Manual of
3D Laparoscopy and Operative Oncology

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Content

1. **Evolution of Endovision** 1
   B Ramesh, B Dhivya
2. **Gynecological Malignancy and Laparoscopy: Yesterday's Contraindications are Today's Indications** 11
   Dipak Limbachiya
3. **Surgical Anatomy of Uterine Cervix** 15
   Bhupesh Kumar Goyal
4. **Preoperative Workup of the Patients for Gyne-Oncology Surgery** 32
   Rama Joshi
5. **Venous Thromboembolism in Gynecological Cancers** 36
   Geeta Nagasree
6. **Para-Aortic Lymphadenectomy in Gynecologic Malignancies** 42
   Somashekhar SP
7. **Diaphragm Stripping and Resection in Ovarian Cancer** 45
   Somashekhar SP
8. **Gyne-Oncology Surgery: Metaplastic Thoughts from Benign to Malignant** 51
   Sabhyata Gupta, Shradha Chaudhari
9. **Peritonectomy in Ovarian Malignancy** 54
   Brig Manash Biswas
10. **Postoperative Follow-Up after Gynecological Cancers: The Necessary Guidelines** 63
    Rupinder Sekhon, Jiten Jaipuria

Chapter 2

Gynecological Malignancy and Laparoscopy: Yesterday's Contraindications are Today's Indications

Dipak Limbachiya

INTRODUCTION

Since the introduction of the laparoscope by Jacobaeus in 1910, its usefulness in the surgical arena has been met with skepticism by traditional surgeons. Despite the skepticism, potential advantages afforded by this minimally invasive technique motivated the development and evaluation of the laparoscope in an expanding number of surgical applications. Attempts to integrate laparoscopic techniques into the treatment of patients with gynecologic malignancies were met with an appropriate demand to show feasibility and then equivalency to traditional surgical approaches. The first case of laparoscopic staging of ovarian cancer was reported in 1975. Subsequently many others used the laparoscope as a diagnostic tool in second-look operations. The slow integration of laparoscopy into gynecology oncology, other than as a diagnostic tool, was because of the belief that radical surgery could not be performed adequately or safely. Other factors that discouraged the use of laparoscopy among gynecologic oncologists were the inability to completely evaluate the abdominal cavity due to adhesions from previous operations, the loss of tactile sense, and technical concerns such as the ability to control hemorrhage during radical surgery and lymph node dissection. Despite these concerns, many pioneering surgeons have shown the feasibility of using a minimally invasive approach in the treatment of women with gynecologic malignancies. Initially, the role of laparoscopy was limited to staging procedures. Dargent in 1987 was the first to propose the use of the laparoscope to evaluate the lymph node status, and subsequently many others reported their experiences performing laparoscopic pelvic lymph node dissections. Since then, laparoscopy applications have broadened, and instrumentation and surgical techniques have been refined.

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LAPAROSCOPIC LYMPHADENECTOMY

Currently, advanced laparoscopic techniques are used to evaluate and treat cervical, endometrial and ovarian malignancies. Assessment of the invasion of the pelvic lymph nodes is a part of the staging process for these gynecological cancers. In most cases, imaging techniques cannot reliably evaluate lymphatic spread. Endoscopy offers a satisfactory means of determining the surgical stage of the disease. Pelvic lymphadenectomy can influence the therapeutic strategy, especially when a combination of treatments is proposed. Endometrial carcinoma staging requires resection of pelvic as well as para-aortic lymph nodes. The concern regarding laparoscopic lymphadenectomy is that thoroughness of dissection is not equivalent to that performed with a laparotomy. But this is of little question nowadays because of advances in technology like advent of advanced energy sources and development of 3D vision, better training and experience, which has allowed the surgeon to define retroperitoneal anatomy and complete a thorough pelvic and para-aortic lymph node dissection. Laparoscopic lymphadenectomy is one of the milestones achieved in the field of gynecological oncology as the staging and radical surgeries would stay incomplete without lymphadenectomy.

Ovarian Carcinoma

Laparoscopic surgical staging of ovarian cancer offers a number of clearly defined benefits when compared with laparotomy. Although limited, the retrospective literature examining staging for ovarian cancer confirms that the laparoscopic approach is associated with decreased estimated blood loss, shorter hospital stay, quicker return of bowel function, and shorter interval to adjuvant chemotherapy administration.

The potential pitfall is the intraoperative rupture of a malignant mass, resulting in upstaging and potentially worsening the prognosis. Therefore, it is important to make every effort to identify malignant masses before surgery, to appropriately inform and consent the patient before proceeding to exploratory laparotomy or laparoscopy. Initially laparoscopy was contraindicated because of larger sizes of ovarian masses and the risk of rupture and spillage during their retrieval. But now laparoscopy is not contraindicated, based on the risk of intraoperative rupture, as even laparotomy does not eliminate that risk nor has it been shown in a prospective fashion to even reduce it. Moreover, laparoscopy offers a unique advantage in removal of ovarian masses that are adherent posteriorly and in POD. The creation of pneumoperitoneum offers a space for dissection and adhesiolysis. Manual handling of such ovarian masses during laparotomy poses greater risk of rupture and tumor spread at the time of adhesiolysis and retrieval.

