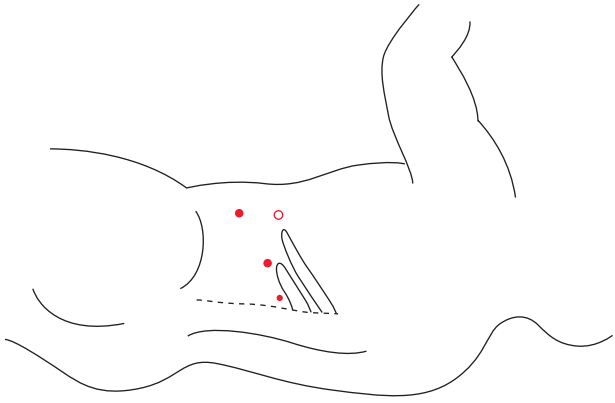

Fig. 1.8 Port placement for retroperitoneal laparoscopy.

Dr. Kumar

One of the problems I face during port placement for retroperitoneal laparoscopic surgery is that the space between the iliac crest and 12th rib never seems adequate! Unlike transperitoneal surgery, where ports can be placed as far away from one another as one likes, one often finds that the space between the lower ribs and the iliac crest is limited, despite flexion of the operating table. Placement of the first port just below the tip of the 12th rib is often the standard approach, followed by a port at the angle between the 12th rib and the paraspinal musculature. Another port is usually placed a few fingerbreadths above the iliac crest in the anterior axillary line.

I have changed these port placements following the advice of Dr. Klaus Jeschke from Austria based on his impressive series of laparoscopic partial nephrectomy cases, all done through the retroperitoneal route. I now place the first port in the angle between the 12th rib and the paraspinal muscles. After balloon dilatation and confirming good placement, I remove the balloon and place the next two ports by palpation, one a few fingerbreadths above the iliac crest and the other supero-medial to the tip of the 12th rib or even above the 11th rib if the space appears very crowded. Despite the theoretical risk of creating pneumothorax when a port is placed above the 11th rib, the risk is minimal when the port is placed anterior to the anterior axillary line.

I use the port between the 12th rib and spinal muscles for the camera (rather than the tip of the 12th rib port as I used to earlier) as I believe this provides a more direct view of the renal hilum and ease of dissection.

Can One Introduce a Needle through a 5-mm Port?

Dr. Francis Keeley

A very simple and seemingly minor tip would be introducing an SH needle through a 5-mm port, which I learned from David E. McGinnis from Thomas Jefferson University Hospital in Philadelphia. Take the free tail end of the suture away from the needle and introduce that through a port. Grasp it with another grasper or needle holder inside the abdomen; pull the needle holder out through the port so that the needle is going in through the port alone. Then drag the needle through the port from the inside. That way you can use nothing but 5-mm ports for a laparoscopic pyeloplasty. Some people find that they need a larger port so they can get a needle in and out and I don't think that is necessary.

Righting the Needle on a Needle Holder Using One Hand

Dr. Keeley

Trying to position a needle on a needle driver can be a frustrating part of the suturing technique. One should find a fairly firm surface such as the kidney or psoas muscle and then loosen the grip slightly on the needle while holding it in the center of the needle. Pushing down into the kidney or psoas will tend to make the needle face up as a smile and so it tends to right the

needle into the needle holder. Of course it takes a little bit of practice but this is preferable to handing the needle back and forth between two needle holders which can bend the needle or just cause frustration. Oftentimes, this is something that you can do with one needle holder, which again is an advantage if you have some tissue in the grasper in the other hand which you would rather not let go.

What Is Your Technique of Specimen Entrapment?

