

The Patient with Ovarian Cancer: *Diagnosis, Treatment, and Nursing Management of Postoperative Complications*

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Diagnosis, Treatment, and Nursing Management of Postoperative Complications

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Ovarian cancer has been called “the disease that whispers”.¹ Because there are no useful screening tools and no specific symptoms, 75% of women with ovarian cancer are diagnosed at advanced stages. Ovarian cancer accounts for a full one-third of all gynecological cancers but results in over 50% of deaths from those cancers. In the year 2001, about 23,400 women were diagnosed with ovarian cancer in the USA and approximately 13,900 women died.²

Today, most women with ovarian cancer will achieve remission – even those with advanced disease on diagnosis. However, most ovarian cancer will recur. Improvements in surgical techniques and new chemotherapy agents are the primary reasons for remission. From 1970 to 2001, median survival improved from 12 to 36 months.³

Etiology

There are three types of ovarian cancer. Over 90% are epithelial tumors, arising from the cells that line most of the ovary. It is most common in older women. The other two types of ovarian cancer are germ cell and stromal tumors. These tumors are relatively rare and occur in younger patients.¹ This article will only discuss epithelial tumors of the ovary.

Ovarian cancer spreads by three routes: direct extension into the peritoneal cavity, via the lymphatic system, and by the bloodstream. Direct extension into the peritoneal cavity occurs as “seeding” into the areas bathed by peritoneal fluid: liver, diaphragm, bladder, spleen, and intestines. About 85% of patients with ovarian cancer present with ascites as a result of peritoneal irritation from this seeding.⁴

Symptoms

Ovarian cancer has no specific symptoms. Vague symptoms, such as gas, nausea, indigestion, frequent or urgent urination, unexplained changes in bowel habits, abdominal fullness or bloating, and ongoing fatigue are often ignored by women as not being serious enough to warrant medical evaluation. These signs and symptoms may be attributed to other conditions and diagnoses. Many patients have no symptoms at all. Some claim that they just “haven’t felt right” for some time.¹

Risk factors

The primary risk factor for the development of ovarian cancer is increasing age. The median age at diagnosis is 62 years. About 80% of patients who are diagnosed are postmenopausal. Older women generally have the most aggressive forms of ovarian cancer.⁴

Other risk factors seem to be related to the overall number of ovulatory cycles that a woman experiences, such as early menarche, nulliparous or first child after the age of 30, menopause after the age of 50, and lack of the use of birth control pills. The ovulatory-cycle theory states that, when the ovary repairs itself after each ovulation, genetic mutations can occur. These mutations eventually cause the cells to become cancerous.^{1,5}

The use of fertility drugs has been listed as a possible risk factor. Genetic and familial risk factors include a personal or family history of breast, ovarian, endometrial, or colon cancer. The presence of inherited BRCA1 and BRCA2 gene mutations may be associated with an increased risk of ovarian cancer.^{1,4} The study of these genetic tendencies and alterations is still under development. There are ethnic differences in the incidence of ovarian cancer around the world and even in the different ethnic communities of the United States. In general, whites have the highest incidence of ovarian cancer, followed by African Americans and Asian Americans.⁴

Diagnosis

The diagnosis of ovarian cancer involves the detection of key signs and symptoms as well as selected diagnostic testing. A definitive diagnosis is made through the use of exploratory laparotomy.

Key signs and symptoms

The most characteristic sign of ovarian cancer are ascites, which develop in response to tumor irritation of the peritoneal lining. A bimanual pelvic exam allows palpation of the vagina, uterus, and ovaries. An ovarian mass is relatively immobile or irregular. A normal-sized ovary in a postmenopausal woman is cause for concern, because ovaries shrink with aging and postmenopausal status.

Diagnostic testing

The best method for evaluating the ovary is an ultrasound exam.^{4,6} Serum CA-125 may be elevated, but the non-specificity of this test limits its usefulness. The diagnosis of ovarian cancer is only suggested by the presence of an abnormal pelvic exam, abnormal findings on a transvaginal ultrasound, and an elevated CA-125. An exploratory laparotomy is required for definitive diagnosis.⁴

Exploratory laparotomy

Surgical exploration is performed first to determine the diagnosis and to evaluate the extent of disease. The surgical staging laparotomy is extensive and is the single most important factor in giving physicians information to select the appropriate management options of early-stage disease. Table 1 reviews the components of the staging laparotomy. The extent of lymph node dissection in early-stage ovarian cancer is controversial, but if dissection is performed in advanced stages, it includes pelvic and aortic lymph nodes.^{7,8}

