"LAPAROSCOPY IN UROLOGIC SURGERY"

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Ignored for decades by urologists, Laparoscopy has finally entered urology as a subspeciality, within a decade. The skilled laparoscopic urologist can now effectively replace many incisional procedures. This aspect of urologic surgery is rapidly developing; its potential is limited only by the urologist's imagination. In the coming years, our methods of urologic practice will change dramatically. The necessity to harm in order to heal will be supplanted by laparoscopy.

Laparoscopy surgery has the advantage of endoscopic surgery (less invasive nature) and the advantage of open surgery which is used for the removal and reconstruction of various organs . Thus, transfering benefits of early post-operative recovery, less hospital stay and early recuperation.

I. History -

The first urologic application of laparoscopy was localization of cryptorchid testis in adults. This was reported in 1976 by Cortesi. Wickham first performed laparoscopic ureterolithotomy in 1979. Schussler et al in 1991 first described laparoscopic lymphadenectomy for staging prostate cancer. The first laparoscopic nephrectomy was reported by Clayman and associates in 1990. Since then almost all urologic procedures that were being performed by open surgery have now been described laparoscopically. Retroperitoneoscopic surgery came into vogue in 1993.

II. Access –

Laparoscopic urologic procedures can be performed either transperitoneally or retroperitoneally . In the transperitoneal approach, the anterior abdominal wall musculature is traversed by anterior

ports and the line of Toldt is incised to reach the kidneys. To approach the kidney retroperitoneally, laparoscopic entry is via the superior or inferior lumbar triangle.

The Urologic surgery is mostly retroperitoneal and extraperitoneal as these organs are located inherently in the retroperitoneum. However, with the advent of laparoscopic surgery, urologist once again found it necessary to traverse the peritoneal cavity in order to provide their patients with the benefit of this less invasive type of surgery. Creativity and preservence led to use of laparoscopy vide retroperitoneal approach. The concept of balloon dilatation of retroperitoneum was introduced by Gaur thus subsequently leading to growth of retroperitoneoscopy.

Advantages of Retroperitoneal approach

1. It can be done safely even in patients, who have undergone multiple intraperitoneal interventions previously.
2. Less port sites are needed as retraction can be done from one trocar only (bowel retraction is not needed)
3. Less operative time. In transperitoneal approach more times is required as the position of the patient has to be changed from supine to lateral position after creation of pneumoperitoneum and mobilization of gut is required before exposing the kidney.
4. Less operative complication. With transperitoneal approach there is risk of injury to intraperitoneal organs like bowel and spleen during retraction.
5. No risk of development of intraperitoneal adhesions at a later date.
6. No risk of spillage of infected urine and content of kidney into the peritoneal cavity.
7. This approach is familiar to all urologist.

Disadvantages of retroperitoneal approach.

1. Less working space available for dissection and there is difficulty in dissecting large hydronephrotic kidneys and large renal tumors, however other authors have not found it true in all cases.
2. Longer learning curve.

3. Although there are certain advantages and disadvantages of both the approaches, in a particular patient, the ideal approach should be individualized. Both the approaches are safe and complimentary to each other.

III. Indications

I. Adrenal
- Adrenalectomy for benign tumours
- Phaeochromocytoma
-Simple adrenal cyst. Myelolipoma,
-Angiomyelolipoma

II. Kidney
- Nephrectomy for benign diseases.
- Radical Nephrectomy for Renal Tumors
- Nephro-ureterectomy for benign and malignant diseases
- Nephropexy
- Renal Cystic disease
- Pyelolithotomy
- Pyeloplasty
- Donor Nephrectomy
- Partial Nephrectomy

III. Ureter
- Ureterolithotomy
- Ureterolysis
- Correction of vesico-ureteric reflux
- Ileal replacement of ureter

IV. Bladder
- Diverticulectomy, Augmentation, Radical Cystectomy, Simple Cystectomy.

V. Prostate
- Radical Prostatectomy

- Intravesical correction of vesicoureteric reflux

VI. Miscellaneous
- Varicocelectomy
- Lymphadenectomy (Transperitoneal and retroperitoneal access) for pelvic malignancies
- Chyluria
- Removal of foreign bodies

VII.
- Management of Stress Urinary Incontinence
- Sacral Colpopexy
- Diagnostic
- Repair of vesicovaginal and vesicouterine fistula

VIII.
- Diagnosis and orchiopexy for cryptorchid testis
- Undetermined sex and Ambiguous genitalia

IX. Urinary Diversion
Conduit formation
Ureterostomy
Ureterosigmoidostomy

IV. Contraindication

The following is the list of absolute and relative contraindications of laparoscopic surgery. These are mainly for transperitoneal access.