Dr. Wolf

Entrapping the kidney using the LapSac® (Cook Urologic, Spender, IN) for morcellation can be a miserable experience, even with the trick of placing a wire into the holes of the bag to make it somewhat self-opening. With the original morcellation technique described by Clayman, the durable LapSac,® rather than a self-opening but flimsy retrieval bag such as the Endocatch,® must be used in cases of morcellation, because the flimsy bag can be ripped by the morcellator (clamp) very easily. When the self-opening bag was used, which greatly simplifies entrapment, it was thought that the specimen removal had to be intact. Jamie Landman described a great technique that provides the best of both worlds—safe morcellation but in the easy-to-use self-opening bag.[2] After entrapping the specimen in the self-opening bag, bring the neck of the bag back up through the port site, and then enlarge the incision just enough so that you can actually see within the bag. Then you grab and

morcellate only the tissue that you can see; it is a more rapid process because you can remove bigger pieces. You are not blindly morcellating, which would be unsafe in a flimsy plastic bag, but rather you are morcellating under vision. Dr. Landman's data suggested that this was safe, and our experience is similar. For most patients you are only going to enlarge that incision to about 2.5 to 3 cm wide. If you had started with a 12-mm diameter port at that site, the length of the skin incision is 18 mm (assuming that the skin did not stretch). So you have added about 50% to the length of the small incision, and now you can easily entrap the specimen and then morcellate quickly under direct vision. I doubt if most patients are bothered by the extra 7 to 12 mm on one incision.

How Do You Exit the Abdomen?

Dr. Laguna

We have found the Bercy needle (or similar) extremely useful to place the fascial stitches under vision before desufflating the abdominal cavity.

Do You Perform Fascial Closure of the Port Sites after Retroperitoneoscopy?

Dr. Wolf

I rarely do intact extraction in association with retroperitoneoscopy, and as a result am faced with the challenge

of closing the fascia through a 2-cm primary port site incision. Following a retroperitoneoscopic radical nephrectomy on a morbidly obese patient, the fascia may be more than 5 cm deep, and working through a shorter (2 cm) incision to close from the outside is very challenging. A needle-suture passer such as the Carter-Thomason device is unwieldy to use under laparoscopic guidance in the small working space of retroperitoneoscopy, especially since the incision is too large to close with a simple suture and either a pair of sutures or a figure-of-eight suture is needed. We've learned to do it with finger-guidance (Figure 1.9). Looking back at the primary port site from the most medial port (a 5-mm 30-degree lens will be needed, if there are only 5-mm ports medially), the closure device can be directed with a finger down through the fat and to catch a generous bite of the lumbodorsal fascia. The suture is dropped off, the device is removed and reinserted on the other side, and the suture is grasped and pulled out to complete the first half of a figure-of-eight suture. This technique has allowed us to close these fascial defects through 2-cm skin incisions, which otherwise would have been very hard to close without opening the skin incision for visualization. Before we figured this out, we gave up closing the fascia on a few obese patients, and at least 2 patients (of approximately 30 until we altered our technique) developed flank hernias at the site.

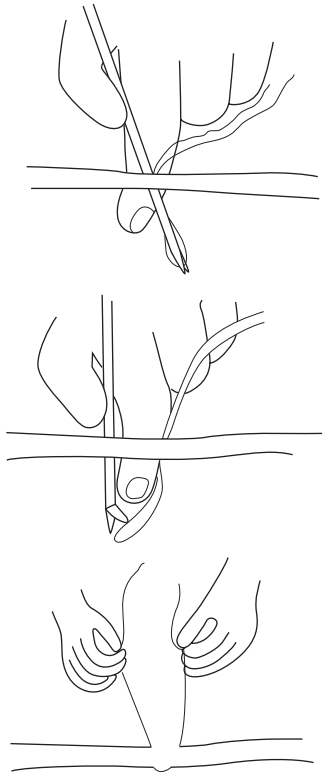

Fig. 1.9 Finger-guided use of the Carter–Thomason device.

What Are Your Favorite Instruments?