During the exploratory (or staging) laparotomy, the surgeon has two surgical options: perform the standard total abdominal hysterectomy and bilateral salpingo-oophorectomy or perform a procedure to spare the uterus and contralateral ovary in order to preserve fertility. Fertility-preserving surgery is controversial and is reserved for younger patients who may have early-stage vs. late-stage ovarian cancer.^{7,8}

Table 1. Comprehensive staging laparotomy of suspected early ovarian cancer

- Vertical incision that allows adequate visualization and palpation of structures in the upper abdomen and retro peritoneum
- Peritoneal washings (Pelvis, paracolic gutters, hemi diaphragms)
- Inspection/palpation of all peritoneal and mesenteric surfaces
- Biopsy of any lesions or adhesions
- Total abdominal hysterectomy and bilateral salpingo-oophorectomy
- Intracolic omentectomy
- Random peritoneal biopsies (bladder, cul-de-sac, bilateral pelvic peritoneum, paracolic gutters hemi diaphragms)

- Pelvic and para-aortic lymphadenectomy (inspection and palpation only are inadequate)
- Appendectomy (optional)

From Boente, Chi and Hoskins. The Role of Surgery in the Management of Ovarian Cancer: Primary and Interval Cytoreductive Surgery. Seminars in Oncology 1998;25,(3). Permission to reprint granted from W.D. Saunders

Treatment

Treatment of ovarian cancer depends on the extent of metastasis at the time of diagnosis. Chemotherapy, radiation, and surgery form the cornerstones of care for the patient with ovarian cancer.

Chemotherapy

Current chemotherapy modalities greatly increase the likelihood of remission but do not prevent recurrence. Ovarian cancer is highly sensitive to chemotherapy, which treats any disease that remains after surgery. Today, two agents are used together as first-line chemotherapy: cisplatin (or carboplatin) and Taxol. Carboplatin is often used instead of cisplatin, as it is more easily tolerated.

The nurse administers chemotherapy drugs intravenously over several hours in an outpatient setting. Each time the drugs are given is called a cycle. Cycles are repeated about every 3 weeks for a total of 6 cycles.¹⁴

In addition to chemotherapy, other drugs may be used for recurrent disease. Approximately 15 different chemotherapy drugs are active in the treatment of ovarian cancer (Table 2). Typically, if the disease is not arrested with one drug regimen, another is given.

Measuring the serum CA125 level monitors disease progression. If the level decreases, the chemotherapy regimen is considered successful in disease control. If the level rises, the physician may switch to another regimen.⁴

Radiation

After surgery, radiation therapy may be used to treat any remaining local disease. Radiation therapy is given either by external beam or by placing radioisotopes into the peritoneum. External beam radiation therapy is only appropriate for early-stage disease with remaining localized disease. It requires daily treatment of the entire abdominal cavity and pelvis. It has significant toxicity and side effects, including severe nausea and vomiting, diarrhea, dysuria, and anorexia.

Table 2.	Drugs for treatment of ovarian cancer
	Carboplatin
	Cisplatin
	Cyclophosphamide
	Docetaxel
	Doxorubicin
	Epirubicin
	Etoposide
	5-Fluorouracil
	Ifosfamide
	Melphalan
	Methotrexate
	Mitoxantrone
	Paclitaxel
	Thiotepa
	Topotecan
	Vinorelbine

Radioisotope therapy involves the placement of a low-dose radioisotope, such as phosphorus-32, in a suspension that is injected into the peritoneal cavity. The use of this therapy is still investigational.⁴

Surgery

Surgery is the cornerstone of management of ovarian cancer. It has broad application throughout the clinical course of disease, from initial diagnosis to palliative care.⁹ Nurses need to recognize that, for ovarian cancer, surgery is primarily a treatment of control and, only rarely, cure. In addition to the physical concerns of postoperative healing, nurses play a vital role in the patient's psychological adaptation and quality of life relative to ongoing treatment and care.

Cytoreduction surgery. Maximal cytoreduction at the time of the initial staging laparotomy is beneficial in even the most advanced stages of ovarian cancer. This procedure is the primary reason for the marked improvements in median survival rates over the past 35 years. Postoperative tumor burden (size) measurement criteria of less than or equal to 2 cm is considered maximal or optimal. Reduction of tumor burden to 2 cm or less may decrease the number of chemotherapy cycles required to achieve clinical remission, improve gastrointestinal function, and improve performance status and quality of life. The surgeon balances these benefits with the possibility of increased postsurgical morbidities, including prolonged recovery time.^{7,8}

The nurse must be aware that patients with a larger initial tumor burden will require more extensive and lengthy surgery, involving many organs in the peritoneal cavity and resulting in the need for increased diligence, surveillance, and care in the immediate postoperative setting.