A. Absolute contraindication

1. Uncorrected coagulopathy
2. Peritonealor an abdominal wall infection
3. Significant ileus or bowel obstruction
4. Severe cardiac or pulmonary diseasc.

B. Relative contraindications

1. Significant prior abdominal surgery.
2. Veress needle placement in the face of an abdominal aortic or iliac aneurysm (as it increases the risk of vascular injury.)
3. Previous retroperitoneal surgery and XGPN are contraindication for retroperitoneal laparoscopic surgery

Before undertaking any laparoscopic procedure the patient should be explained the risk of the procedure. The risks include common general risks (wound infection), uncommon risks (vascular and enteric injury) and catastrophic riks (death). The patient should clearly understand that the procedure can be converted to open surgery at any point of time.

V. Overview of Laparoscopic Urological Procedures

Although many urological procedures have now been performed laparoscopically there are some which have almost established themselves in routine practice now. Such common procedures include renal cyst decortication, simple nephrectomy, radical nephrectomy, ureterolithotomy, pelvic lymph node dissection, surgery for stress urinary incontinence, surgery for undescended testis and recently donor nephrectomy. The another interesting area emerging is laparoscopic radical prostatectomy and cystectomy.

a) Adrenal Gland-

Laparoscopic approach to adrenal gland have been used for various benign adrenal diseases . Laparoscopic surgery for malignant adrenal diseases is still controversial. Current indication for laparoscopic adrenalectomy include nonfunctioning adenomas, phaeochromocytoma, Cushing's disease, aldosteronoma. Angiomyelolipoma and medullary cysts of adrenal gland. Open surgery is recommended for large (>6cm) functioning adrenal neoplasms and malignant neoplasm.

Gasman et al (1996) reported retroperitoneoscopic adrenalectomy in 8 patients. Five patients had aldosteronoma and 3 patients had Cushing's syndrome. The average adrenal tumor size was 31mm (range 20 to 40). The average operating time was 84 minutes (range 45 to 140), and average

hospital stay was 2.4 days (range 1 to 4). The average blood loss was 65 ml . No patient required conversion to open surgery. No complication was reported.

We have performed 14 adrenalectomies in patients with phaeochromocytoma, Conn's disease, and myelolipoma and adrenal cyst with good results.

b) Kidney and Ureter -

Simple Nephrectomy and Nephroureterectomy

We have performed nephrectomy and nephroureterectomy for benign diseases in patients since 1994 in over 200 patients. The indications have included nonfunctioning kidney due to pelviureteric junction obstruction, stone disease, renovascular hypertension, tuberculosis . This also included patients of various congenital disorders like horse-shoe kidney, ectopic kidney, vesico ureteric reflux and megaureter. Our conversion rate has been 8.5%. We have been able to complete the procedure successfully even in patients on nephrostomy, and patients with pyonephrosis and previously operated cases. The specimen was removed intact by extending one of the port site incision to avoid the cost of various organ entrapment sacs and tissue morcellators.

Radical Nephrectomy

The indications for removal of those kidneys harbouring malignancy are less clear. These organs are best removed intact by extending the port site incision. This allows adequate staging and grading of the tumour and reduces the risk of tumour spillage or tract seeding . In general, patients with tumours ≤ 8cms and without renal vein or caval involvement, are considered candidates for laparoscopic nephrectomy. Location of tumour in relation to kidney is not a factor to consider in removal of kidney.

Ono et al (1999) have compared the results of open and laparoscopic radical nephrectomy in a group of 100 patients treated from 1992-1998. 60 patients underwent laparoscopic and 40 patients underwent open surgery. There was only one conversion in laparoscopic group. The calculated blood loss was less than in open surgery. There was faster recovery and shorter hospital stay in the laparoscopic group.