Dr. Suzuki

The combined suction/irrigation/ electro-cautery device can be used for dissection also. Often, it is useful to perform suction and dissection simultaneously with this device. Nowadays, we have started using the electro-cautery hook on 80–100 W power. This is very high power

indeed, but if one is careful, it provides a nice tool for dissection. In areas such as the posterior surface of the kidney, where there are few important structures, one can use it effectively. I have observed Dr. Menon use such high-power (120 W) cautery in robotic laparoscopic radical prostatectomy very effectively, and I have adopted this technique in my surgery also. (Editors' note: The editors do not recommend monopolar coagulation at settings above 55 W as they believe that higher settings increase the potential for unrecognized thermal injury to bowel).

Dr. Gill

For renal and adrenal surgery, I typically like to use the atraumatic small bowel grasper in my left hand for retraction and exposure purposes and variably use the right angle J-hook monopolar electrode, the Stryker smooth suction tip, or laparoscopic endoshears in my right hand (I am right-handed). During prostatectomy, the left hand typically holds the small bowel grasper or the locking Allis clamp while the right hand typically employs the J-hook or the Harmonic scalpel. For suturing, I prefer the Ethicon® straight-locking 5-mm needle driver.

Dr. Yoshinari Ono

My favorite instrument is the "D" retractor, the one that forms like a circle within the abdomen. The coat-hanger type retractor is a little too large. The "D" retractor is

more round. Also, functionally it is very important for removal of the lymph nodes. For dissection we usually use the ultrasonic scissors and the curved dissecting forceps.

Dr. Stoller

Everyone asks what instruments you would take with you if you had to perform a procedure outside your own hospital. We all have our favorite instruments. The cigarette sponge is one of mine. The laparoscopic cigarette-sponge (Kittner Rolled Gauze—Carefree Surgical Specialties, Inc., 450 Main St. New Castle, CA 95658, ph. 916-663-4082) is a key tool for multiple aspects of laparoscopy. It is a pre-rolled 4 × 4 gauze with umbilical tape that does not get stuck on the valves of the laparoscopy port. They come in sets of five and are very useful.

First, you can place this sponge through a 10-mm port. It is easier to soak up peritoneal fluid, lymph, urine, or blood with a sponge than to utilize suction that decreases the pneumoperitoneal pressure and decreases the image quality. If there is bothersome oozing, you can pack it with a sponge and leave it there, just as you would in open surgery, and then come back later to address it. You can use it on a grasper just as a sponge on a stick is used in open surgery, to help with blunt dissection of the colon. During a difficult nephrectomy where you are trying to define the anterior and the posterior aspect of the dissection, placing a cigarette-sponge behind or in front of the hilum as you flip the kidney back and forth

(as with a donor nephrectomy) allows you to have an idea of how much further your dissection needs to go. You can also estimate how much blood loss you have. You can take them out and squeeze them to get an idea of how much blood is there.

An important aspect is to be sure that you remove all the sponges you put in. We will frequently have put ten sponges in at a time to help with packing. You must keep track of where those sponges are. If you are doing a donor nephrectomy or morcellating a kidney, it is important to take the sponges out before you start to remove the specimens. They will be difficult to find after the loss of the pneumoperitoneum. Cigarette sponges have a radio-opaque marker woven in them, so if there is a question of inability to find one, you can get an x-ray. I think the cigarette sponge is something everyone should use.

Dr. Kumar

I find the long packing gauze (Fabco ORS, First Aid Bandage Co. Old Mystic, CT) particularly useful to absorb blood or other fluid, as well act as a tamponade if bothersome ooze occurs during dissection. Since it is available in 0.5- and 1-inch widths, the gauze can be cut to the required length and easily inserted through one of the ports. As it comes with a radio-opaque marker, it is easy to locate radiographically should it become necessary. With hand-assisted laparoscopy, of course, it is easy to place a large lap sponge through the hand incision.

What Are Some Tips on Minimizing Costs for Laparoscopic Surgery?