Secondary cytoreductive surgery may help to enhance the effectiveness of additional chemotherapy in some patients at the time of large tumor recurrence. Ovarian cancer cells develop multiple-drug resistance to chemotherapeutic agents and the surgical removal of most of these resistant cells improves responses to additional chemotherapy.

Debulking surgery. Patients whose tumors cannot be optimally cyto-reduced by surgery may be candidates for interval debulking surgery after three cycles of chemotherapy. This second attempt to remove tumor mass improves the median survival time for these patients.⁷ As chemotherapy cycles are generally 3 to 4 weeks in length, these patients will undergo two major abdominal surgeries in less than 4 to 5 months.

Palliative surgery. Surgery for the palliation of symptoms from gastric outlet obstruction to small- or large-bowel obstructions may be helpful in improving quality of life by relieving or bypassing the obstruction. Gastric outlet obstructions are managed with the placement of a gastric tube either endoscopically, under radiographic guidance, or surgically. Small-bowel obstructions can be managed surgically with a resection or bypass procedure; colonic obstructions may require a diverting or loop colostomy. These patients tend to be severely debilitated from prolonged chemotherapy, multiple

abdominal surgeries, and poorer renal function, related to the chemotherapy regimen. This debilitation results in a postoperative morbidity as high as 32%.⁷

Postoperative Complications

Patients undergoing a staging laparotomy are usually hospitalized for 5 days. More extensive tumor burdens necessitate more extensive surgery and longer postoperative recovery times. Major complications include fluid and electrolyte imbalance, abdominal distention and prolonged ileus, pulmonary infections, wound infections, urinary tract infections, and pain. Deep vein thrombosis, a risk for any major surgical procedure, is a consideration for the postoperative ovarian cancer patient.

Nursing care in the immediate postoperative time focuses on both prevention and early recognition of complications, management of pain, return of the patient to full ambulation, and resumption of oral intake of food and fluids.¹⁰

Fluids and electrolytes. Fluid and electrolyte management is an essential part of nursing care. Fluid shifts and third spacing of fluids are related to the length of surgery, removal of large amounts of ascitic fluid, and blood loss during surgery. Nursing interventions may include accurate fluid volume measurement, monitoring of electrolyte status, replacement with albumin and electrolyte-rich fluids, and blood transfusions.

Some patients will require very close hemodynamic monitoring in the immediate postoperative period and will have central venous catheters in place. Other patients will receive intravenous therapy peripherally. In both cases, the nurse pays meticulous attention to intravenous site inspection for signs or symptoms of phlebitis or extravasations. Multiple peripheral sites may be required to administer the prescribed intravenous therapy, requiring the nurse to be aware of potential drug interactions and compatibilities with the prescribed intravenous medications and fluids.

Pulmonary. Basic nursing interventions are key in the prevention of postoperative complications. The nursing assessment includes thorough lung auscultation with assessment for adventitious or diminished breath sounds, monitoring of vital signs (blood pressure, respirations, and temperature) every 2 to 4 hours, and monitoring blood counts, electrolytes, and other laboratory results.

The application of an abdominal binder ([Dale Medical Products](#), Plainville, MA) as well as incentive spirometer will encourage the patient to cough and deep breath which will help to reverse atelectasis and prevent pneumonia. The nurse teaches and assists patients with coughing and deep breathing and the use of the incentive spirometer (q 1 to 2 hours).

Wound infection. Ovarian cancer patients are particularly vulnerable to developing wound infections. Abdominal incisions are large and extend from the symphysis pubis to the epigastrium.⁷ Healing of these incisions is particularly compromised in patients who have ascites. Although the peritoneal fluid is removed during surgery, continued irritation

to the peritoneal lining may result in continuous production of fluid. This ascitic fluid can leak from the wound site and around drains, causing skin irritation and delayed healing.

The nurse assesses the incision and surrounding skin for signs and symptom of infection, monitors vital signs closely, and administers intravenous antibiotics as ordered. It is critical to record the drainage amounts and characteristics from any dressings and drains. To help prevent accidental pull-out of drainage bulbs the clinician may apply a Velcro®-type drainage bulb holder (Fig. 1, [Dale Medical Products](#)).