Abbou et al (1999) reviewed 58 consecutive patients of radical nephrectomy. Twenty nine underwent open radical nephrectomy and 29 underwent laparoscopic radical nephrectomy. The laparoscopic radical nephrectomy group had significantly less operative blood loss, required less pain medication, had shorter hospital stay and had less complication rate as compared to open

radical nephrectomy group. They recommend that laparoscopic approach is effective and safe for tumours less than 5 cm. In our centre, we are carrying out comparison of retroperitoneoscopic radical nephrectomy with open surgical nephrectomy as a pilot study and have performed over 15 cases.

Stone disease

With the development of extracorporeal shock wave lithotripsy (ESWL) and percutaneous nephrolithotomy (PCNL) the indications of open surgery have shrunken considerably. In those patients in whom there is an indication of open surgery laparoscopic approach has been used. Fourty three ureterolithotomies and 6 pyelolithotomies have been performed in our department., only in those cases where open surgery was contemplated. This is one area, where there is great scope in our country especially patients presenting with large size stones.

Chyluria

Operative lymphatic disconnection is indicated once conservative measures and sclerotherapy fail to cure the patient. We have performed pyelolymphatic disconnection in 7 patients and have been successful in all of them. The average operative time was 114 mts (range 95-145 mts) and blood loss was 125 ml. There were no major complications.

c) Laparoscopic lymphadenectomy- Retroperitoneal lymphadenectomy for testicular tumour is being done effectively and successfully

Pelvic lymphadenectomy can be performed safely and expeditiously. For prostate cancer it is now being performed extraperitoneally. It has been shown in many studies that the staging effectiveness of laparoscopic approach is comparable to open procedure. It also has role for other pelvic malignancies.

d) LAPAROSCOPIC SURGERY FOR FEMALE UROLOGY

Incontinence procedure- Initial reports of the laparoscopic bladder neck suspension have suggested success rates similar to other traditional bladder neck suspension procedures. The presently accepted theory of continence is that increase in urethral closure pressure during stress maneuvers arise because the urethra is compressed against the hammock-like supporting layer, rather than the

urethra being truly intrabdominal. Delancey suggested that the treatment of female stress urinary incontinence should focus on reconstructing this supporting tissue, not on elevating or repositioning the bladder.

Some investigators have suggested that patients with anatomic stress incontinence may also have an element of intrinsic sphincteric dysfunction, which may compromise the results of the bladder neck suspension procedure. Several investigators have advocated the use of the sling urethropexy for all patients with SUI to improve long term success rates of surgical intervention. At the present juncture isolated laparoscopic bladder neck suspension has got limited role, exclusively in patients with anatomical SUI.

1. Laparoscopic sling urethropexy for the patients presenting with type II SUI, the widely accepted technique for surgical maanagement has been the sling urethropexy.

The sling procedure can be performed laparoscopically. Urethra is dissected including periurethral tissue and sling is applied laparoscopically. Continued clinical evaluation of these patients is being maintained in an effort to determine the long efficacy of this surgical procedure for SUI.

2. Laparoscopic management of Vaginal Prolapse.

Massive eversion of the vagina is one of the most disturbing, frustrating, and embarrassing disorders confronting the modern woman. The incidence of the massive vaginal erosion is not well established, but it probably occurs in about 0.5% of patients who have undergone vaginal or abdominal hysterectomy. Massive eversion is a complex disorder, as a result of complete disruption of all elements maintaining normal vaginal position, and usually coexists with other pelvic floor defects. Women with massive eversion may note problems with pelvic pressure, low backache, difficulty in walking, difficulty defecating, urinary retention, frequency and urgency and impaired coitus. The management of massive eversion of the vagina is almost always surgical except in the patient so informed that anesthesia and surgery is contraindicated. Conservative treatement with various kinds of pessary rarely is effective or acceptable to the patient in long term.

The laparoscopic approach to surgical management affords the patient a minimally invasive procedure which can duplicate the technique used at open surgery to attach the vaginal vault to the hollow of the sacrum with either autologous (fascia lata, rectus fascia, cadaveric, etc.) or synthetic (Gortex, Mersilene, or Marlex mesh, etc.) materials.

The laparoscopic sacrocolpopexy technique involves a transperitoneal approach to the pelvis. After complete mobilization of the bowel to expose the sigmoid colon and posterior cul-de-sac an incision is made in the peritoneum just lateral to the sigmoid colon over the mid-line of the sacrum. This dissection is extended through the subperitoneal tissues to expose the presacral ligaments. A 2 cm by 9 cm piece of graft is inserted into the pelvis and sutured to the dissected and exposed apex of the vaginal vault. The graft is trimmed to reach, without tension, the exposed sacral ligaments. An intracorporeal suturing technique or the Origin Tacker can be used to secure the cephalad end of the graft to the sacral ligaments in the midline.