Dr. Jeffrey Cadeddu

The most important things are, of course, comfort in doing the procedure and the patient's safety and a good outcome. As one develops experience, I believe there are ways to reduce the cost of the procedures in every aspect of the operation. Beginning with access and trocars, one can obviously use reusable trocars and that reduces cost. In terms of doing the dissection, I do not use the harmonic scalpel for any of my procedures, though it is advocated by some, particularly general surgeons, because it adds a $300 cost to every operation. For such cases as nephrectomy, I don't see how a harmonic scalpel is very useful. One just has to be more meticulous in application of bipolar or monopolar energy in the dissection rather than just cutting through, slowly, with the harmonic scalpel. Other means of reducing cost is in the technology used for hemostasis. I have switched now to Hem-O-Lok® clips whenever possible. Not necessarily because they are more efficacious than regular clips but because they cost about 60% less than metal clips and so it is also a significant way of reducing cost. Postoperatively it is pretty clear that it is beneficial to avoid narcotics, which can contribute to a slightly longer time to return of bowel function and so necessitate a longer postoperative hospital stay. Preparing the patient psychologically for going home the next day and early return of bowel function by using nonsteroidal anti-inflammatories for pain are the most important perioperative factors.

How Does One Retract the Liver and the Spleen during Renal or Adrenal Laparoscopic Surgery?

Dr. Gill

In my view, the safest and best way to retract the liver is to retract from medial to the lateral side. In other words, the instrument retracting the liver should be inserted high in the midline of the abdomen near the xiphisternum and carefully passed along the undersurface of the liver towards the lateral sidewall. Care must be taken to avoid injury to the gall bladder. Various instruments can be used to retract the liver, e.g., fan-retractor, "snake-retractor," etc. However, we have found that the simplest way to achieve this is by using a locking Allis 5-mm clamp inserted through a high midline port near the xiphisternum, passed under the liver, to grasp the lateral abdominal wall at a desired location. The Allis clamp is then closed and locked, thereby creating a self-retaining retractor that does not require an assistant to hold it (Figure 1.10). It stays out of the way and keeps the liver adequately retracted. On rare occasions when the liver is extremely large, two such graspers can be passed through ports placed adjacent to each other. Caution: retracting the liver using an instrument passed from lateral to medial or from an instrument passed from an inferiorly placed port is dangerous. The angle of retraction of the liver is inadequate from such a direction, and there is a real danger of lacerating the liver.

As regards the spleen, there is no good way to retract the spleen adequately during a left-sided renal/adrenal

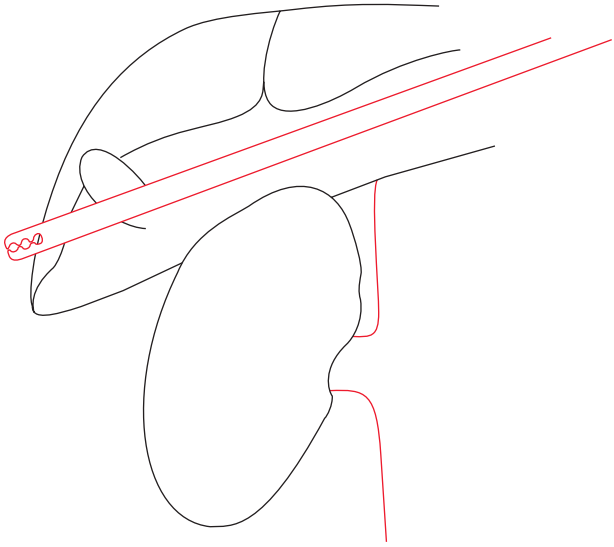

Fig. 1.10 Retraction of liver using an Allis locking clamp.

laparoscopic procedure. The best thing to do is to mobilize the spleen as thoroughly as is safe and feasible. While mobilizing the spleen, care must be taken not to tear the splenic capsule or to injure the diaphragm. Further, as the lateral peritoneal incision around the spleen is developed cephalad, one can occasionally run into the greater curvature of the stomach, which should be guarded against. In our experience, extensive and high mobilization of the spleen is readily performed laparoscopically, similar to open surgery. Care must be taken to do this slowly. Excellent hemostasis must be achieved every step of the way, since one is typically working at the very extreme of the instruments' length. Not infrequently, despite such extensive mobilization of the spleen, it still is in the way while performing dissec-

tion of the renal hilum. The safest way to retract the mobilized spleen medially is to insert a 10/12-mm port in the suprapubic area, low down on the abdomen. A 4 × 18 lap sponge is inserted, the pancreas and spleen carefully padded, and then a three-pronged standard fan retractor is inserted through this suprapubic port to retract the padded structures medially. Medial retraction of the spleen with an instrument inserted through a lateral port is extremely dangerous and has a high chance of causing splenic injury.