Fig. 1

In addition to the presence of irritating fluids on the skin's surface, the skin's integrity may be compromised by the application of various tapes and topical agents. The use of abdominal dressings or Velcro® abdominal binders ([Dale Medical](#), Plainville, MA) that minimize the need for tape will help to protect the skin and make dressing changes less time-consuming and cumbersome.

The nurse teaches the patient and assists with splinting of the abdomen with coughing, deep breathing, and position changes to help to reduce the possibility of wound dehiscence and to help alleviate pain. An abdominal binder will splint the abdominal incision and give the patient the confidence to sit up in bed, ambulate and follow clinicians' orders to cough, turn and deep breathe. Close nursing surveillance for any subtle changes in the patient's condition enables early medical intervention.

Urinary tract infection. Urinary catheters are placed in the operating room. They are typically left in place for a minimum of 48 hours. Urinary output is monitored at least every 8 hours as a measure of fluid balance. The nurse secures the drainage tubing with a commercial Velcro® catheter holder ([Dale Medical](#), Plainville, MA) to help to reduce meatal friction that may lead to urinary tract infection, as patients are moved and ambulate. Fluid intake is encouraged to prevent urinary stasis, another cause of urinary tract infection.

Pain. A patient's ability to participate in her postoperative care requires appropriate and aggressive pain management. Postoperative pain is most acute in the first 24 to 48 hours after surgery. In the post-laparotomy patient, pain is most often managed intravenously, via patient-controlled analgesia (PCA).

Intravenous narcotic analgesics are used for pain control during the first several days postoperatively. Oral narcotic and non-narcotic analgesics are started once the immediate postoperative pain intensity has been controlled.

A complete and thorough pain assessment by the nurse is absolutely necessary and includes pain intensity measurement on a standardized rating scale, pain location, and the patient's description of the pain in a systematic and around-the-clock method.¹⁰ By recording these results, the nurse is able to assess the effectiveness of the prescribed pain regimen and work with the surgeon in making necessary adjustments to enhance patient comfort.

Deep vein thrombosis. Postoperative cancer patients are at a higher risk for developing deep vein thrombosis and pulmonary embolus. The nurse will administer low-dose anticoagulants and assist the patient to walk early in the postoperative period as preventive measures. The nurse will teach the patient about regular position changes, range of motion exercises, and the use of antiembolism stockings or compression stockings to help prevent the development of venous stasis.

Long-term complications

Even with a smooth immediate postoperative recovery, the patient with ovarian cancer is at risk for the development of long-term complications, such as bowel obstruction, lymphedema, fistula formation, and ascites. These complications occur as a result of radiation treatments, surgical interventions, or tumor recurrence.

Bowel obstruction. Bowel obstruction is the most common late complication associated with abdominal surgery and can occur months or years after surgery. It is 4 to 5 times more common in patients treated with postoperative pelvic or abdominal radiation therapy. In addition, bowel obstructions may be due to tumor recurrence.

The nurse teaches the patient about the symptoms of bowel obstruction along with routine discharge instructions. These symptoms are abdominal pain, nausea and vomiting, abdominal distention, and the absence of bowel sounds.¹⁰ Educated and knowledgeable patients can help with the early diagnosis and intervention of bowel obstructions.

Lymphedema. Lymphedema is the gradual accumulation of protein-rich fluid in the interstitial spaces of an extremity, causing chronic inflammation and fibrosis in the surrounding tissue.¹⁰ Surgical resection of lymph nodes interferes with their normal pressure gradients and valve patency, allowing fluids and protein to leak into the surrounding tissue. Lymphedema causes pain, numbness, and decreased range of motion in the affected extremities.

Ovarian cancer patients whose surgery has involved lymph node dissection are at risk for lymphedema of the lower extremities and pelvis. The nurse teaches the patient about these risk factors as well as preventative measures, such as protection of the extremity from injury, friction, and trauma, as well as good skin care, which includes keeping the skin clean, dry, and well hydrated with emollients.