The posterior cul-de-sac is then closed using a purse-string suture commencing at the periotoneum overlying the left uterosacral ligament. The suture is then sequentially passed through the peritoneium overlying the vaginal apex, superior to the line of the fascia to vagina suturing the peritoneum overlying the right uterosacral ligament and then to the cephalad edge of the peritoneum incision overlying the sacrum. Finally the suture is passed through the tinea of the sigmoid colon, and finally through the preformed loop at the end of the suture, and then the suture is firmly pulled through the tissues. As the suture is tightened, the incorporated peritoneum is drawn together closing the space, such that the fascia of the vaginal-sacral suspension is no longer visible. The suture is secure with a Lapra-Ty suture clip.

3. Laparoscopic repair of vesicovaginal and Vesico-ureterine fistula.

Vesicovaginal fistula is commonly encountered problem in our country. Simple supratrigonal VVF can be repaired laparosocpically by separating both bladder and vagina. Interrupted sutures can be applied on either side. An omental twig can be interposed in between.

Similarily vesico uterine fistula can be repaired laparoscopically by separating bladder from uterus and interposing omentum in between to prevent recurrence and make sure shot repair.

Author has experience of reconstructing both the conditions laparoscopically.

e) Paediatric Urology

Laparoscopy has firmly established itself in children with nonpalpable testis. The role is to localize an intra-abdominal testis in the hope of improving incision placement of avoiding intraabdominal exploration. Laparoscopy has been seccessful in localizing or identifying the non-palpable testis in 85-100% patients.

Laparoscopy has been described for intersex patients. It allows complete visualization of pelvic sturcutre, gonadal biopsies can be taken or gonadectomy can be done in patients where indicated.

El-Ghoneimi et al (1998) have reported excellent results in 41 children treated for various renal diseases by the retroperitoneal approach. They performed 31 nephrectomies, 8 partial nephrectomies, 2 renal cystectomies and 1 pyelolithotomy. There were 2 conversion (both in cases of partial nephrectomy)

Hemal et al (1999) reported retroperitoneal approach for nephrectomy, nephroureterectomy and nephrectomy with isthumusectomy in 11 children with no conversion. They concluded that it is safe and effective in children.

f) Role of hand assisted laparoscopy in Urologic Practice

Hand-assisted laparoscopy addresses many of the contemporary concern of urologists who are contemplating performing renal laparoscopy. The return of tactile feel, finger dissection, and

vascular control will facilitate laparoscopic renal surgery for many urologists. Hand assistance may shorten the learning curve and minimize intraoperative complications by allowing less-experienced laparoscopists to dissect rapidly and efficiently and to control problematic bleeding more easily.

The lack of abundant "training" cases has limited many urologists from embracing urologic laparoscopy. Hand assistance allows urologists to attempt more challenging procedures sooner, thereby increasing their caseload. Similarly, hand assistance enables experienced laparoscopists to tackle more complex procedures with greater confidence than they would have using conventional laparoscopy alone.

Cost remains a concern among all practitioners of minimally invasive surgery. It remains a challenge to create a cost scenario in which laparoscopic nephrectomy is to equal to its open counterpart. Prolonged operative time has been a critical element in the increased cost of laparoscopic nephrectomy. Devices such as the Pneumodissector. Endohand, and Endostitch were all created to hasten tissue dissection and shorten operative times. Hand assistance has been quoted in shortening operating room times.

Despite this benefit, enthusiasm for hand assistance must be tempered. Urologists must consider the restrictions of the template on port placement, curtailment of operating space as a result of having a hand in the abdomen, the time required to set up the device, and it cost. The latest version of the Pneumo-Sleeve costs $495.00.

Yet in cases requiring intact specimen removal where an incision must be made (laparoscopic live-donor nephrectomy or radical nephroureterectomy), hand assistance offers significant benefits during the procedure. The first hand-assisted live-donor nephrectomy has recently been reported. Similarly, conversion to hand assistance can be benefical if there is lack of progression of the dissection during a standard laparoscopic procedure. It is clear that hand assistance belongs in the arsenal of the practicing urologic laparoscopist.

g) _Laparoscopic Surgery in Renal Transplantation.