How Do You Select the Appropriate Suture for Laparoscopic Suturing?

Dr. Gill

Selection of the laparoscopic suture depends on the color, texture, memory, and length of the suture and the shape and size of the needle (Figure 1.11). A laparoscopic suture should be easily visible laparoscopically. It should have minimal coil memory. It should be easy to handle laparoscopically. It should not have excess length, which leads to unnecessary intertwining within the abdomen, significantly increasing the level of technical difficulty. From a personal standpoint, the dyed (violet) Vicryl® or Monocryl® are desirable sutures for laparoscopic surgery. Conversely, a Prolene® suture is much more difficult to handle. Typically, the suture is cut to the length of the port, which is usually long enough for most laparoscopic suturing, while still being readily manageable. With regard to needles, different shapes and sizes

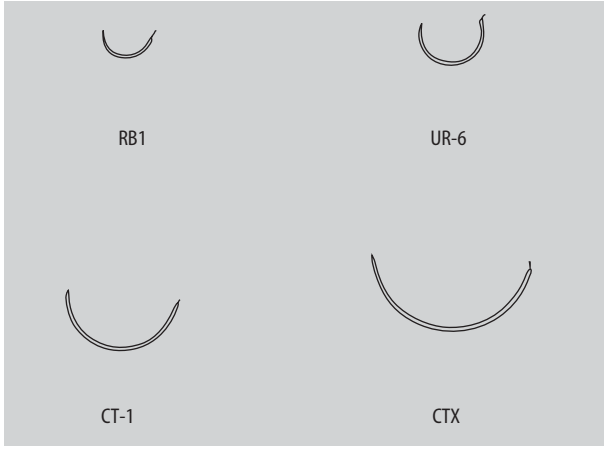

Fig. 1.11 Selection of needles for laparoscopic suturing.

of needles are required for different suturing situations. Furthermore, needle preferences vary according to the individual surgeon. Personally speaking, a UR-6 needle is optimal for the urethrovesical anastomosis during laparoscopic radical prostatectomy because of its 58th curve, allowing ease of handling. Typically, we employ a 2–0 Vicryl® suture on a UR-6 needle for the urethrovesical anastomosis. The same applies for the urethro-ileal anastomosis of a laparoscopic orthotopic neobladder. For dorsal vein ligation, we employ a CT-1 needle on 2–0 Vicryl. The same stitch is used for laparoscopic bowel suturing. For laparoscopic uretero-intestinal anastomosis, we employ an RB-1 needle on 4–0 Vicryl. This is the same stitch that is employed for laparoscopic dismembered pyeloplasty. During laparoscopic partial nephrectomy, we employ a CT-1 needle with 2–0 Vicryl for watertight suture-repair of the pelvic calicyeal system and parenchymal suturing for hemostasis. For renal

parenchymal re-approximation over a bolster, we employ the CTX needle with O-Vicryl® suture. The need for vascular suturing during urologic laparoscopy is rare, and is usually done on an emergent basis. Considerable laparoscopic experience is required to perform emergent vascular suturing for hemostasis. In such circumstances, we have preferred the CT-1 needle with 2–0 Vicryl® to control the site of hemorrhage from the vena cava expeditiously.

What Are Your Tips for Laparoscopic Surgery in Obese Patients?