The nurse instructs the patient to watch for early signs and symptoms of lymphedema, such as erythema, warmth, and a feeling of tightness in the affected area.[10](#)

Fistula formation. The risk of developing fistulas increases with additional surgeries but may occur in any ovarian cancer patient, even as a delayed complication. A fistula is an abnormal opening between internal organs or between an organ and the exterior of the body. Most late fistulas are associated with recurrent cancer and usually begin in an area of necrosis, infection, or inadequate blood supply. Conversely, early fistulas are due to infectious complications. When possible, aggressive surgical management of the fistula is warranted. In late-stage ovarian cancers, this may be impossible, and nursing management of drainage and odor are the most important considerations. The nurse should refer these patients to the wound ostomy nurse, who will design an individualized treatment plan for the optimal management of drainage containment, odor, and protection of the surrounding tissues.[10](#)

Ascites. Ascites are indicative of advanced disease and are present in 85% of ovarian cancer patients, either at the time of diagnosis or after treatment failure. Paracentesis by either an implanted abdominal port that is surgically placed and accessed by a special needle or by intermittent placement of a paracentesis needle is the most common treatment. Additionally, the administration of diuretics and restriction of oral fluid intake and sodium are used to manage the fluid surplus.

Patient teaching about medication side effects, drug interactions, and the rationale for dietary changes are important nursing interventions. In addition, the nurse provides support and understanding for patients who often find it difficult to adhere to fluid and sodium restrictions.[10](#)

Psychosocial considerations

The psychosocial recovery of ovarian cancer patients is a long process and begins with postoperative healing. Quality of life improves with the reduction of anxiety. Education and encouragement can help to develop effective, new coping strategies and help the patient adjust to body-image changes.[4](#)

Patients and family caregivers grapple with many issues in the home-care setting: fatigue, pain, paresthesias of hands and feet, nausea and vomiting, bloating, constipation, anorexia, diarrhea, dyspnea, wound care, central-line management, and learning to administer antibiotics or total parenteral nutrition (TPN) at home.[10](#) Feelings of hopelessness, anticipatory anxiety, and loss of femininity are common psychological reactions.

Periods of disease-free survival may be short and chances of recurrence are high. Fewer than 50% of women with ovarian cancer will survive 5 years after diagnosis.[11](#)

Although most women do not plummet into depression after a diagnosis of ovarian cancer, some will have difficulty adjusting and will need additional support. Pain, fatigue,

insomnia, and impaired role performance all contribute to poor emotional well-being. Surgical menopause in women who were premenopausal prior to treatment may also contribute to psychological distress. The abrupt depletion of estrogen and androgens that occur as a result of oophorectomy places a woman at increased risk for depression.

Mood disturbance may be a side effect of chemotherapy medications.¹¹ Women who are placed on estrogen replacement therapy postoperatively have shown improvement in both mood and memory function.

At the completion of the final cycle of chemotherapy, patients often experience an increase in anxiety. The psychological effects of having ovarian cancer last for years, even when the disease is controlled. These effects include persistent fatigue, difficulty with self-concept, fear of recurrence, global uncertainty, and sexual dysfunction.¹¹

The nurse assists patients by actively listening to their concerns and feelings, locating appropriate resources, and assisting patients to connect with other ovarian cancer survivors in support-group settings, as appropriate.

Listening is an underrated nursing skill⁴ and often patients and their families need the nurse's time to voice their concerns, fears, questions, and feelings. Providing patients with resources, connections, and support outside the professional health-care team lessens their feeling of abandonment as medical treatments conclude.

Ongoing care

Knowing the long-term and far-reaching effects of both physical and psychological issues associated with ovarian cancer allows the nurse to provide care within a holistic framework. Much of the required care will occur long after the postoperative nurse discharges the patient from the acute care setting. Providing information about support groups, educational programs, and resources along with the routine discharge instructions will provide the patient and family with information when they need it. Ensuring contact and follow up with social workers, nurse case managers, or oncology nurses who will be administering chemotherapy helps to provide a continuity of care.

As the nurse remembers, listens, values, and practices compassionate caring, the ovarian cancer patient's long and difficult journey is eased.

Glossary of Selected Terms

BRCA1A

gene on chromosome 17 that normally helps to suppress cell growth. A person who inherits an altered version of the BRCA1 gene has a higher risk of breast, ovarian, or prostate cancer.

BRCA2A

gene on chromosome 13 that normally helps to suppress cell growth. A person who

inherits an altered version of the BRCA2 gene has a higher risk of breast, ovarian, or prostate cancer.

CA125A

substance sometimes found in an increased amount in the blood, other body fluids, or tissues that may suggest the presence of some types of cancer. Also called a tumor marker.

Cytoreduction

The reduction of the amount of cancer cells, generally via surgery.

Debulking

Surgical removal of as much of the tumor as possible.

Tumor burden

The size of the tumor or number of abnormal cells in the organ or tissue.

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