The morbidity of surgical procedures has been reduced with the advent of minimally invasive surgery. The first laparoscopic nephrectomy for a renal mass was performed in 1990 by Clayman et al. In a relatively short period of time the efficacy and minimally invasive nature of this surgery was evident. Since then laparoscopy has been used to undertake a wide variety of urologic surgeries.

Renal transplantation is the only treatment of end stage renal disease that gives the patient a near normal quality of life. The graft and patient survival is better with living than with cadaveric donor renal recipients. The one and five year graft survival for cadaveric allografts is 81% and 59% respectively, compared to 92% and 76% for live donor allografts. In addition the waiting period for the recipients of live donor kidneys is dramatically shorter than the patients waiting for a cadaveric renal transplant. In India the cadaveric program is still in its infancy and live donors form the bulk of all renal transplants.

The major disadvantage of living donors is that a healthy person must undergo a major surgical procedure. It is also of paramount importance that surgery poses minimum risk to the healthy patient. The disincentives associated with donation include factors such as prolonged hospitalization, post-operative pain and the cosmetic results of major abdominal surgery. The other major indication for laparoscopic surgery in renal transplant patients is in the management of post-transplant lymphoceles.

The technique of laparoscopic live donor nephrectomy in humans was first developed by Ratner et al in 1995. Since then several investigators have reported their experience with this procedure (4,5,6). Laparoscopic live donor nephrectomy has resulted in decreased hospital stay, less post-operative analgesic requirements and an earlier return to normal activities.

PATIENT SELECTION

The donor is carefully evaluated for emotional stability, motivation and undergoes a battery of investigations including radiological and histocompatibility tests. The preoperative evaluation can vary somewhat among the different transplant centers. It is done to ensure that the patient has both normally functioning kidneys and will have normal renal function after unilateral nephrectomy.

During the preoperative evaluation delineation of the vascular anatomy is of paramount importance for laparoscopic surgery. As compared to open surgery, laparoscopic live donor nephrectomy requires a higher degree of resolution of the venous anatomy. Of late, dual phase spiral CT with three-dimensional angiography is being used for pre-operative evaluation. Smith et al have shown that CT angiography adequately depicts the renal vascular anatomy.

OPERATIVE PROCEDURE:

Both the transperitoneal and retroperitoneal approaches can be used to do laparoscopic live donor nephrectomies.

Transperitoneal approach:

This approach is similar to the one described by Fabrizio et al. The patients do not undergo any preoperative bowel preparation. The procedure is done under general anesthesia under broad-spectrum antibiotic cover. The bladder is catheterized preoperatively and the patient placed in modified flank position with 45-degree lateral decubitus tilt. Veress needle is used to create the pneumoperitoneum, and initially three transperitoneal laparoscopic ports are placed. The first port is placed laterally at the level of the umbilicus, the second in the midline between the umbilicus and the xiphoid while the third is placed at the umbilicus. Insufflation of the peritoneal cavity is upto 15 cm of water. A thirty-degree laparoscope is introduced through the umbilical port.

The patient is kept volume expanded during the procedure in order to improve renal blood flow and reduce the effects of increased intraperitoneal pressure. Using the two operating ports the ipsilateral colon is reflected medially beginning at the splenic flexure going down to the sigmoid colon, incising along the line of Toldt. The phreno-colic ligament must be divided to allow the colon to be completely reflected medially. The linorenal and splenocolic ligaments at the inferior border of the spleen are divided, allowing the spleen to be retracted superiorly as needed. The Gerota's fascia is exposed and the upper pole of the kidney is mobilized within the Gerota's fascia. This is done by blunt dissection using the suction tip. During this part of the procedure there is risk of injury to the kidney, spleen and

renal hilum. The hilar vessels come into view once the upper pole of the kidney is freed. Gerota's fascia is incised on the medial aspect of the kidney and the renal vein is dissected. The adrenal, gonadal and lumbar veins are identified and ligated. The renal artery is now identified posterior to the vein and freed upto it's proximal origin at the aorta. Topical papavarine may help prevent renal arterial spasm during the dissection.