Dr. Gill

The patient should be clearly informed that his/her chances of open conversion are somewhat higher than a normal patients. Also, have extra-long morbid obesity laparoscopic instruments available. Place as many ports as are necessary to do the procedure safely. Finally, it is very important to maintain anatomic orientation along clear anatomic planes. As long as proper orientation is maintained, the operation can be performed safely despite the *volume of fat*. We have had good success with the retroperitoneal approach to renal surgery in the obese patient.

Dr. Stoller

We use the hook cautery very frequently for dissection and I did not realize that there were different lengths of

the hook cautery available. I think that different lengths for the hook cautery are critical, especially for obese patients.

Dr. Albala

For nephrectomy work, I have found that moving the trocars off the midline in obese patients toward the kidney allows the renal dissection to be done more easily. If a hand-assisted procedure is being done on a very obese patient, the hand incision needs to be closed in an interrupted fashion. We have had one dehiscence and one hernia that developed when we did a running closure. I think that closing the incision in an interrupted fashion in an obese patient is extremely important. In addition, all our obese patients wear an abdominal binder for one month postoperatively. We feel this places less stress on the incision site and allows for better healing. This is commonly done by our general surgery colleagues when they operate on obese patients. A midline incision tends to be a little stronger than a paramedian incision and these are always closed in an interrupted fashion.

Do You Have General Tips for the Residents?

Dr. Rassweiler

When I work on the prostate, usually I handle the bipolar diathermy with the left hand, and the scissors with the

right. I am not a "hook-man," like others! For me the main instruments are the bipolar dissector, scissors, and the right-angle dissector. I only seldom use the peanut dissector. My principle in surgery is to cut whenever you can; and laparoscopy allows you to see very nicely where you can cut. When one does blunt dissection, one doesn't know exactly where one is. Of course, around vessels you may use (the peanut for blunt dissection), but I very much like to use the suction device as a blunt instrument for dissection. So there are only a few cases where I think that the peanut is really helpful. It was different in the beginning, but I must say now with increasing experience I prefer to cut wherever I can.

For renal surgery it is similar but you cannot use bipolar diathermy like prostatectomy because usually it is a three-port technique. So, though I prefer the bipolar diathermy, we do not use it in kidney surgery, because if you do, then you have to switch over to the scissors just to cut after you coagulate something. I tell this to my residents, because they see us operating on the prostate and then try to do the same in renal surgery.

One problem is changing your field too often. What I prefer is for the left hand to retract while the right hand acts. For the sake of time management, the left hand is kept stable while the right hand is active. For example, incise with the right hand; do bipolar coagulation (with the left hand) and incision again with the right hand. What one has to learn from the beginning is the "one hand feeds the other technique." Whatever you do, keep the image still. And then one hand feeds the other.

One more point is that there should not be too much emphasis on keeping the three-trocar setup. The addition of a fourth trocar is usually not a problem. One

could use a 3-mm trocar if necessary, but a 5-mm trocar also does not hurt much more. So you should insert an additional port whenever you feel you are not comfortable with the exposure. I think this is very important.

Dr. Lou Kavoussi

Beginners in laparoscopy are tense and tend to raise the table high, as in open surgery. Actually, it is better to drop the table lower because that brings your elbows in, increasing operator comfort. If the elbows are positioned high up, then one is using one's back and shoulder muscles to hold the arms up, which reduces precision. It is much more comfortable operating with the elbows tucked at the side and just using the forearms and wrists. This is the most common mistake that residents and fellows do when beginning to operate; they do a sort of "chicken stance" with their elbows out. One should lower the table and keep the elbows in.

References

1. Khaira, H.S., Wolf, J.S., Jr.: Intraoperative local anesthesia decreases postoperative parenteral opioid requirements for transperitoneal laparoscopic renal and adrenal surgery: A randomized, double-blind, placebo controlled investigation. J Urol **172:** 1422, 2004
2. Landman, J., Venkatesh, R., Kibel, A., et al.: Modified renal morcellation for renal cell carcinoma: Laboratory experience and early clinical application. Urology **62:** 632, 2003