Other concern with large ovarian masses was their retrieval from abdominal cavity. But with the advent of meticulous surgical techniques and endobags, this limitation has been overcome to a large extent. The specimen after its separation from the uterus can be retrieved out by putting it in an endobag

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and using a minilap incision. Endobags should be used to prevent spillage of the cyst fluid content into the abdominal cavity. In cases in which the mass is too large or adherent to perform the resection without rupture, a transvaginal colpotomy may be used either to remove the intact mass or to rupture and decompress the mass while minimizing the risk of intraperitoneal spill. Using this approach, cases of successful removal of a dermoid cyst with a mean diameter of up to 10 cm have been reported.

Nowadays, laparoscopy is being used routinely for primary staging of ovarian cancers. The ability to do pelvic and para-aortic lymph node dissection as well as omentectomy to a satisfactory level using the laparoscopic approach have played a major role in shifting the mode of surgery from laparotomy to laparoscopy.

Endometrial Carcinoma

Gynecologic surgeons have been reluctant to opt for the laparoscopic approach for endometrial cancer because of following concerns. However, with the advent of new techniques and acquirement of superior surgical skills, these troubleshooters have been effectively dealt with.

First, the increased intra-abdominal pressure from CO_2 required to maintain pneumoperitoneum for a prolonged period during the operation may increase the risk of metastasis (so called port site metastasis). However, port site metastasis is estimated to occur among just over 1% of women undergoing laparoscopy for gynecological malignancy. Studies have shown this incidence to be nearly the same as that found with laparotomy scar metastasis. On the contrary, the CO_2 gas facilitates dissection by delineating tissue planes.

The other factor which might influence the slightly reduced incidence of laparotomy scar metastasis is the application of radiotherapy over the scar area as an adjuvant therapy following surgery. The incidence of port site metastasis has been shown to be reduced if the area of radiation is extended upto the port sites.

Second concern was that laparoscopic hysterectomy requires substantial manipulation of the uterus, which may increase the risk of tumor spillage and consequent dissemination. A myoma screw used to manipulate uterus to facilitate dissection may cause disruption of the cavity and disseminate tumor cells into the vagina or through fallopian tube. To overcome this, a uterine manipulator inserted per vaginam must be used.

Third issue of concern was that at the completion of laparoscopic hysterectomy, the uterus must be delivered through the vagina. Excessive manipulation, particularly of large uterus, may disrupt the wall of uterus and result in tumor spillage. But studies have demonstrated that this does not promote tumor spread. Otherwise how can hysteroscopic D&C which directly spreads the tumor cells to the intraperitoneal cavity through the distention media used via the fallopian tubes, considered the gold standard for diagnosing endometrial carcinoma. Moreover, conventional D&C which involves scrapping of endometrium also disrupts the uterine wall. However,

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to eliminate even this meager theoretical risk of tumor spread, the specimen must be retrieved in an endobag and then removed vaginally.

Fourth concern was the adequacy of pelvic and para-aortic lymphadenectomy. This expertise has been effectively acquired with advanced technology, experience and skills.

Cervical Carcinoma

Open radical hysterectomy had been considered the treatment of choice for early stage cervical cancer for years. In recent years, vaginal radical surgery combined with laparoscopic pelvic lymphadenectomy for early-stage cervical cancer has gained recognition in the field of oncology. Still total laparoscopic radical hysterectomy took time to gain its place because of the belief that complete parametrectomy cannot be accomplished through laparoscopy. Doubts had been raised that the thoroughness of dissection is not equivalent to that performed with laparotomy. But studies over time have proved that complete satisfactory parametrectomy can be done in an equally good way by laparoscopic approach. Despite the proven advantages of minimally invasive access for cervical cancer surgery, postoperative and long-term morbidity are considerable with regard to bladder, bowel, and sexual dysfunction due to damage of the pelvic autonomic nerves during radical hysterectomy. Nerve-sparing techniques have been introduced to preserve these structures. Identification and conservation of the inferior hypogastric plexus results in significantly less bladder dysfunction and improved sexual results, and therefore should be a mandatory approach in order to reduce surgical morbidity. Magnification during laparoscopy facilitates identification of these neural structures with measurable impact on bladder function. This offers a clear cut advantage of offering laparoscopy over laparotomy to patients with early stage cervical cancer.

CONCLUSION

Laparoscopy is selectively adopted for the management of apparently early stage disease, defined as organ-confined cancer with no evidence of gross metastatic disease, and based upon preoperative imaging studies or laparoscopic inspection.

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