The lateral, posterior and inferior attachments of the kidney are left intact in order to prevent torsion of the vascular pedicle. After dissection of the renal vein and artery the ureter is dissected from the level of the iliac vessels upwards within the periureteral sheath along with the gonadal vessels, in an attempt to preserve its vascularity. The kidney is then finally mobilized all around and the ureter transected. A midline peri-umbilical, extraperitoneal incision is made (to prevent the loss of pneumoperitoneum) prior to the ligation of the vessels. This helps in rapid retrieval of the organ after ligation of the vascular pedicle.

The vascular pedicle is ligated using a linear stapler. The kidney is removed through the short midline incision after incising the peritoneum, immersed in iced saline solution and perfused with cold perfusion fluid.

As advocated by Sasaki et al the risk of complications can be minimized by

1. Identifying the correct plane between the mesocolon and retroperitoneal structures by tracing the gonadal vein as it crosses the iliac vein to the renal vein.
2. Keeping the ureter-gonadal vessels complex intact throughout the length of the graft ureter in order to prevent the risk of ureteral ischemia
3. Confine renal vein dissection medial to the gonadal and adrenal vein origin so as to prevent injury to the renal pelvis
4. Transect the lateral attachments and the ureter after the pedicle is free. This minimizes the likelihood of torsion of the renal pedicle and urine is kept out of the field.

Conversion to open surgery may be indicated if there is uncontrolled bleeding, trauma to adjacent organs, difficult anatomy, renal ischemia during the procedure
and prolonged dissection time

Retroperitoneal procedure:

The preparation for the patient is similar to the transperitoneal procedure and the patient is positioned in the standard kidney position. A 2cm incision is made a little below and posterior to the tip of the 12th rib down the thoracolumbar fascia into the retroperitoneal space and the retroperitoneal space created using blunt finger dissection. As with the transperitoneal approach the patient is kept volume expanded and the retroperitoneal space is insufflated to a pressure of 15cm of water this is in order to ensure good renal blood flow. The second 10mm cannula is introduced in line with the first port, a little above the iliac crest in order to avoid hindrance to the maneuverability of the cannula by the bone. A third 10-mm cannula is inserted under vision, in the midaxillary line two centimeters below the costal margin. During insertion of this third port, special care needs to be taken to prevent the trocar from traversing the peritoneum. A fourth port is inserted posteriorly later in the procedure. Initially the kidney is mobilized within the Gerota's fascia, which is then incised posteriorly, and the renal pedicle is dissected starting posteriorly. The renal artery and vein are freed from their adventitial attachments. The ureter is mobilized within the periureteral sheath along with the gonadal vessels. The rest of the kidney is dissected free from within the Gerota's fascia. Prior to transection of the ureter and the ligation of the renal vascular pedicle the primary port site incision is enlarged as for a flank incision down to the thoraco-lumbar fascia, so that following ligation the kidney can be delivered with minimum delay. Once the kidney is freed all around and the ureter transected the pedicle is ligated and the kidney delivered. Mannitol, fursemide and heparin are given as in all cases of donor nephrectomy. It is important to dissect the kidney completely without undue traction on the renal pedicle. On the delivery of the kidney subsequent management is similar to that described for the transperitoneal route.

Postoperative Management:

The patient is transferred to the standard post-operative floor unless otherwise indicated. They are allowed a soft diet on the first post-operative day and are usually on a normal diet by the next day. The Foley catheter is removed on the first post-operative day. Most patients are fit for discharge by the third postoperative day.

RESULTS:

Several authors have published their series of the results of laparoscopic live donor nephrectomies. A review of experience with 201 live donor nephrectomies by Shaffer et al showed 4.5% major and 16.5% minor complication rate. Most of the major complications occurred during the early period of development of this procedure and included bowel injury, ureteral devascularization, retroperitoneal hematoma and epigastric arterial bleeding learning curve of most surgeons. Conversion to open nephrectomy often secondary to uncontrollable bleeding has been necessary in 5.7-8.3% of cases.

The overall performance of the allograft, measured by post-transplant serum creatinine, urine output, incidences of acute tubular necrosis, rejection episodes and ultimate graft survival appear to be similar to the kidneys obtained by open surgery.

POST-TRANSPLANT LYMPHOCELE

The other major indication of laparoscopic surgery is in the management of transplant patients is in the treatment of persistent lymphoceles. The reported incidence of lymphocele formation in recipients of renal allografts is of the order of 0.5% to 18.1%. Large and symptomatic lymphoceles may cause hydronephrosis, impaired renal function, ipsilateral leg swelling, edema overlying the graft, venous and arterial obstruction and infection. Routine postoperative ultrasound is the best method of detection of the lymphocele. The first line of management of symptomatic lymphoceles is percutaneous drainage. It is however associated with prolonged catheter drainage, risk of infection and protein loss from the lymph and a high recurrence rate (50-80%). Laparoscopic internal drainage of the lymphocele was first reported by McCullough et al in 1991. Since then the overall success rate of the procedure is around 88%.

The procedure of laparoscopic internal drainage of the lymphocele is done via the transperitoneal approach after the placement of a Foley catheter and nasogastric tube. Preoperatively the sac may be filled with methylene blue in order to delineate the lymphocele better at surgery. The ports are inserted at the umbilicus, right mid-clavicular line just below the umbilicus and the third port in the hypogastrium. After the lymphocele is identified as a bulge any adhesions over it are removed, its wall incised and the fluid aspirated. A part of the wall is then removed and the omentum fixed around the edge of the cavity. This procedure should be avoided if the lymphocele is infected.

Injury to the transplanted ureter can occur during the procedure especially if the lymphocele is located posteriorly and inferiorly.

VI. Complications

There are few complications which can be encounted during laparoscopic procedures. Subcutaneous emphysema, pneumomediastinum, pneumopericardium, pneumothorax may result because of the need for CO_2 insufflation for these procedures.

Gill et al (1995) reviewed the complications of laparoscopic nephrectomy done between June 1990 and July 1993 at 5 centres of USA. The procedure was done in 185 patients. A total of 30 patients (16%) had 34 complications. Access related complications included 2 cases of hernia formation at the trocar site, abdominal wall hematoma and 1 trocar injury to a hydronephrotic kidney. Intraoperative complications included 5 cases of vascular injury, 1 splenic laceration and 1 pneumothorax. Postoperative complications involved the gastrointestinal tract in 6 cases, cardiovascular system in 6, genitourinary tract in 4, respiratory system in 4 and musculoskeletal system in 2. Miscellaneous complications occurred in 3 patients. Open surgical intervention was required electively in 8 patients and on an emergency basis in 2. The incidence of complications decreased with experience 71% occurred during the initial 20 cases at each institution.

In our series of 356 patients who underwent various laparoscopic procedures at our Institute, there were 11.4% complications rate and 11.1% conversion rate, which includes our initial learning curve and wrongly chosen cases such as xanthogranulomatous pyelonephritis, genitourinary tuberculosis, medially located pelvic kidneys severe pyonephrosis with dense perirenal adhensions due to urolithiasis. Peritoneal rents during port placement occurred in 13 (5.4%) patients. Excessive bleeding occurred in seven patients. The causes were common iliac artery injury, slipped clip from the renal venous stump, injury to gonadal vessels and trocar injury to renal vein. Only two patients with gonadal vein injury could be managed endoscopically and the other five patients required conversion to open surgery. Seven patients had persistent fever in the postoperative period. The cause of fever was a retroperitoneal collection in three patients while the other four had pleural effusion, basal atelectasis, subcutaneous abscess at the port site and urinary tract infection. One patient developed a port site hernia following nephrectomy for a pyonephrotic kidney.

VII. Conclusions

Laparoscopic urologic surgery has advanced from ablative to reconstructive surgery. Though, only few centres are doing these procedures worldwide but gradually picking up all over. More advanced laparoscopic procedures like pyeloplasty, Ileal loop conduit and other urologic bowel surgery are being done by only few surgeons. However, these techniques are being adopted more widely now. It is also important to evaluate these procedure as what is possible laparoscopically does not mean it is reasonable. Before taking up these procedures, one should be properly trained and does require patience and skill as learning curve is often steep and long. Thus, it is evident that there is substantial scope of laparoscopic urologic surgery. The time is ripe for the urologist to learn and practice this art of surgery. With the skills of endoscopic surgery and experience of endovision camera. I for one don't see any reason, that why urologist cannot take up laparoscopic surgery. Dedication, training, perserverance are required. The next century is going to be an era of minimally invasive surgery, therefore not to miss opportunity to learn this new art to benefit your patients .

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Suggested Book reading:

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